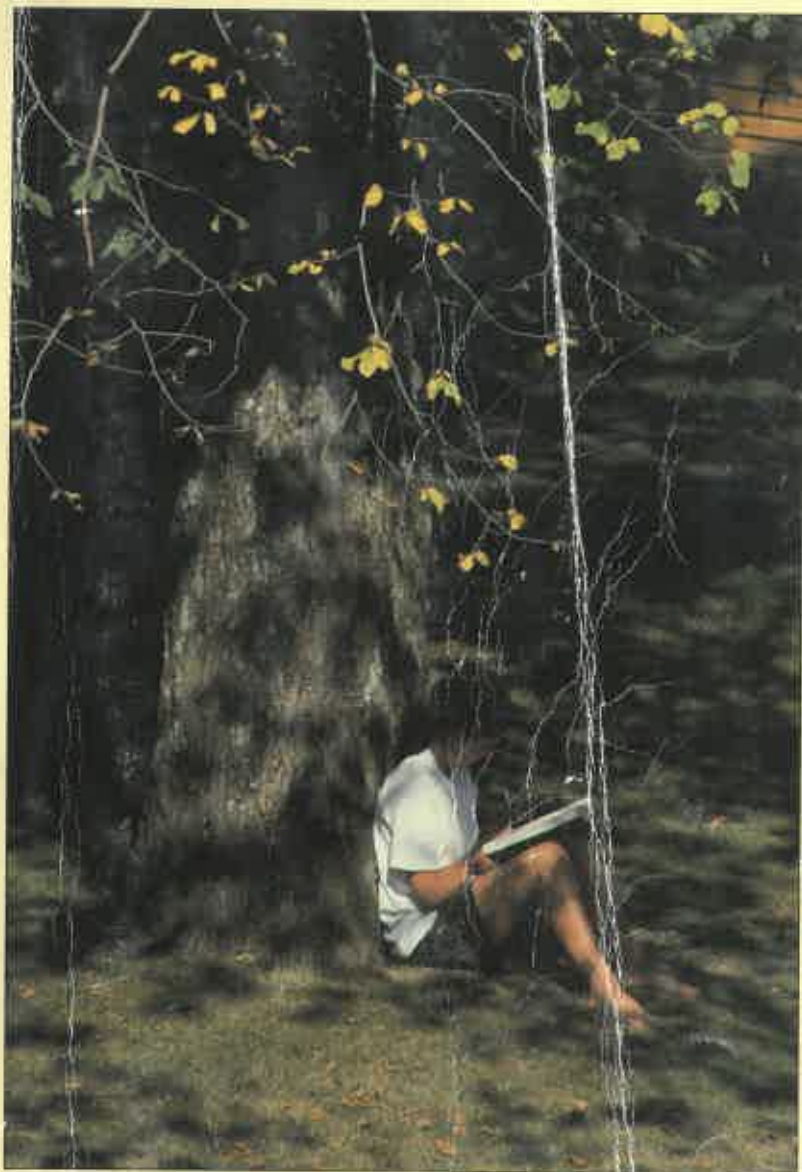


DALHOUSIE

UNIVERSITY



**ARTS & SOCIAL SCIENCES, EDUCATION,
HEALTH PROFESSIONS, MANAGEMENT,
AND SCIENCE CALENDAR**

1993/94

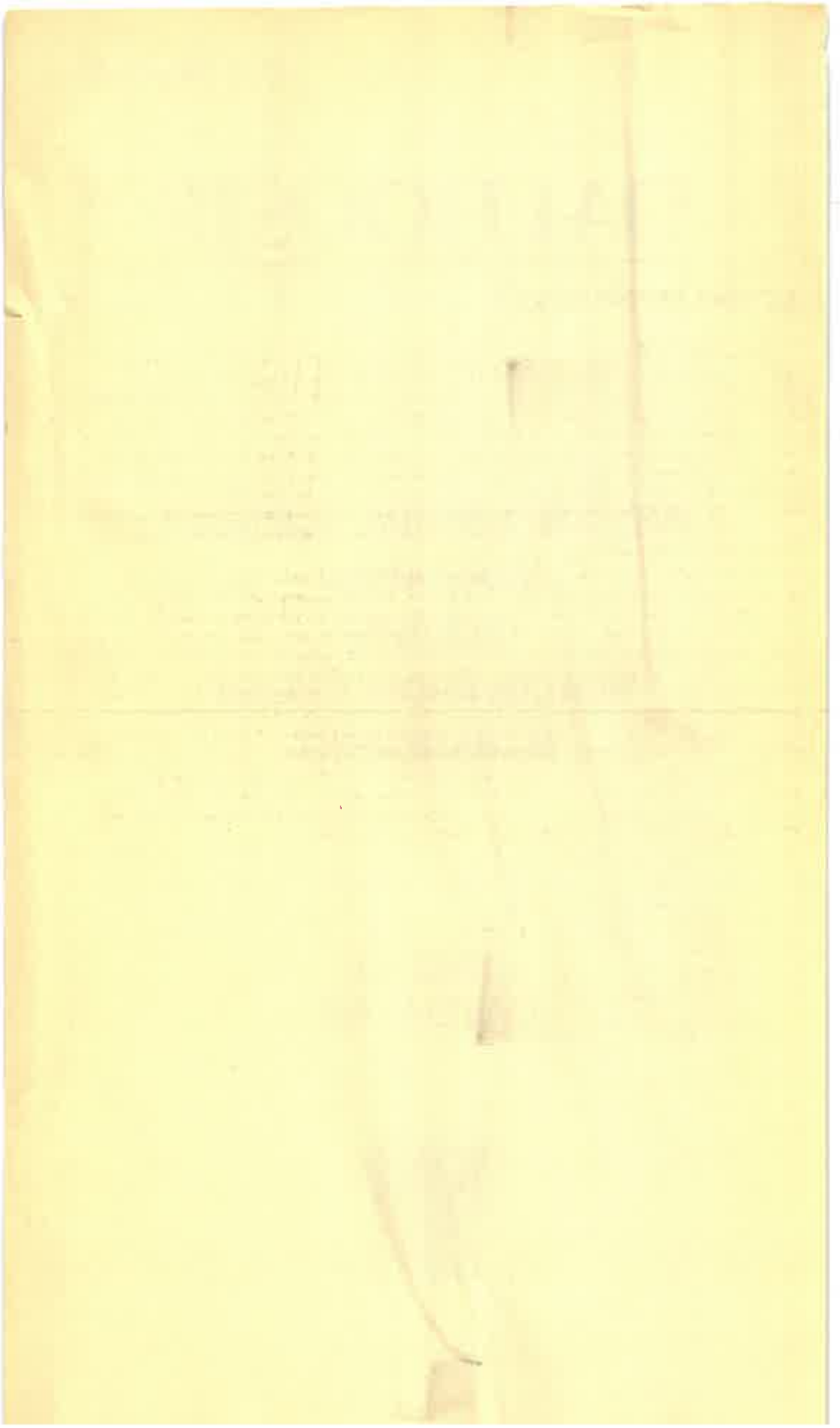
DALHOUSIE

U N I V E R S I T Y

**ARTS AND SOCIAL SCIENCES
EDUCATION
SCIENCE
HEALTH PROFESSIONS
MANAGEMENT**

**1993/94
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. 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

A Statement of the Aims of Undergraduate Education at Dalhousie

Dalhousie University offers undergraduate education enriched by a longstanding institutional commitment to research and to graduate and professional education. The University tries to assist all its undergraduate students to become independent thinkers and articulate communicators, knowledgeable about their chosen disciplines or professions, conversant with a reasonable body of general knowledge, and committed to learning throughout their lives.

Dalhousie assists its students to learn how to think for themselves. Students in all disciplines and professions can expect to develop skills and attitudes crucial for logical and independent thought. The faculty strives to teach students how to think, rather than what to think, and to enable them to make fair-minded enquiries in their fields of study and into the broader ethical, cultural and social issues that shape our lives. An educated person thinks carefully, reconsiders received ideas, and leads an examined life. The development of these habits of mind is the primary goal of undergraduate study.

Dalhousie assists its students to learn to express themselves, orally and in writing with clarity, precision and style. It does so, not only because communication skills permit the efficient transfer of information, but also because they make possible dialogues which lead to new ideas and to deeper appreciation of existing knowledge. Because a communal effort to exchange ideas and information is at the heart of university life, students in all disciplines and professions need opportunities to develop their skills in writing and in speaking at all levels of the undergraduate curriculum.

Dalhousie assists its students to master a combination of specialized and general knowledge. The specialized knowledge acquired by undergraduates at Dalhousie varies from discipline to discipline and even from student to student. Such knowledge should include, not only data and skills, but also an understanding of the theories, structures and processes central to the discipline or profession in question, and an awareness of their practical applications and ethical consequences. Undergraduate students at Dalhousie should become familiar with a significant body of general knowledge as well. All should become acquainted with concepts central to our own culture and those of others. All should acquire basic quantitative skills and some knowledge of the principles of science and technology. All should share a sense of history and an appreciation of achievements in literature, philosophy and the arts. Such general knowledge helps us not only to confront the practical demands of work and life, but also to comprehend more fully our experience of the human condition.

Dalhousie assists its students to develop the capacity for commitment to learning throughout their lives. Their educational experiences within and outside the classroom should be rich and diverse. By providing social, cultural, recreational and other opportunities for student involvement and leadership, Dalhousie acknowledges responsibility for promoting both personal and intellectual growth.

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Schedule of Academic Dates

1993-94

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 carry less than one full credit).

1993

May

- 3 Classes begin, Commerce Co-op Summer session
Level I fieldwork (second year, 4 weeks) and Level II fieldwork (third year, 8 weeks) begins, School of Occupational Therapy
- 5 Last day to register without late fee, Spring & Co-op Summer sessions
- 10 Classes begin, Spring session
Outpost Nursing Internship begins
- 14 Last day to cancel registration in or to add "A", "C" and "R" classes, Spring session
Last day to register with late fee, Spring session
- 18 Last day to cancel registration in or to add "C" classes Commerce Co-op Summer session
Last day to register with late fee, Commerce Co-op Summer session
- 19 Last day to withdraw without academic penalty from "A" classes, Spring session
- 24 Victoria Day - University closed
- 25-28 Spring Convocations
- 28 Last day to withdraw from "A" classes, Spring session

June

- 2 "A" classes end, Spring session
- 3 "B" classes begin, Spring session
- 4 Last day to withdraw without academic penalty from "R" and "C" classes, Spring session
- 9 Last day to cancel registration in or to add "B" classes, Spring session
- 14 Last day to withdraw from "B" classes without academic penalty, Spring session
- 18 Last day to withdraw from "R" and "C" classes, Spring session

- 18 Last day to withdraw from "B" classes, Spring session
- 21 Last day to withdraw from "C" classes without academic penalty, Commerce Co-op Summer session
- 25 Classes end, Spring session
- 30 Last day to register without late fee, Summer session

July

- 1 Canada Day - University closed
- 2 Last day to apply to graduate in October
Fieldwork Level III (8 weeks) begins, School of Occupational Therapy
- 5 Classes begin, Summer session
- 9 Last day to cancel registration in or to add "A", "C" and "R" classes, Summer session
Last day to register with late fee, Summer session
- 14 Last day to withdraw without academic penalty from "A" classes, Summer session
- 16 Last day to withdraw from "C" classes, Commerce Co-op Summer session
- 21 Last day to withdraw from "A" classes, Summer session
- 27 "A" classes end, Summer session
- 28 "B" classes begin, Summer session
- 30 Last day to withdraw without academic penalty from "R" and "C" classes, Summer session
Classes end, Commerce Co-op Summer session

August

- 2 Halifax/Dartmouth Natal Day - University closed
- 3 Examinations begin, Commerce Co-op Summer session
- 4 Last day to cancel registration in or to add "B" classes, Summer session
- 7 Examinations end, Commerce Co-op Summer session
- 9 Last day to withdraw from "B" classes without academic penalty, Summer session
- 10 Last day to withdraw from "R" and "C" classes, Summer session
- 13 Last day to withdraw from "B" classes, Summer session
- 16 Classes begin, Outpost Nursing
- 20 Classes end, Summer session

September

- 6 Labour Day - University closed
- 7 Classes begin, Outpost Nursing and Dental Hygiene
- 10 Last day to register without late fee, Regular session
First installment of fees due

2 Schedule of Academic Dates

- 13 Classes begin unless otherwise specified, Regular session
- 27 Last day to cancel registration in or to add "A", "C" and "R" classes, Regular session
 - Last day to register with late fee
 - Last day to apply for Honours Programmes

October

- 1 Last day to apply to graduate in February
- 11 Thanksgiving Day - University closed
- 16 Fall Convocation
- 25 Last day to withdraw from "A" classes without academic penalty
 - Last day to change "A" classes from credit to audit and vice versa
 - Last day for partial refund of first term fees

November

- 11 Remembrance Day - University closed
- 16 Last day to apply for admission to Winter term
 - Last day to withdraw from "A" classes

December

- 1 Last day to apply to graduate in May
- 7 Classes end
- 9 Examinations begin
- 18 Examinations end

1994

January

- 3 University closed
- 4 Last day to register, second term
 - Classes resume, second term begins
 - Fieldwork (4th year) begins, School of Occupational Therapy
 - Internship begins, Outpost Nursing
 - Classes resume, Outpost Nursing
- 17 Last day to cancel registration in or to add "B" classes, (except fourth year, Occupational Therapy)
 - Last day to withdraw from "C" and "R" classes without academic penalty
 - Last day to change "C" and "R" classes from credit to audit and vice versa
- 31 Last day for partial refund of regular session fees

February

- 4 Munro Day - University closed
- 14 Last day to drop "B" classes without academic penalty (except fourth year, Occupational Therapy)

Last day to change "B" classes from credit to audit and vice versa

Last day for partial refund of second term fees

21 Study break begins

28 Classes resume

Clinical practice, 4th year, begins, School of Physiotherapy

March

- 7 Last day to add "B" classes, 4th year, Occupational Therapy (except 4418B)
- 14 Last day to withdraw from "B", "C" and "R" classes (except fourth year, Occupational Therapy)
 - Last day to drop 4th year Occupational Therapy "B" classes without academic penalty (except OT 4418B)
 - Last day for partial refund of second term fees
- 21 Fieldwork Level II (8 weeks) begins, Occupational Therapy

April

- 1 Good Friday - University closed
- 8 Classes end, Regular session
- 13 Examinations begin, Regular session
- 25 Intra-session clinical practice begin, School of Nursing
 - Summer clinical practicum begins in the School of Physiotherapy, third year
- 27 Examinations end, Regular session
- 28 Last day to withdraw without academic penalty, three days after practicum begins, School of Physiotherapy

May

- 2 Summer clinical orientation, second year, (4 weeks) begins, School of Physiotherapy
- 24-27 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.

Academic sessions:

- Regular session: September - April
- First term: September - December
- Second term: January - April
- Spring session: May - June
- Summer session: July - August

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.

Corequisite: Requirement which must be fulfilled prior to or concurrently with the class being considered.

Course: The term "class" is used in place of the word course.

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 Students: Those registered for three full classes or more, or the equivalent of three half credit classes or more in either first or second term.

For definition for fee assessment see fee schedule.

Good Standing: Students who meet the required G.P.A. are in considered to be in good academic standing. (see Academic Regulation 19)

Grade Point Average (GPA): Weighted sum of the grade points earned, divided by the number of classes enrolled.

Seasonal GPA: Classes taken in a single session.

Cumulative GPA: All classes taken for credit in a faculty.

Matriculation Standing: Senior Matriculation designates the level of studies attained by students who have successfully completed Grade XII in public high school in Nova Scotia or its equivalent elsewhere.

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.

Part-time Students: Students registered for fewer than three full-credit classes or the equivalent of three half-credit classes in either first term or second term. A full credit class is equivalent to 6 credit hours.

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

Probation: Warning to students that their academic performance is unsatisfactory and that they will be dismissed from their programme unless their performance improves by the end of the next regular session. (See Academic Regulation 20)

Special Students: Students who are not candidates for a degree or diploma but who wish to take classes which may be allowed for credit. This is not the same as auditing a class. Special students must satisfy normal admission requirements.

Transcript: A transcript is a complete history of a student's academic record at Dalhousie. Partial transcripts, e.g. a portion of a student's record pertaining to registration in a particular degree or faculty only, are not issued.

Undergraduate: Students who are candidates for an undergraduate degree, diploma or certificate.

University Explorer: Students admitted under the mature students category who are not candidates for a degree.

Visiting Student: A person permitted to take classes at Dalhousie for transfer of credit to another university.

Course Codes

Numbers

- 1000 level classes are introductory
- 2000 - 4000 level classes are advanced level
- 5000 - 6000 level classes are Graduate level

Term Codes

- R - Sept. to April, Spring or Summer session
- A - Sept. to Dec. or first half of a Spring or Summer session
- B - Jan. to April or second half of a Spring or Summer session
- C - Sept. to April, Spring or Summer session (less than a full credit)
- 06 credit hours = 1 full credit
- 03 credit hours = 1/2 credit

Dalhousie University

For over 125 years, Dalhousie University has played a crucial role in Nova Scotia's 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, SoD, FRSC

Vice-Presidents

Academic and Research

Denis Stears, BA, MA, PhD, FRSC

Finance and Administration

Bryan G. Mason, BA

Student Services

Erio A. McKee, BA, MA

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Associate Vice-President Research

Robert O. Fournier, BSc, MA, PhD

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Arts and Social Sciences

Rowland J. Smith, BA, MA, PhD

Dentistry

William MacInnis (Acting)

Graduate Studies

Judith Fingard, BA, MPhil, PhD

Health Professions

Lynn McIntyre, MD, MHS, FRCPC

Law

Joseph A. Ghiz, BComm, LLB, LLM, LLD

Management

James D. McNiven, BA, MA, PhD

Medicine

John Ruedy, MDCM, FRCPC, FACP

Science

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Henson College of Public Affairs and Continuing Education

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School of Education

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College of Arts and Science

Rowland Smith, PhD, Provost

Administrative Officers

University Secretary and Legal Counsel

Brian C. Crocker, QC, BA, LLB

University Librarian

William F. Birdsell, 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
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Lester Pearson Institute
A.D. Tillett

Office of Institutional Affairs
Brian Christie, BSc, 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

Development
Charlotte Sutherland, BA, MEd

Environmental Health and Safety
William J. Louch, PhD

Financial Services
Ian Nason, BComm

Health Services
Joyce Curtis, MD

Housing and Conferences
Heather Sutherland, BSc, MEd

Personnel Services
Michael J. Roughneen, CIPR, 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. Rouben Cohen, QC, BA, LLB, LLD

Chancellor Emeritus
Lady Beaverbrook, LLD

Officers
Dr. Howard C. Clark, BSc, MSc, PhD, ScD,
President & Vice-Chancellor
Mr. Allan C. Shaw, Chair
Mr. James S. Cowan, Vice-Chair
Miss Barbara Walker, Vice-Chair
Mrs. Ann Petley-Jones, Honourary Secretary
Mr. Lawrence Doane, Honourary Treasurer

Members
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Dr. Marie Ann Battiste
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Dr. Mona L. Campbell
Dr. Fay G. Cohen
Mr. J. Dickson Crawford
Mr. Peter R. Doig
Her Worship Mayor Moira Ducharme (ex officio)

Dr. Kenneth A. Dunn
Mr. Fred Fountain
Mrs. Linda Fraser
Mrs. Cynthia Gorman
Dr. Margaret M. Haneell
Chief Justice T. Alex Hickman
Ms. Carolyn Johnson
Mr. Donald A. Kerr
Ms. Lale Kesabi
Dr. Patriola Lane
Mr. Thomas E.G. Lynch
Ms. Bernadette Macdonald
Mr. George W. MacDonald
The Hon. Jacqueline R. Matheson
Mr. Fraser Matte
Mr. Ralph M. Madjuok
Dr. Carmen F. Moir
Mr. Norman Newman
Dr. Sharon Oliver
Dr. Norman G.O. Pereira
Mr. George C. Pierosy
Mr. Peter Pottier
Mr. John C. Rieley
Dr. Cedric E. Ritchie
Mrs. Patriola Roscoe
Mr. Kenneth C. Rowe
Mr. Byron G. Searson
Dr. William M. Skerrett
Dr. Donald C.R. Sobey

6 Academic Programmes

Ms. Maxine N. Tynes
Mr. Robert Zed
Mr. Sherman Zwicker

Secretary

Elizabeth A. Merriok

Observer for Faculty Association

Dr. Tom Sinclair-Faulkner, BA, MTh, MA, PhD
(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

Kenneth A. Dunn, BSc, MSc, PhD

Vice-Chair of Senate

Raymond W. Carlson, BA, MSW, PhD

Secretary of Senate

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

Academic Programmes

Degrees, Diplomas, and Certificates

College of Arts and Science

Bachelor of Arts

Major 3 years, Advanced Major 4 years,
Honours 4 years

Bachelor of Science

Major 3 years, Advanced Major 4 years,
Honours 4 years

Bachelor of Education (Sequential)

1 year post BA, BM, BSc

Bachelor of Education (Integrated)

4 years for BA or BSc with BEd, 5 years
for BPE with BEd

Bachelor of Music

4 years

Bachelor of Music Education

4 years

Certificate in Costume Studies

2 years

Diploma in Costume Studies

3 years

Diploma in Engineering

2 years

Diploma in Meteorology

1 year

Faculty of Management

Bachelor of Commerce

Major and Honours 4 years

Certificate in Public Administration

1 year

Faculty of Health Professions

Bachelor of Physical Education

4 years

Bachelor of Recreation

3 years of Recreation following 1 year of
Arts and Sciences

Bachelor of Science (Health Education)

4 years

Bachelor of Science (Kinesiology)

4 years

Bachelor of Science (Nursing)

4 years

Bachelor of Science (Nursing) with previous RN

3 years

Diploma in Outpost and Community Health Nursing

BN, 9 months; RN, 15 months

Bachelor of Science in Pharmacy

4 years of Pharmacy following 1 year of Arts and Science

Residency Programme Pharmacy (post BSc Pharm)

1 year

Bachelor of Science (Physiotherapy)

3 years Physiotherapy following one year of Arts and Science or minimum 2 years post Diploma programme)

Bachelor of Science (Occupational Therapy)

3 years Occupational Therapy following one year of Arts and Science

Bachelor of Social Work

3 years Social Work study following one year general study, a wide choice permitted

Faculty of Dentistry

Doctor of Dental Surgery

4 years

Diploma in Dental Hygiene

2 years Dental Hygiene following one year of Arts and Science

Faculty of Law

Bachelor of Laws

3 years

Bachelor of Laws with Master of Business Administration

4 years

Bachelor of Laws with Master of Public Administration

4 years

Bachelor of Laws with Master of Library and Information Studies

4 years

Faculty of Medicine

Bachelor of Science (Medical)

4 years

Doctor of Medicine

4 years

Intern Year

1 year

Residencies

various programmes ranging from 2-6 years post-intern

Doctor of Medicine with Doctor of Philosophy

7 years

Faculty of Graduate Studies

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, Earth Science, Human Communication Disorders (3 years) (Audiology or Speech Pathology), 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, Earth Science, Economics, Education, English, French, History, Interdisciplinary Studies, Mathematics, Microbiology, Oceanography, Pharmacology, Pharmacy, Philosophy, Physics, Physiology and Biophysics, Political Science, Psychology

Doctor of Philosophy with Doctor of Medicine

(Doctor of Philosophy thesis in: Anatomy, Biology, Microbiology, Pharmacology, Physiology, Biophysics)

7 years

Doctor in the Science of Law

2 years, 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 Library and Information Studies
with Bachelor of Laws**

4 years

Master in Marine Management

1 year

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

Diploma in Public Administration

1 year

College of Arts and Science

Introduction

The College of Arts and Science, established in 1988, consists of the Faculty of Arts and Social Sciences, the Faculty of Science, and the School of Education. The College of Arts and Science meets to discuss matters of concern common to its units, in particular those relating to academic programmes and regulations. The Dean of Arts and Social Sciences and the Dean of Science alternate, year by year, as Provost of the College. The Provost chairs College meetings and prepares the agenda for those meetings. Administrative responsibility for what is decided in College meetings remains in the two Faculties and School of Education. There are thirteen Departments and several interdisciplinary programmes in the Faculty of Arts and Social Sciences, and eleven Departments in the Faculty of Science. The School of Education is dedicated to the professional training of schoolteachers and to the study of education as an academic discipline. There are several interdisciplinary programmes of instruction in the College, the responsibility for which is shared among members from different Departments.

The College of Arts and Science is responsible for the curriculum of Bachelor of Arts, Bachelor of Science, Bachelor of Education, Bachelor of Music and Bachelor of Music Education degree programmes, for diploma programmes in Engineering, Meteorology, and Costume Studies, and for certificate programmes in Costume Studies and Educational Administration. The College is also responsible for the establishment of regulations governing students registered in its programmes.

The College of Arts and Science consists of several groups: some 5,500 undergraduate students who typically spend three or four years in the College, nearly four hundred full-time teaching and research faculty and staff as well as a number of part-time teachers and teaching assistants, and a support staff of secretaries and technicians. The student's academic role is to learn - from teachers, from laboratory experience, from books, from other students, and from solitary contemplation. Students learn not only facts but concepts, and what is most important, they learn how to learn.

Through intellectual interaction with other members of the academic community, undergraduate students should gain the

background knowledge, the ability and the appetite for independent discovery. Their acquisition of these components of liberal education is marked formally by the award of a Bachelor's degree. The academic faculty has two equally important roles: to teach the facts, concepts, and methods that the student must learn; and to contribute to the advancement of human knowledge through research and through scholarly or artistic activity.

BA and BSc degree programmes in the College are of three types: the four year or twenty credit degree with Honours; the four year or twenty credit degree with an Advanced Major; and the three year or fifteen credit degree with a Major.

The goal of the Bachelor's degree is to produce educated persons with competence in one or more subjects. Such competence includes not only factual knowledge but, more importantly, the ability to think critically, to interpret evidence, to raise significant questions, and to solve problems. A BA or a BSc degree often plays a second role as a prerequisite to a professional programme of study.

The College is particularly proud of the Honours programmes that it offers in most subjects to able and ambitious students. The BA or BSc with Honours is distinguished from the BA or BSc with Major or Advanced Major in that a higher standard of performance is expected, a greater degree of concentration of credits in one or two subjects is required, and at the conclusion of the programme each student must show a grade which is additional to those for the required twenty credits. Frequently Honours students obtain this grade by successfully completing an original research project under the supervision of a faculty member. Completion of a BA or BSc with Honours is an excellent preparation for graduate study at major universities throughout the world. Dalhousie is distinguished among Canadian universities in offering BA programmes with Honours in most subjects in which it also provides BSc Honours programmes and in providing BA and BSc degree programmes with Combined Honours in an Arts and a Science subject.

Provost of the College

W.C. Kimmins, PhD (London)

Faculty of Arts and Social Sciences

Location: 3rd Floor, Arts & Administration Building
Telephone: (902) 494-1440
FAX: (902) 494-1957

Introduction

The Faculty of Arts and Social Sciences was established on July 1, 1988. It consists of the Arts and Social Science Departments in the old Joint Faculty of Arts and Science. In these broad categories are units that study and teach in the humanities, languages, social sciences, and the performing arts. In addition there are interdisciplinary programmes of study leading to the BA degree. The Faculty of Arts and Social Sciences (FASS), together with the Faculty of Science and the School of Education, form the College of Arts and Science.

The central role of the Faculty of Arts and Social Sciences is the education of those wishing to comprehend the heritage of the past, recognize the complexities of the present, and use that understanding to plan for the future. The undergraduate programmes of the Faculty stimulate and refine the processes of critical analysis, disciplined speculation, and artistic expression. To understand more fully the conventions, history, and traditions of one's society is to understand more about oneself. Study and teaching in the Faculty of Arts and Social Sciences frequently involves questioning and analyzing why things are as they are, as well as understanding what they are. Some Departments in FASS teach and evaluate performance. The values associated with study and research in the Faculty of Arts and Social Sciences have long been recognized as central to a liberal education.

Officers of the Faculty

Dean

R.J. Smith, BA (Natal), MA (Oxon), PhD (Natal), McCulloch Professor in English

Telephone: (902) 494-1439

Associate Dean

M.E. Binkley, BA, MA, PhD (Tor), Associate Professor of Sociology and Social Anthropology

Telephone: (902) 494-1254

Assistant Dean (Students)

R.D. Syhem, BM, MM (Ill. Wesleyan), Associate Professor of Music

10 Faculty of Science

Telephone: (902) 494-1440

Secretary

W.T. Gordon, BA, MA, PhD (Tor), Professor
of French

Telephone: (902) 494-2430

Administrator

D.G. Miller, BCom (Acadia)

Telephone: (902) 494-1441

Departments and Programmes of the Faculty of Arts and Social Sciences

- Canadian Studies
- Classics
- Comparative Religion
- English
- French
- German
- History
- International Development Studies
- Music
- Philosophy
- Political Science
- Russian
- Sociology and Social Anthropology
- Spanish
- Theatre
- Women's Studies

Faculty of Science

Location: 3rd Floor, Arts and
Administration Building

Telephone: (902) 494-2373

FAX: (902) 494-1957

Introduction

Dalhousie's Faculty of Science, the primary centre in the region for science education and research, is part of the College of Arts and Science and consists of eleven Departments. The principal mission of the Faculty is the discovery, organization, dissemination and preservation of knowledge and understanding of the natural world. The Faculty is dedicated to excellence in the pursuit of this mission. Students in the Faculty of Science are assisted to develop the capacity for inquiry, logical thinking and analysis, to cultivate the ability to communicate with precision and style, and to acquire the skills and attitudes for lifelong learning.

Undergraduate students in the Faculty of Science normally develop these abilities by concentrating their studies in one or two of the following fifteen subjects: biology, biochemistry, chemistry, computing science, earth sciences, economics, engineering, marine biology, mathematics, meteorology, microbiology, neuroscience, physics, psychology, and statistics. Both BSc and BA degree programmes are available in most of these subjects. Details concerning particular programmes of study are provided below.

Officers of the Faculty

Dean

W.C. Kimmins, PhD (London), Professor of
Biology

Telephone: (902) 494-3540

Associate Dean

R.L. Mazany, BSFS (Georgetown), PhD
(UBC), Associate Professor of Economics

Telephone: (902) 494-3421

Assistant Dean (Student Affairs and Space)

G.F.O. Langstroth, BSc (Alta), MSc (Dal),
PhD (London), Professor of Physics

Telephone: (902) 494-2373

Secretary of Faculty

S. Swaminathan, MA, MSc, PhD (Madras),
Professor Emeritus (Mathematics)

Telephone: (902) 494-2373

Administrator

D.P. Chase, BSo (Queen's)

Telephone: (902) 494-1443

Departments of the Faculty of Science

- Biochemistry (also in the Faculty of Medicine)
- Biology
- Chemistry
- Earth Sciences
- Economics
- Engineering
- Mathematics, Statistics and Computing Science
- Microbiology (also in the Faculty of Medicine)
- Oceanography
- Physics
- Psychology

School of Education

Location: Education Building
Telephone: (902) 494-3724
FAX: (902) 494-2319

Introduction

As part of the College of Arts and Science, Dalhousie's School of Education offers programmes designed to enable students to take a critical approach to Education as a field of study. The professional preparation of school teachers is a primary goal of the school. Specific areas of study to which students are admitted include: English, French, Math, Science, Geography, Social Studies, and Music. Details concerning particular programmes are provided in the School of Education section of this calendar.

Officers of the School

Director

K.C. Sullivan, PhD (Alta), (902) 494-3724

Undergraduate Coordinator

H.J. Murphy, EdD (Virginia), (902) 494-6460

Undergraduate Assistant coordinator

A. Young, (902) 494-3300

Administrative Assistant

J. Riggs, (902) 494-3577

12 Faculty of Health Professions

Faculty of Health Professions

Introduction

The Faculty of Health Professions consists of the School of Nursing, College of Pharmacy, School of Recreation, Physical and Health Education, School of Physiotherapy, School of Occupational Therapy, School of Human Communication Disorders, the Maritime School of Social Work and the School of Health Services Administration. The various undergraduate programmes are described in the College and School sections of this Calendar. Details of the graduate programmes offered in the College and the Schools are described in the calendar of the Faculty of Graduate Studies.

Officers of the Faculty

Dean of the Faculty of Health Professions

Lynn McIntyre, MD, MHSO, FECPC

Administrator

Cole, Loma J.

Administrative Coordinator

Reed, Della H.

Faculty of Management

Location: 6152 Coburg Road
Telephone: 494-2582

Introduction

The Faculty of Management includes four schools - School of Business Administration, School of Public Administration, School for Resource and Environmental Studies, and School of Library and Information Studies. Undergraduate programmes are offered in the School of Business Administration in Commerce (BComm) and in the School of Public Administration (CPA). As of September 1991, the Bachelor of Commerce has been changed to a mandatory co-operative education programme.

Students wishing to enrol in programmes offered by the Faculty should address themselves directly to the Schools concerned for further information or for help in planning courses of study.

Faculty Officers

Dean

James D. McNiven
6152 Coburg Road, Telephone 494-2582

Associate Dean

John R. E. Parker
6152 Coburg Road, Telephone 494-1830

Directors

School for Resource and Environmental Studies

Raymond Côté
1322 Robie Street, Telephone 494-3632

School of Library and Information Studies

Mary E. Dykstra
3621 Killam Library, Telephone 494-3656

School of Public Administration

Dale H. Poel
1229 LeMarchant Street, Telephone 494-3742

School of Business Administration

Leonard C. MacLean
6152 Coburg Road, Telephone 494-7080

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 works directly with Atlantic Canadian business to foster the adoption of appropriate new technology based on biological processes. Its purpose is to help focus business's thrust to technological superiority. Start-up companies can be assisted through market, financial and the biological fields within Canada and beyond, including research and development resources and programmes, and provides advisory services, dealing with patents, management, and commercialization.

Atlantic Institute of Criminology

Director: D.H. 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. Research awards for graduate students in Criminology are available. Seed funding is also available for research relating to the justice system.

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

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

Atlantic Region Magnetic Resonance Centre

Director: Chair, Department of Chemistry

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 Bruker AC 250 and AMX 400 NMR instruments 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

Director: H.W. Cook, MSc, PhD

Established in 1967, the Centre conducts basic biomedical research and population studies in the fields of human genetics, cell membranes, neurobiology, and developmental nutrition. 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 metabolic disorders and 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 the Network of Centres of Excellence on Neural Regeneration, and by private donations.

Centre for African Studies

Director: J.L. Parpart, MA, PhD

This Centre, established in 1976, 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 organizes academic and informal seminars and public policy conferences on Africa and encourages interdisciplinary interaction at all levels on African subjects and issues. It 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 Canadian Maritime Policy and Strategy, and

International Political Economy and Developmental Studies. Geographical specializations include Canadian, African, European, and American foreign policy. The Centre publishes monographs and occasional papers plus a monthly defence newsletter covering Canadian defence and security policy issues.

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 also supervise masters and doctoral students in these fields.

Centre for International Business Studies

Director: P.J. Rossen, 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, research and outreach activity 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, LLB, MD, FRCS(C)

Assistant Directors: Stephen G. Coughlan, BA, MA, LLB, Ph.D., Diana E. Ginn, BA, LLB, LLM

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.D. Tillett, BA, MA

Associate Director: B. Lesser, BComm, MA, PhD

Assistant Director: P. Rodde, BA, MBA

The Lester Pearson Institute for International Development (LPI) was founded in 1985 to promote Dalhousie's involvement in international development activities. In mid-1987, LPI was merged with the Centre for Development Projects and was given responsibility for oversight of all externally financed development programmes and projects at Dalhousie. In addition to its administrative functions within the university, LPI undertakes major activities such as a development education programme for the campus and local community, a lecture and seminar series, conferences, research, a publications programme, and input to public policy on Canada's role in international development. Although LPI does not participate directly in academic degree programmes, it encourages and supports the study of international development issues and houses the Lester Pearson Chair in Development Studies.

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 sponsors a seminar series annually.

Oceans Institute of Canada/Institut canadien des océans

Executive Director: Judith Swan, BA, LLB, LLM

The Oceans Institute of Canada/Institut canadien des océans is a federally incorporated, non-profit organization established in 1976 and dedicated to promoting responsible management of the world's oceans.

The Institute serves the public and private sectors at national and international levels. Work is carried out by a permanent staff and experts drawn from a multidisciplinary panel of associates.

The location of its head office in Halifax promotes full collaboration with many other establishments concerned with ocean affairs, including Dalhousie University. The Institute has a Pacific Office in Vancouver.

Trace Analysis Research Centre

Director: L. Ramsley, 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.

Continuing Studies

Henson College of Public Affairs and Continuing Education

Note: For general information, particularly with regard to credit studies and degree programmes, students may call the Centre for Community Education, 494-2375.

Henson College offers Adult and Part-time Students:

- assistance in planning credit and degree programmes
- non-credit, general interest and pre-university classes
- training for managers in the private sector and for municipal administrators
- community outreach
- distance education courses in business
- and much more ...

The creation of Henson College signals Dalhousie's commitment to make itself more accessible to those who have special educational needs: those who can study only on a part-time basis; those who cannot attend classes during the working day; those who are returning to study after an absence from formal education; those seeking to improve skills and qualifications through credit, non-credit or special programmes.

Part-time and adult students are encouraged to contact Henson College in order to take advantage of the services which we can offer. In addition to pre-admission counselling on an individual basis, the College sponsors the University Exploration programme, an entrance programme for mature students. A "Returning to Learning" orientation is offered each September, in cooperation with Counselling and Psychological Services. The Centre for Community Education offers advice to those with special needs and our hours have been extended to assist those who work during the day. A variety of brochures are available, describing summer school and evening credit classes, non-credit and general interest classes, pre-university classes, and all of the other continuing education offerings of Henson College.

Henson College is located at the corner of University Avenue and Seymour Street. The main telephone number is 494-2528.

Officers

Dean

Douglas Myers, BA, BEd, MA (Tor), PhD (Edinburgh), Professor of Education

Associate Dean

Mary Morrissey, BA (Western), MSW (Dal), MPA (Harvard)

Advanced Management Centre

Director: Greg Trask, BComm (SMU), MBA (Dal)

Associate Director: Ann O'Neill, BCom, MBA (Dal)

Centre for Community Education

Director: Stephen Frick, BA (Tor), PhD (Cornell)

Associate Director: Lloyd Fraser, BA, BEd (MtA), MEd (Dal), EdD (OISE)

Community Development and Outreach

Centre for Public Management

Director: Jack Novack, BComm, MPA (Dal)

Associate Director: Roger MacMillan, BA, MPA (Dal)

Transition Year Programme

In 1982, the Transition Year Programme became a department in the Faculty of Arts and Science. In 1988, it became an independent department. It is a special one-year programme designed for Black and Native students.

While preparing its members for admission to regular programmes at the beginning of their second year on campus, the Programme introduces students to the University in a variety of ways. Its curriculum, which includes a variable number of credit classes, can be adapted to individual needs and objectives. Most students take classes in Black and Native Studies, Student Skills, English and Mathematics. They also choose a regular first-year elective that is of personal interest to them. Classroom instruction is complemented by an orientation week, special lectures, tours, workshops, field trips and counselling.

The Programme's staff are drawn from the Dalhousie University Community as well as the Nova Scotian Black and Native Communities. Guest lecturers come from all parts of the world.

Black, non-status Indian and Metis students accepted into the Programme are eligible for comprehensive bursaries during their transition year. If they successfully complete this qualifying year, they become

eligible for continued partial support as long as they remain in good academic standing and progress towards a first degree.

Status Indian students attending the Programme are fully funded through the Department of Indian Affairs' "University and College Entrance Preparation Programme", or the Mainland Confederacy, or from their individual Band Councils.

Although enrolment is limited to ensure that each student receives considerable personal attention, highly motivated Native and Black students of all ages and educational backgrounds are encouraged to apply. The TYP welcomes applications from student who did not complete high school or the courses required for university entrance, students who completed a general or mixed high school programme and those who, although they may have received low grades in any type of programme, can demonstrate intellectual potential in other ways.

The Programme has no absolute entrance requirements. Admission criteria are flexible, and the Admissions Committee considers each case comprehensively on its own merits. The candidate's overall maturity and seriousness of purpose are vitally important.

For further information or application forms, please contact:

Director, Transition Year Programme

Dalhousie University

Halifax, N.S. B3H 3J5

(902) 494-3730

Deadline for receipt of applications for the following September: May 1st.

Academic Credit Programmes

Part-time students are admitted to many of Dalhousie's credit programmes, either to work toward a degree or simply to take individual classes. Admission requirements and regulations generally are the same for all students, although special provision is made for the admission of mature persons through the University Exploration programme. For information on admission and registration procedures, degree requirements, fees, etc. see the entries elsewhere in this Calendar. For regulations concerning graduate study, consult the calendar of the Faculty of Graduate Studies.

Scholarships and Financial Aid

Certain awards and scholarships are available for part-time students who qualify. Details may be found in the appropriate section of this calendar.

Non-Credit Courses

A wide variety of non-credit courses is available in such areas as computers, language programmes, (Mini-Immersion in French, plus a variety of self-instructional programmes), the arts, law, health, social issues, career development and career change. Call the Centre for Continuing Studies at 494-2375.

Distance Education Courses

The Advanced Management Centre, in cooperation with Dalhousie's School of Business Administration, has developed a series of non-credit distance education courses in over 15 areas of business administration: accounting, business law, marketing management, finance, plus many others. Call the Advanced Management Centre at 494-2410 or 494-2526.

Henson College, in cooperation with Dalhousie's School of Public Administration offers a series of credit courses by distance education leading to a certificate in Public Administration for additional information call 494-8885 or 494-2526.

Resources and Services

Advisory Committee on Sexual Harassment

Dalhousie University is committed to an environment free of sexual harassment. A policy and procedures exist to deal with complaints of sexual harassment. Sexual harassment can take many forms, from constant joking to physical assault. It may involve threats that you will fail in class or that you will lose your job. It may make your study or work environment uncomfortable through continued sexual comments, suggestions, or pressures. Harassment is harassment, whether it's by a professor, a teaching assistant, a staff member, a student, or even a patient or customer.

If you believe you are being sexually harassed, you are encouraged to discuss your questions or concerns with the Sexual Harassment Advisor, Room 3, Arts and Administration Building, or phone the Sexual Harassment Information Line, 494-1659. All discussion will be kept confidential.

Alumni Association

The Alumni Association is composed of over 56,000 former students. Chapters scattered across the world keep alumni informed and involved with the Association. It coordinates a number of programmes including homecomings, reunions, branch meetings, sports events, information lectures, a Student Alumni Association, 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.

Recreation facilities on campus include: Dalplex—offering a 50,000 sq. ft. fieldhouse, olympic-size pool, two weight rooms, numerous "no-fee" courts, and an indoor jogging track; the Dalhousie Memorial Arena,

Studley Gym, and Studley Field. For details on fitness and recreation at Dalhousie contact Dalplex at 494-3372.

Black Student Advisor

The position of Black Student Advisor was created by Dalhousie University to provide information to prospective students, to increase access and promote retention of Indigenous Black students. However, any Black student (African, American, Canadian, Caribbean, etc.) is encouraged to visit to explore the services. The Advisor offers orientation programs for incoming Black students and support to continuing students. The Advisor gives individual assistance, relevant information, and makes referrals to other services which may benefit the students' academic, personal and social development.

The Advisor will provide employment and scholarship information as it becomes available. The Advisor organizes program activities that assist Indigenous Black students to develop contacts with other Black students. This is intended to foster a sense of support and community among the Black students, with other students and to increase intercultural awareness and understanding on campus.

For further information contact: Office - Black Student Advisor, Student Union Building, Halifax, Nova Scotia, B3H 4J2 (902)494-6848.

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, Presbyterian, and Orthodox traditions and can be reached through the Chaplains' Office on campus. The Chaplains' Office is located on the fourth 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 answering machine at 494-2287 to hear emergency numbers.

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, non-students who have been out of school for a period of time and are considering coming to university are welcome to take an interest test 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

Designed as a multipurpose facility, the Dalhousie Arts Centre is home to four University departments: Dalhousie Arts Centre (Administration), Dalhousie Art Gallery, and the two academic departments of Music and Theatre. The Arts Centre remains, after twenty-one years, an integral part of the cultural experience in our community and stands as the only arts complex of its kind in Nova Scotia.

Of the numerous performing arts spaces in the Dalhousie Arts Centre, the Rebecca Cohn Auditorium, or "The Cohn", as it is affectionately called, is the most familiar and prestigious. The 1040 seat concert hall is the home of Symphony Nova Scotia, as well as the venue of choice for a wide variety of performers ranging from The Royal Winnipeg Ballet to Blue Rodeo, The Chieftans, and Reveen! to name a few. Other performing and visual arts space in the Arts Centre include: The Sir James Dunn Theatre (240 seats), the David MacK. Murray Studio, Studio II, The MacAloney Room, and the Art Gallery.

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

Further information on the Music and Theatre Departments can be found in their separate listings.

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.

Students with disabilities are encouraged to contact the Director Housing and Conferences, Room 122, Student Union Building, for information and assistance.

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, see the Fees section of the Calendar.

Please Note: Academic acceptance by the University, i.e., admission to a course of study, DOES NOT 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. However, no decisions regarding residence accommodation will be made until April 1, when the Department of Housing and Conferences is advised of students who have been offered early academic acceptance.

A. Traditional Style On Campus Residence Howe Hall

Centrally located on campus, Howe Hall, provides accommodation for 520 undergraduate students. The sprawling, grey ironstone complex is divided into five houses: Henderson, Cameron, and Studley are for men only; Bronson and Smith Houses are co-ed. 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.

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

20 Resources and Services

Shirreff Hall

The women's residence on the Dalhousie campus, Shirreff Hall, provides accommodation for 445 female students. 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 both single and double rooms, and Newcombe and the Annex, with single rooms only. The Annex houses only 14 senior students and is distinct from the remainder of Shirreff Hall in that it has a separate outside entrance and is not directly accessible from the main residence.

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 planes.

Eliza Ritchie Hall

Opened in 1987, Eliza Ritchie Hall is a co-ed residence. It provides traditional residence accommodation for 84 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 satellite 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 satellite 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.

Glengary Apartments

Located close to the campus on Edward Street, Glengary Apartments is a four-storey brick building offering co-ed accommodation to 52 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 students. 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 buildings include bachelor, one and two-bedroom apartments and accommodate a total of 20 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 13 residence houses, five of which are now co-ed. All were once single family homes, and have 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 students in graduate programmes or professional schools, a few of the 90 spaces are reserved for undergraduates.

Two of the houses are designated as 24-hour quiet areas for students who want a particularly quiet environment in which to live and study. One of the houses is designated

as a French house, reserved for male and female students who would like to live in a French-speaking environment.

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 liaises with the Howe Hall Residence Co-ordinator and Facility Manager to provide administrative and resident-related services.

International Student Houses

Dalhousie reserves two houses for international students arriving in Canada for their first year of study. Located close to the main campus, these houses consist 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

For Howe Hall, Eliza Ritchie Hall, Shirreff Hall, Glengary Apartments and the Residence Houses:

Residence Office
Howe Hall
Dalhousie University
6230 Coburg Road
Halifax, N.S. B3H 4J5
(902) 494-1054

For Fenwick Place, Co-ed Apartment Units, International Student Houses:
Accommodation Office, Fenwick Place
Dalhousie University
5599 Fenwick Street
Halifax, N.S. B3H 1R2
(902) 494-2075

Instructional Development and Technology

The Office of Instructional Development and Technology (OIDT) is mandated to provide initiative, leadership, and co-ordination in the encouragement of improved teaching and learning at Dalhousie. To complement this primary goal, the Office has responsibility for the provision of improved instructional media services and distance education courses (primarily in the Health Professions).

In consultation with the Dalhousie community, the Office of Instructional Development and Technology develops and presents a variety of workshops and sessions to faculty and graduate teaching assistants. The newsletter *Focus on University Teaching and Learning* is published five times a year. Other Office publications may be purchased or borrowed from the OIDT Resource Centre, which contains many articles and books on educational topics. Information, teaching resources, and individual consultations are

also provided. Through active involvement in educational societies, the Office maintains a current inventory of practices and techniques designed to enhance teaching.

In supporting the development, planning, production, and presentation of distance education courses, the Office of Instructional Development and Technology assists the university in responding to the needs of those who wish to upgrade their education. To date, distance education courses have focused on the Faculty of Health Professions (e.g. Nursing, Physiotherapy, Occupational Therapy, and Social Work). However, other courses are also available from the School of Public Administration. Students should contact these schools directly about distance education offerings. General enquiries should be directed to the Registrar's Office. The Office of Instructional Development and Technology is located in the Killam Library Courtyard, telephone: 494-1622.

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.

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 system is made up of the following components: the Killam Memorial Library - Humanities, Social

Science, and Sciences, the Sir James Dunn Law Library, and the Kellogg Health Sciences Library.

As of April 1, 1992, the total Dalhousie University Library System holdings include over 1,410,000 volumes of books, bound periodicals, documents, and bound reports, 497,500 microfiche microcards, maps, and other media. Approximately 8,100 serials titles are currently received, and dead title holdings number over 11,000.

Dalhousie libraries participate in Novanet, a network which shares a single automated online catalogue of the holdings of the member libraries (Mount Saint Vincent University, Nova Scotia College of Art & Design, Saint Mary's University, Technical University of Nova Scotia, University College of Cape Breton, University of King's College, and the Atlantic School of Theology). Users borrow from Novanet libraries upon presentation of their University ID card.

Ombud's Office

The Dalhousie Ombud's Office offers assistance and advice to students experiencing problems while at Dalhousie, including difficulties associated with finances, academics, or accommodations. 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. Students retain full control over any action taken on their behalf by the Ombud's Office, and all inquiries are strictly confidential.

The Dalhousie Ombud's Office is located in the Student Union Building, Room 403. Regular office hours are posted on the door at the beginning of each Semester. The Ombud's Office can also be reached by calling 494-6583. In no one is available to take a call, students are requested to leave a message on the answering machine.

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.

Services for Students with Disabilities

Dalhousie University is committed to providing an accessible environment in which members of the community can pursue their educational goals. Ongoing efforts consistent with a reasonable and practical allocation of resources are being made to improve accessibility and provide special services.

The Advisor provides support and advocacy for students with disabilities. In co-operation with faculty, staff, and other student services at the university, the Advisor endeavours to provide appropriate support services as needed by the student. Students are encouraged to contact the Advisor as early as possible, (902) 494-2836.

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 being challenged by the University less intimidating.

The Advocates may be contacted through:

Student Advocacy Service

Room 402

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 Employment Centre

The main function of the Dalhousie Student 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 9:00am to 4:30pm. Telephone: (902) 494-3537.

The Employment Centre also has useful information on résumé 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 October, while new part-time jobs are posted daily for both "on campus" and "off campus" locations.

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.

University 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 crested 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.

University Computing and Information Services

University Computing and Information Services (UCIS) provides computing and communication services for students, faculty, and staff for instructional, research, and administrative purposes. It is responsible for all centrally managed computing and communications facilities.

UCIS manages a campus-wide communications network which interconnects office systems, laboratories systems, departmental computers, and central facilities. This network is connected to the Nova Scotia Technology Network, which in turn is connected to the national network CA*net which has worldwide connections. UCIS is also responsible for University telephones.

Central computer systems include digital VAX4500 which is used primarily for academic purposes; an Alliant FX/2816, which is a very powerful parallel processing system used for research; an IBM 4381 supporting the university's central administrative systems; and a SUN minicomputer providing UNIX services for undergraduates. UCIS also manages

numerous micro computer teaching laboratories which are situated throughout the campus, including laboratories in the School of Business, Engineering, English, Sociology, Law, Physics, Biology, Earth Sciences, Dentistry, Psychology, and at the central Computer Centre in the basement of the Killam Library.

All students may have access to these computing facilities on an individual basis or in conjunction with the classes that they take.

UCIS also manages the campus computer store (PCPC); provides short, non-credit computer related courses in conjunction with Henson College; and offers a hardware maintenance service for micro-computers.

University 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 specialties' 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.

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. The 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.

26 Degree Options

	One Year Programme	Two Year Programme	Three Year (15 credit) Major	Four Year (20 credit) Adv. Major	Four Year (20 credit) Honours	Five Year Program
Arts and Social Sciences						
Classics	--	--	BA	BA	BA	--
Comparative Religion	--	--	BA	BA	--	--
Contemporary Studies	--	--	--	--	BA + + + +	--
English	--	--	BA	BA	BA	--
French	--	--	BA	BA	BA	--
German	--	--	BA	BA	BA	--
History	--	--	BA	BA	BA	--
International Development Studies	--	--	BA	BA	BA	--
Music	--	--	BA	--	BA + + + +	--
Philosophy	--	--	BA	BA	BA	--
Political Science	--	--	BA	BA	BA	--
Russian	--	--	BA	BA	BA	--
Sociology & Social Anthropology	--	--	BA	BA	BA	--
Spanish	--	--	BA	BA	BA	--
Theatre	--	--	BA	--	BA	--
Women's Studies	--	--	BA	BA	--	--
Music, Music Education	--	--	--	BMus, BMusEd	--	--
Costume Studies	--	Certificate	Diploma	--	--	--
Dentistry	--	--	--	--	--	--
Dental Hygiene	--	Diploma +	--	--	--	--
Education	--	--	--	--	--	--
Integrated BA or BSc/BEEd	--	--	--	BA or BSc/BEEd	--	--
Integrated BPE/BEEd	--	--	--	--	--	BPE/BEEd
Integrated BMusEd/BEEd	--	--	--	--	--	BMusEd/BEEd
BEEd (sequential)	BEEd + + +	--	--	--	--	--
Health Professions						
Nursing	--	--	--	BScN	--	--
Nursing for Registered Nurses	--	See specific admission requirements on page 13				
Outpost and Community Health Nursing	--	See specific admission requirements on page 13				
Pharmacy	--	--	--	BSc(Pharm) +	--	--
Physical Education	--	--	--	BPE	--	--
Recreation	--	--	BRec +	--	--	--
Health Education	--	--	--	BSc(HE)	--	--
Kinesiology	--	--	--	BSc(Kin)	--	--
Occupational Therapy	--	--	BSc(OT) +	--	--	--
Physiotherapy	--	--	BSc(PT) +	--	--	--
Social Work	--	--	BScW +	--	--	--
Management						
Commerce	--	--	--	BComm + +	--	--
Public Administration	Certificate	--	--	--	--	--
Science						
Biochemistry	--	--	--	BA, BSc	BA, BSc	--
Biology	--	--	BA, BSc	BA, BSc	BA, BSc	--
Chemistry	--	--	BA, BSc	BA, BSc	BA, BSc	--
Computing Science	--	--	BA, BSc	BA, BSc	BA, BSc + +	--
Economics	--	--	BA, BSc	BA, BSc	BA, BSc	--
Earth Sciences	--	--	BA, BSc	BA, BSc	BA, BSc + +	--
Marine Biology	--	--	--	BA, BSc	BA, BSc + +	--
Mathematics	--	--	BA, BSc	BA, BSc	BA, BSc + +	--
Microbiology	--	--	--	BA, BSc	BA, BSc	--
Neurosciences	--	--	--	--	BA, BSc	--
Physics	--	--	BA, BSc	BA, BSc	BA, BSc + +	--
Psychology	--	--	BA, BSc	BA, BSc	BA, BSc	--
Statistics	--	--	BA, BSc	BA, BSc	BA, BSc + +	--
Engineering	--	Diploma	--	--	--	--
meteorology	Diploma + + +	--	--	--	--	--

+ following one year of appropriate university studies

+ + Co-operative Education programs are available. These programs include all the work required for honours together with several work terms. At least four to four and one half years are required for completion. (See pages four and five for more details.)

+ + + following an appropriate bachelor's degree

+ + + + Combined Honours only

Final Dates for Receipt of Applications for Admission

Regular Session

College of Arts & Science

Foreign Students (except USA)	May 1
BEd Programme	March 15
Students entering from Canada or USA ¹	July 1
Returning Dalhousie Students	August 15

Health Professions

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

Management

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

Internal Transfers⁵

Fall term	September 27
Winter term	January 17

Dentistry

DDS	December 1
Dental Hygiene	February 1

Medicine

MD	November 15
Post-Graduate	December 1

Law	March 1
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Graduate Studies⁴ (except as below) July 1 |

Law (doctoral level)	January 1
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Human Comm. Disorders	March 1
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Marine Management, Nursing, Health Ser. Admin. and Law (master's level)	May 1
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Non-Canadian Students (Graduate Studies)	May 1
--	-------

Oral and Maxillofacial Surgery ²	July 1
---	--------

Environmental Studies and Social Work	February 15
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Winter Term

Diploma/Outpost & Community Health Nursing for RN's	October 1
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BA and BSc programmes only ³	November 15
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Returning Dalhousie Students	November 15
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¹ Late applications may be considered up to August 1.

² Of year preceding commencement of programme

³ Part-time and transfer students only

⁴ All supporting documentation must be submitted by the appropriate deadline.

⁵ For students currently registered at Dalhousie wishing to change degree programmes.

Note: in order to be considered for entrance scholarships, applications for admission (from high school students) must be received by March 1.

Admission Requirements

Dalhousie University is an Affirmative Action and Equal Opportunity Educational Institution.

Basic requirements

Students from Nova Scotia high schools

Students wishing to study at Dalhousie should take at least five university preparatory classes designated as 44* or 54*. Course distribution should be as follows:

Category 1: English

Category 2: At least two of Biology, Chemistry, French, German, History, Latin, Mathematics or Physics.

Category 3: The remaining classes may be from those listed above or from Comparative Religion, Computer-Related Studies, Economics, Geography, Geology, Law, Modern World Problems, Music, Political Science, Sociology, Spanish, or Theatre.

Any special or experimental class must have been previously approved by Dalhousie if it is to be used as one of the credits needed for admission.

Special attention will be paid to grades in English and Mathematics. Students are expected to have an overall minimum average of 70%.

Mature students and others lacking usual admission requirements

If you are at least 23 years old and have been out of full-time high school study for at least four years, you may apply for the University Exploration Programme under the "mature student" category. Dalhousie's Henson College provides a wide variety of services to mature and/or part-time students and welcomes the opportunity to discuss your special needs with you. Contact Henson College at (902) 494-2528. If you apply as a mature student, you should enclose a letter indicating your activities since leaving high school and your reasons for expecting to successfully complete a university programme if you are admitted.

Transfer Students

Students wishing to apply for transfer credit should consult Academic Regulation 8 in this calendar as well as any additional requirements that may be listed herein under the appropriate degree heading.

International and Exchange students attending Dalhousie from elsewhere

International students must meet the following requirements:

- (a) Be a student in good standing at the home institution, and have paid required tuition fees.
- (b) Have the academic approval of their Department Head or Dean to undertake coursework
- (c) Have the required student visa to study in Canada
- (d) Provide official proof of English language proficiency for those whose first language is not English, which is a score of 580 on the Test of English as a Foreign Language (TOEFL).
- (e) Be able to provide proof of adequate Health Insurance for the duration of their stay in Canada.

Students studying for less than 1 full academic year are not able to take "R" courses. (See Definitions and Course Codes, page 3)

Students should be aware that not all courses listed in the calendar are offered each year. Please contact the Registrar's Office for a timetable of available classes for each semester.

Marks for completed coursework will be forwarded to the home institution according to the regularly scheduled reporting dates.

Students from outside Nova Scotia

Students are accepted from other provinces and countries at levels as shown below, with course distribution as for Nova Scotia.

Newfoundland and Labrador, New Brunswick, Prince Edward Island, Manitoba, Saskatchewan, Alberta and British Columbia: Grade 12.

Quebec: First year CEGEP with 80% minimum average in academic subjects.

Ontario: Five O.A.C. or Grade 13 credits.

U.S.A.: Strong B average in Grade 12; Submission of SAT scores of 1100 or better is required.

The United Kingdom, West Indies, West Africa: General Certificate of Education (GCE) with pass standing in at least five subjects, of which one must be English and at least two must be at the Advanced Level.

Hong Kong: GCE as for Great Britain, or University of Hong Kong Matriculation Certificate under same conditions as for GCE.

Bangladesh, India, Pakistan: Bachelor's degree with first or second-class standing from a recognized university; or in certain

circumstances, first-class standing in the intermediate examinations in Arts and Science, provided the candidate has passes at the university level in English, Mathematics, and a language other than English.

Note: This standing is not sufficient for admission to the sequential BEd programme at Dalhousie.

Regions not mentioned above: Write to the Registrar's Office, Dalhousie University, Halifax, N.S., B3H 4H6, for further information.

Application submissions

The following must be submitted by each applicant to the Office of the Registrar. It is the responsibility of each applicant to ensure that the application file is complete.

- a completed application form; forms not properly completed will delay processing,
- the application fee of \$30.00,
- an official record of high school work,
- an official transcript of the record of work done at previous post-secondary institutions (if applicable),
- evidence of competency in English for applicants whose native language is not English (see below),
- supplementary information as required for specific programmes, and
- mature applicants should also enclose a letter as indicated in the preceding section.

January Admissions

Admission is normally for classes beginning in September. The university does not admit full-time, first-year students in January because the number of "B" term classes available is very limited at the introductory level. Part-time students and transfer students, however, may be admitted for classes beginning in January. The deadline for application for January admission is November 15.

Response to applications

Dalhousie will respond to your application as promptly as possible and will advise you of any documentation still required.

When documentation is complete, applications are placed in the hands of the appropriate admissions committee. Although every effort is made to have decisions made quickly, there will be some delay at times, particularly in programmes where competition for places is keen.

As soon as decisions are made, whether admission, deferral or rejection, applicants will be advised.

Please note that admission to many programmes is limited. Therefore, possession of minimum requirements does not guarantee admission.

Early acceptance

Applicants currently attending high school, who have good records, i.e., a strong B average, may be given early acceptance, conditional on satisfactory completion of work for which they are currently enrolled.

Final acceptance

Applicants should successfully complete high school classes in the required subjects with a minimum B average. Admission will then be offered in Bachelor of Arts, Bachelor of Science, and Bachelor of Commerce programmes provided there is space.

English Language Tests

Dalhousie accepts minimum TOEFL results of 580 and minimum MELAB results of 90. Information may be obtained by writing to the English Language Institute, Testing and Certification Service, Ann Arbor, Michigan 48104, USA OR TOEFL Box 899, Princeton, New Jersey 08540, USA. Certified copies of original documents, or relevant sections of documents (e.g., calendar pages) are acceptable in lieu of originals. Certificates in languages other than English or French must be accompanied by certified translation into English.

International baccalaureate and advanced placement classes

If you are taking any of these classes, you may qualify for advanced standing. Contact the Registrar's Office for specific information.

Additional Requirements

Faculty of Arts and Social Sciences

Bachelor of Arts

- minimum of 65% in Grade 12 English

Bachelor of Music and Bachelor of Music Education

Students wishing to enrol in a degree programme offered by the Department of Music must fulfill the following admission requirements:

- satisfy the requirements for admission to the Faculty of Arts and Social Sciences
- demonstrate their proficiency as instrumental or vocal performers in an audition-interview
- demonstrate knowledge of the basic rudiments of music theory (equivalent to Grade II Theory of the Royal Conservatory

30 Admission Requirements

of Music of Toronto) and aural dictation: each assessed by written diagnostic tests as part of the audition-interview.

- submit the supplementary application form for the Department of Music. It is recommended that students apply early for purposes of admission, audition, and music scholarship consideration. Audition dates are listed with the supplementary application form. All audition procedures should be completed no later than June 30.

Applicants who, in the estimation of the Auditioning Committee, show considerable musical talent but are in need of more emphasis on preparatory skills will be required to take some foundational classes. Applicants with severe background deficiencies will be advised to prepare again through private instruction before reapplying.

Students wishing to transfer from another institution into the Second or Third Year of their chosen Music programme must take validation examinations in history, theory, aural and keyboard skills, and their applied major instrument before transfer of credits can be considered. Failure to pass an examination will necessitate enrolment in the appropriate First or Second Year class. Validation examinations must be written at the same time as the audition-interview. Transfer applications are subject to the deadlines stated in the preceding paragraph.

Note: All students entering the First and Second Years of Music Studies are required to register in the Bachelor of Music programme. Upon successful completion of the two-year core curriculum, students may either proceed to the Third Year of the BMus or apply to the BMusEd or BMusEd/BEEd programmes.

Certificate in Costume Studies (2 years), Diploma in Costume Studies (3 years)

- basic admissions requirements

Faculty of Science

Bachelor of Science and Bachelor of Science Co-op

- minimum of 65% in English and Mathematics 441 or equivalent
- programme may be combined with a Diploma in Engineering

Diploma in Engineering

- Grade 12 Chemistry and Physics
- minimum of 65% in English and Mathematics 441 or equivalent
- programme may be combined with a major in an Arts or Science subject (BA or BSc degree)

Diploma in Meteorology

BSc with major in Physics or other appropriate subject is required; strong background in Mathematics and Physics is necessary, and classes taken should also include Statistics and Computing Science. Specific recommended classes for admission to the Diploma in Meteorology include:

- Physics 1100, 2000A, 2005A, 2010B, 2015B, 3180A/3170B;
- Math 1000A/1010B, 2000, 2030A/2040B, 2070A/2080B, 3110A/3120B; and
- Computing Science 1400A/1410B.

School of Education

Bachelor of Education (sequential)

Along with the regular undergraduate application, applicants must submit:

- supplementary application form for the Department of Education
- two reference forms

After initial consideration of the applications by the Admissions Committee, interviews are arranged with promising candidates.

Final selection is based on:

1. **Academic record:** Applicants must have a BA or BSc by September in the year of application. As space in the programme is limited, applicants presenting a 3 yr. BA or BSc degree may not be competitive. Successful candidates often have breadth of academic preparation as represented by a 4 yr. degree, an honours degree or some type of further study. Candidates with other bachelor degrees should enquire from the Secretary, BEEd Programme.
 - Candidates for the BEEd secondary programme normally should have a minimum of a "B" average in their major subject, comprising at least five full credit classes (four beyond the 1000 level). This major should be in a "teachable" subject, i.e. English, Mathematics, Science, French, Social studies, or Music. Psychology and sociology are *not* teachable subjects.
 - Individual methods/field experience professors may have more specific requirements for admission. For example, candidates for French and Music must pass an audition/interview in their area. Candidates should consult the Calendar (under Field Experience), the School of Education Programme Planning Guide or the relevant professor.
2. **References;**
3. **Application form; and**
4. **Interview**

PE/BEEd Integrated

PE students may apply for admission to the School of Education at the end of their second year. Specific requirements include:

- the completion of a minimum of one full credit above the 1000 level in the teachable subject with minimum of B average obtained,
- an overall B average in Arts and Science courses, and
- a C or better average in PE/KIN subjects.

Secondary level students must complete three full credits in their teachable subject before they may take the methods course. Students in the elementary track must complete a minimum of three full classes from English, History, Mathematics and the sciences. It is recommended that courses be selected from each area.

BMusEd/BEEd Integrated

- two years of BMus at Dalhousie with at a least B average

Faculty of Management

Bachelor of Commerce Co-op

- minimum of 85% in English and Mathematics 441 or 442 or equivalent
- in addition to courses listed in Category three, the following university preparatory courses will be accepted:
 - Accounting
 - Business Organization and Management
- Admission to the Bachelor of Commerce Co-op will not be allowed after second year.
- The work term requirements of the Bachelor of Commerce Co-op may involve placement problems for Vica students. Subject to approval by the School, students may be permitted to arrange their own work term positions. Notwithstanding, the best interests of most Vica students may be better served by seeking admission to a university which does not have a mandatory Co-op programme.

Certificate in Public Administration

The programme leading to the Certificate in Public Administration is available to persons who meet the undergraduate admission requirements of Dalhousie University and who are not enrolled in a programme leading to a first degree. Those not meeting the formal admission requirements may apply for admission under the "mature student" category. Prospective students should submit to the Admissions Committee:

- application

- letter outlining work experience and other activities
- high school transcripts
- an interview may be required.

Faculty of Health Professions

Some of the programmes in the Faculty of Health Professions have been established to meet the needs of the Maritime or Atlantic provinces. Admission of applicants outside the preferred region is either severely limited or, in the case of Physiotherapy not granted.

Deposit

Due to the large numbers of applicants to limited enrolment programmes in the Faculty of Health Professions, a non-refundable deposit of \$200.00 (applicable to tuition fees) is required from accepted students as proof of intent to register. The \$200.00 is payable within three weeks of notification of acceptance.

Note: This applies to all programmes within the Faculty of Health Professions, excluding the Bachelor of Recreation.

School of Nursing

Bachelor of Science (Nursing) - Basic

- Grade 12 English, Chemistry and Mathematics.
- Grade 10, 11 or 12 Biology (at least one high school level biology).
- A 70% overall average and 70% average in the required subjects.
- Mature applicants require GED, Grade 12 Chemistry, and Grade 12 Mathematics.

Priority consideration will be given:

- first to permanent residents of Nova Scotia
- second, to permanent residents of other Canadian provinces.
- third to all other applicants.

Bachelor of Science (Nursing) - for Registered Nurses

The requirements for admission to the BScN for registered nurses are as for the BScN basic programme with these additional conditions:

- nursing registration in a province or territory in Canada
- successful completion of RN examination or equivalent
- Mature: Regulations concerning mature admissions are not applied rigidly. Applications from persons who lack the normal qualifications, particularly those who have been out of school for some years, are invited. Acceptance may be granted if the admissions committee is satisfied that their standing is such that they may be suitable for, and expected to benefit from, university work. Applicants

should submit information about previous studies and relevant experience. Interviews may be required. Upgrading in certain required subjects, e.g. Chemistry, Mathematics, may be recommended. Each applicant will be considered individually.

- Priority will be given to Nova Scotia and Prince Edward Island residents and Armed Forces personnel to be posted in Nova Scotia.
- Registration requirements are governed by the Registered Nurses Association Act of Nova Scotia (1985). Foreign students applying for admission must be eligible for registration as a nurse in Nova Scotia in accordance with the Act stipulated above. Applicants may be required to do some aspects of nursing content and practice if insufficiency in these areas are evident and are required for eligibility to register as a nurse in Nova Scotia.
- programme may be completed in three academic years or two calendar years; may also be completed by part-time study

Outpost and Community Health Nursing (Diploma)

- Nova Scotia Grade 12 or equivalent;
- Current registration in a province or territory in Canada or recognized equivalent;
- At least one year of work experience as a registered nurse, recent acute-care hospital experience is desirable;
- Demonstrated leadership potential

Admission preference is given to nurses currently employed by Medical Services Branch, Health and Welfare Canada or the government of the Northwest Territories. Other nurses are considered for admission if they agree to employment in a Canadian outpost setting upon completion of the programme. All applications must be approved by the Medical Services or the Northwest Territories' Government Education Leave Committee;

School of Occupational Therapy

Bachelor of Science (Occupational Therapy)

Students considering occupational therapy should consult with the School of Occupational Therapy as soon as possible, preferably before their first registration. In Arts and Science at Dalhousie University the required first-year classes are:

- Psychology 1000, 1010 or 1500
- Sociology 1000, 1050, 1100, or 1200
- one elective (writing class)
- two classes in different subject areas from: Biology 1000, 1001; Chemistry 1010R, 1020R, 1030R, 1040R, or Physics 1100 or 1300

- Although not a requirement for admission, it is recommended that students complete Statistics 1060 (or equivalent) prior to admission.

Students who complete the equivalent prescribed first-year programme at any recognized university will be given equal consideration for transfer into the School of Occupational Therapy.

Since enrolment in the programme is limited, applicants should note that admission is on a competitive basis with preference given to residents of the Atlantic Provinces. The provincial quota system currently allocates 9 positions to New Brunswick, 8 positions to Newfoundland, 16 positions to Nova Scotia, and 2 positions to Prince Edward Island. Selection is based on completion of prerequisites, academic achievement and personal suitability for occupational therapy. Selection procedures may require an interview and personal evaluation.

A completed application for the School of Occupational Therapy consists of the required submissions, with the exception of an official record of high school work, listed under "Basic Requirements" earlier in this section as well as:

- an autobiographical letter as described in the supplementary application material available from the Registrar's Office.
- one confidential assessment by a class professor (as described in the supplementary application materials) sent by the professor to the Registrar's Office.

College of Pharmacy

Bachelor of Science (Pharmacy)

Applicants to the College of Pharmacy must fulfil the requirements of a first year BSc student at Dalhousie University as outlined in the Degree Requirements section of this calendar. Equivalent subjects from other universities will be given equal status for purposes of determining admission.

Classes required for admission are the following Dalhousie classes:

- Chemistry 1010R or equivalent;
- Mathematics 1000A and 1010B or equivalent (one full year) Calculus;
- One of Physics 1000R, 1100R, 1300R or equivalent OR Biology 1000R or equivalent;
- One Humanities or Language;
- One Social Science

One of the above classes must be a writing class as described in the "Degree Requirements" section of this calendar. The same class/subject cannot be used to satisfy both the Humanities/Language and the Social Science requirement. Examples of

Humanities/Language and Social Science classes are given in "Degree Requirements" section of this calendar.

Information regarding credit for advanced classes may be obtained from the Registrar. Incomplete applications and applications submitted after the deadline indicated in the Final Dates for Admission will not be considered.

Selection Criteria:

The selection criteria used by the Admissions Committee include:

- place of residence,
- academic performance,
- scores on the Pharmacy College Admissions Test (PCAT), and
- interviews

A maximum of 60 admission points is assigned to academic performance, 10 admission points to PCAT, and 30 admission points to interviews. The top 66 applicants constitute the first year class and the next 12 applicants are placed on the waiting list.

Place of Residence:

Because this is the only College of Pharmacy for the Maritimes, preference is given to Maritime applicants. Attendance at a Maritime university does not, by itself, constitute having established residence in the Maritime provinces.

Applicants are considered to be from the Maritimes if:

- the principal residence of the applicant's parent(s) or guardian is located in the Maritime provinces, or
- the applicant (or spouse) has been employed full-time in the Maritime provinces for the preceding 12 consecutive months.

Applicants whose parent(s), guardian or spouse do not meet the residency requirements as a direct result of a recent employment transfer either into or out of the Maritime provinces would not necessarily be expected to conform to the above guidelines.

Exceptions to the above guidelines will be considered on an individual basis. Residency will be determined for each applicant on February 1st of the year for which admission is being sought.

No more than three students from outside the Maritimes are accepted into the first year class each year.

Academic Performance:

Academic grades of applicants and/or the university classes chosen form the basis of the evaluation of academic performance. Applicants should note that admission is on a competitive basis so that the ability to obtain consistently better than average grades

would definitely be an asset for the applicant. An academic record containing failures or poor grades makes the prospect of admission very unlikely.

Pharmacy College Admission Test:

Applicants must write the Pharmacy College Admission Test (PCAT). Information on test dates, testing centres and test format may be obtained from the Registrar's Office or by writing to PCAT, Psychological Corporation, 555 Academic Court, San Antonio, Texas 78204. Applicants are required to write the test no later than the February sitting.

Interviews:

Only those applicants who have obtained a high level of academic performance are invited for an interview.

In the interview, the following non-academic criteria are assessed.

- Motivation;
- Ability to Relate to Others;
- Self-Appraisal;
- Maturity; and
- Professional Attitude.

Notification:

Applicants will be informed of the status of their applications no later than late July. Those applicants who are put on the waiting list may expect to hear about acceptance as late as two weeks into the start of the academic term.

Deposit Fee:

In addition to the deposit requirement outlined on page 31, the following guidelines have been established for the College of Pharmacy: If the deposit is not received, the place will be offered to another applicant without any further notice. Students who have paid their deposits but who have not appeared at the College by the third day of classes will be considered to have withdrawn from the College unless they have written permission from the Admissions Committee.

Special Cases:

In exceptional circumstances, special consideration may be given by the Admissions Committee to applicants who do not meet all the admission requirements.

School of Physiotherapy

Bachelor of Science (Physiotherapy)

The minimum academic requirement for entry into the first Professional Year of the BSc (Physiotherapy) programme is successful completion of first year in Arts and Science at Dalhousie University or the equivalent at another University (see Academic Requirements). Students studying at

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Universities other than Dalhousie are requested to ensure that the pre-requisite courses they are taking are equivalent to the courses listed below by contacting the Registrar's Office.

- Two courses from Chemistry, Physics, or Biology. Acceptable courses are: Chemistry 1010, 1020, 1030R, 1040R; Chemistry 1000 or 2000 level; Physics 1000 or 1100 or 1300.
- One course from Psychology or Sociology and Social Anthropology. Acceptable Dalhousie University courses are Psychology 1000 or 1010; Sociology and Social Anthropology 1200.
- The equivalent of two full Arts or Science electives.
- CPR (Cardiopulmonary Resuscitation) Certification must be completed by the end of Year 2.
- A limited number of places may be made available for students who already possess a graduate degree in a discipline, considered by the Admissions Committee, to be relevant to Physiotherapy and whose course work may not include the prerequisite courses as described above. Such candidates are evaluated on an individual basis.
- The Admissions Committee will determine each year which applicants who will be interviewed. A limited number of interviews will be conducted each year.
- All applicants must sign a declaration regarding their physical and emotional suitability to undertake Physiotherapy.

Since the demand for admission exceeds the number of places available, candidates are judged on a competitive basis. The decision of the admissions committee is final.

Quota System:

The School of Physiotherapy at Dalhousie University is the only School serving Atlantic Canada. Due to the serious shortage of physiotherapists in the Atlantic provinces, a provincial quota system has been implemented. The provincial quota system means that a specified number of places will be allocated to each Atlantic province. 16 positions are allocated to Nova Scotia, 18 to New Brunswick, 12 to Newfoundland, and 2 to Prince Edward Island for a total of 48 positions.

Residency must be established by March 1 in the year for which application is being sought.

Transfer Students:

- Students who wish to transfer to the School of Physiotherapy from another University course in Physiotherapy must submit a written request for transfer to the Chair of the Admissions Committee of the

School of Physiotherapy and enclose official transcripts from all colleges and universities attended as well as the calendar descriptions of all courses taken. Such requests are assessed on an individual basis. Admission is subject to the availability of a place. In order to obtain the BSc (Physiotherapy) degree from Dalhousie University, any transfer student admitted into the School must conform with Faculty Regulations.

- Students with previous elective academic work seeking exemption from classes are assessed on an individual basis. Prospective candidates are strongly advised not to include classes of similar description and content as those offered in the second, third, and fourth (professional) years.

School of Recreation, Physical, and Health Education

Bachelor of Physical Education

In addition to the "Basic Requirements" above, admission from high school requires an average of 70% or better in five grade XII subjects including:

- English 441
- a minimum of two of Biology, Chemistry, Mathematics and Physics

Note: Mathematics 441 is a required pre-requisite for many classes in Mathematics, Science and Computing Science at Dalhousie University.

Admission with Advanced Standing:

Students may be admitted to the undergraduate programme with advanced standing if they have completed Arts and Science classes at Dalhousie or at a recognized university.

BPE/Bed (Integrated)

- Students may apply to this programme at the end of their 2nd year. Please refer to BEd section above for specific requirements.
- Advanced Standing: Students who have completed the three year Associate of the Nova Scotia Teachers' College, Truro, may be admitted with advanced standing, provided they satisfy the usual admission requirements for the Bachelor's Degree in Physical Education and Education at Dalhousie. The decision on granting credit depends on whether an acceptable level of accomplishment has already been demonstrated in a comparable class.

Bachelor of Recreation

The minimum requirement for entry into the Bachelor of Recreation programme is:

- successful completion of one year of university with a grade point average of 2.3 or higher

High school students or new students wishing to pursue a career in the field of recreation administration should apply for admission into either the Faculty of Arts and Social Sciences or the Faculty of Science.

The following courses are recommended for the first year of study:

- Psychology 100OR or equivalent
- Sociology and Social Anthropology 100OR or 120OR or equivalent
- Political Science 110OR or Economics 110OR or equivalent
- Any two electives
- Note that as per College of Arts and Science Degree Requirements one of the above courses should be designated a writing course (see "Degree Requirements").
- The Bachelor of Recreation programme will normally be completed in three years after entry into the programme. The programme may be longer if the student has not complete the recommended prerequisite courses outlined above.
- Selection will be made as soon as the final grades are available. There will be a limit of 40 places.

The Leisure Studies Division has an affirmative action policy to increase the number of students who have a physical disability or who belong to the Acadian, Black and Native minority groups of the Maritime region.

Bachelor of Science (Health Education)

Applicants should have completed Nova Scotia Grade XII (or equivalent) with an average of 70% in five university preparatory subjects, including:

- English and
- Biology or Chemistry.

NOTE: While Grade 12 Mathematics is not required for admission, Mathematics 441 will be essential if students are required or elect to take Mathematics, Science or Computing Science classes in their programmes.

Students already engaged in university programmes can transfer into the Health Education programme. Experienced persons in the workplace can be admitted as mature students. Inquiries about admission to this programme should be directed to the Head of the Health Education Division.

Bachelor of Science (Kinesiology)

Generally admission from high school requires an average of 70% or better in five grade XII subjects including:

- English 441
- a minimum of two of Biology, Chemistry, Mathematics and Physics; (Note: Mathematics 441 is a pre-requisite for many classes in Mathematics, Science and Computing Science at Dalhousie).

Transfer Students:

In order to be admitted to the programme, students transferring from other university programmes are expected to have a minimum GPA of 2.3 (using the Faculty of Health Professions formula to calculate the GPA.) The second year program for Kinesiology transfer students is outlined in the Kinesiology section of this calendar.

Maritime School of Social Work

Affirmative Action Policy

The School has an affirmative action policy to increase the number of qualified social workers who belong to the Aboriginal, Acadian and Black minority groups of the Maritime region.

Bachelor of Social Work

To be eligible for admission to the BSW programme, all candidates must meet the following minimum requirements:

- to have completed at least 5 full credits of general undergraduate study at a recognized university or equivalent institution of higher learning, for which the credits are appropriate for an academic background in Social Work;
- to have a cumulative academic average of at least B- or 65%;
- to show evidence of personal maturity and suitability for social work.

The first five university credits may be taken in any subject area except that of Social Work. The probability of admission is higher for all applicants if more than 5 credits have been completed by the date of application.

Note: Admission of University Students

While the completion of the above represents the minimum requirements for admission, acceptance for professional training in Social Work requires a well-developed interest and a willingness to engage in long-range planning. Enrolment is limited to the most qualified candidates. Applicants progressing from high school to university normally need a Bachelor of Arts or Social Science degree in the range of B+, or 75%, or higher plus relevant summer or part-time work experience in order to be competitive for admission.

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Volunteer experience in the social or human services is also an important asset. Students are advised to consider work or voluntary activities in which there is direct personal contact, preferably with some on-the-job training and supervision.

The BSW degree requires a minimum of two additional years of study following a first undergraduate degree.

Admission of Persons Over 25 Years of Age

Persons over 25 years of age with related work experience are considered on a combined basis of academic performance and demonstrated ability for Social Work practice. Enrolment is limited to the best qualified candidates only.

Completion of at least five of the general university credits, with the prerequisite b-average or better is expected prior to the application deadline date. Demonstrated ability for social work includes the nature and length of current or previous employment in social or related human services, and a positive work reference. Other experience in community services may also be considered.

Application Procedure

Applications for admission are assessed once a year only. Candidates are considered in relation to all others who apply in the same year. Although the Admissions Committee may request an interview as part of the selection procedure, personal interviews are not normally conducted.

In the case of credits currently in progress, decisions are made on the basis of Christmas grades; acceptances are conditional on the receipt of final transcripts.

Dentistry, Law, Medicine, and Graduate Studies

For information concerning admission into these faculties, consult the appropriate calendar, or contact the appropriate faculty office directly.

Fees

1993 - 1994

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

Telephone: (902) 494-3998

Fax: (902) 494-1534

Office Hours: 10:00 - 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 Table I.

Students should make special note of the registration deadlines contained in the calendar on pages 1 & 2. 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.

Mail Registration

For the convenience of students, registration material and non-cash payments are accepted by mail. Registrations with cheques post-dated to September 10, 1993 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 27th 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 \$20.00 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.
- Cash, certified cheque, or money order is required for payment of any account in arrears beyond the current academic year.

Admission Deposit

A deposit of \$200.00 is required by all new students in Specified Limited Enrolment Programmes within three weeks of receiving an offer of a place at Dalhousie. (Please refer to Table II for the definition of Specified Limited Enrolment Programmes.) Further information on the regulations governing the refund of admission deposits is contained in the section below on Changes, Refunds and Withdrawals (page 39).

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 differential fee is payable with the first instalment of fees each year.

Academic Fees

Academic fees are comprised of:

- (a) the tuition fee;
- (b) an incidental fee comprised of Student Union, Society and Athletic fees.

The complete 1993-94 academic fee schedule is not yet available. The Academic Fee Schedule shows the 1993-94 approved tuition and athletic fees, and the 1992-93 Student Union and Society fees. Once all fees are approved for 1993-94 the complete fee schedule will be made available. The official schedule will be included in the registration package.

For purposes of this section of the Calendar, a full-time undergraduate student is one who is registered for the first (fall) and second (winter) terms for more than three full credits (21 credit hours or more), or, if registered for only one term, for more than three one-half credits.

Changes from full-time to part-time and part-time to full-time status often have cost implications beyond what the student expects (see table IV). Any part-time student planning to add classes, or full-time students who are considering part-time status (dropping classes) should consult with Student Accounts to determine the impact these changes will have on the fees assessed.

Students registered in more than one programme are required to pay separate academic fees for each programme. Full-time students taking classes not credited towards their degree or programme will be required to pay additional fees for these classes.

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:

- a) must submit to the Student Accounts Office on or before the specified registration date the first instalment of academic fees unless they are receiving a scholarship, fellowship, Canada Student Loan, a fee waiver, or their fees are paid by external organizations;
- b) those holding external scholarships or awards paid by or through Dalhousie University must provide at registration documentary evidence of the scholarship or award;
- c) those whose fees are to be paid by a government or other agency must provide a signed statement from the organization at registration. (Please note: upon request, account status information will be made available to the sponsoring agency.)
- d) those whose fees are to be paid by Canada Student Loan must indicate 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 27. A late registration fee and/or interest may be charged after September 27. Failure to comply or arrange an alternative method of payment may result in deregistration).
- e) those whose fees are paid by a Dalhousie University staff tuition fee waiver must present the approved waiver form at time of registration and pay the Student Union, and Society Fee at registration.
- f) those who are Canadian citizens or permanent residents, 65 years of age or over and enrolled in an undergraduate degree programme will have their tuition fees waived but must pay applicable incidental fees.

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 to 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. Students in Graduate and Professional programmes wishing to withdraw should initiate formal action to withdraw at the office of the appropriate Dean.

Payment of Academic Fees

The complete 1993-94 academic fee schedule is not yet available. The Academic Fee Schedule shows the 1993-94 approved tuition and athletic fees, and the 1992-93 Student Union and Society fees. Once all fees are approved for 1993-94 the complete fee schedule will be made available. The official schedule will be included in the registration package.

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. (page 39)

- a) Should students prefer to pay in two instalments, the first instalment is due on or before September 10 and the second instalment is due January 31, or the first subsequent working day.
- b) Students registering for either the fall or winter terms only must pay fees on or before September 10 and January 4, respectively.
- c) Scholarships or awards paid by or through Dalhousie University will be applied to tuition and residence fees.

- d) When Canada Student Loan or co-payable bursary is presented at the Student Accounts Office, any unpaid academic, residence fees and/or Temporary Loans will be deducted.
- e) Fees cannot be deducted from salaries paid to students who are employed at Dalhousie University.
- f) Subsequent to August 27, 1993 we are unable to retrieve post-dated cheques.
- g) Any payments received will first be applied to overdue accounts.

Audit Classes

Full-time students may audit classes which are related to their programmes without additional fees. Part-time students auditing a class pay one-half of the regular tuition. In such cases, the student is required to complete the usual registration process.

A student registered to audit a class and during the session wishes to change to registration for credit must receive approval from the Registrar and pay the difference in class fees plus a transfer fee of \$25.00. This must be done on or before the last day for withdrawal without academic penalty. The same deadline applies for a change from credit to audit.

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 Registrar 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 instalment of fees.

Changes, Refunds and Withdrawals

Please consult Student Accounts for all financial charges and the Office of the Registrar for Academic regulations. Refer also to the Academic Fees section (page 37) and Table IV.

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

NON-ATTENDANCE AT CLASSES DOES NOT CONSTITUTE WITHDRAWAL.

- a) Written notification of withdrawal must be submitted to the Office of the Registrar.
- b) 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.)

- c) No refunds will be made for 30 days when payment has been made by personal cheque.
- d) A student who is dismissed from the University for any reason will not be entitled to a refund of fees.
- e) Refunds will not be made to a student who has paid an admission deposit for a Specified Limited Enrolment Programme.
- f) In any Specified Limited Enrolment Programme (See Table II and III), the first instalment of fees is not refundable after the first day of classes except on compassionate grounds (eg. illness).
- g) Refunds will be made to the Bank if a student has received a Canada Student Loan.
- h) Refunds will be prorated on fees paid by Scholarships.
- i) 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 27 will be charged full incidental fees and may receive a refund of tuition fees on a proportional basis. Please refer to Tables III and IV.

A student withdrawing or changing a class in January will be charged the full first instalment 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 tuition 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 27 will be charged full incidental fees and may receive a refund of tuition fees on a proportional basis. Please refer to Tables III and IV.

No refunds will be made to students withdrawing after October 25.

Dates for Refund - Second Term

A student withdrawing or changing a class after January 4 will be charged full incidental fees and may receive a refund of tuition fees on a proportional basis. Please refer to Tables III and IV.

No refunds will be made to students withdrawing after February 14.

Dates for Refund - Commerce Co-op Summer session

A student withdrawing after May 19 will be charged the BComm Co-op fee and may receive a refund of tuition on a proportional basis. Please contact Student Accounts for complete details.

No refunds will be made to students withdrawing after June 22.

Delinquent Accounts

Accounts are considered delinquent when the balance of fees has not been paid by September 27 (January 31 or the first subsequent working day, for students registered for the winter term only). Where payment in two instalments is permitted, the remaining balance is due January 31 or the first subsequent working day.

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 0.75% (9% 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 and Dalplex. 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 deregistered.

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 instalment of fees from a Canada Student Loan should apply to their 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. Please contact the appropriate provincial office to determine eligibility as well as course load requirements.

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. Please contact the appropriate provincial office to determine eligibility as well as course requirements for Provincial Bursaries. 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, Society fees, and Athletic fee. Seventeen percent (17%) of the remaining balance constitutes the tax credit.

A special income tax certificate will be available at Student Accounts annually no later than February 28. Replacement tax receipts will be provided within 3 weeks of the request for a charge of \$5.00 per receipt. On request, a replacement tax receipt will be provided within 2 days for a charge of \$10.00 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 wilful damage regardless of whether or not a deposit is required.

Athletic Fee

Membership at Dalplex for 1993-94 is included in the athletic fee for all full-time students at Dalhousie and all part-time students at Dalhousie taking a minimum of three full credit classes. 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. 494-2148

1992 - 93 Student Union Fee

(For Information Only)

	Full-Time (3 credits or more)
General Income	
For Opinions	\$40.00
Student Health Plan Insurance	\$44.00
Contributions to	
Capital Campaign	\$18.00
Capital Payback for	
Student Union Building	\$10.00
C.K.D.U. - FM	\$ 9.00
Yearbook Fee	\$ 8.00
Canadian Federation of	
Students' Membership	\$ 4.00
Students' Union of	
Nova Scotia Membership	\$ 2.00
Course Evaluation	\$ 1.00
South African Trust Fund	\$ 1.00
Public Interest Research Group	\$ 4.00
WUSC	\$.30
TOTAL	\$137.00

Table I

Miscellaneous Fees - Quick Reference

Fee	Amount	Payable To
Replacement Tax Receipt	\$5.00	Student Accounts
Priority Replacement Tax Receipt	\$10.00	Student Accounts
Late Registration	\$50.00	Student Accounts
Reinstatement Fee	\$50.00	Student Accounts
Returned Cheque	\$20.00	Student Accounts
Distance Education Fee, per class	\$100.00	Student Accounts
Admission Deposit	\$200.00	Registrar
Application Fee	\$30.00	Registrar
Late Graduation Application	\$50.00	Registrar
Letter of Permission		
per class - maximum \$50.00	\$10.00	Registrar
Reassessment Fee	\$10.00	Registrar
Replacement ID	\$12.00	Registrar
Transcript	\$5.00	Registrar
Priority Transcript Fee	\$10.00	Registrar
FAX Fee	\$5.00	Registrar
Residence Application Fee	\$25.00	Residence

Table II

Specified Limited Enrolment Programmes:

- Master of Business Administration
- Master of Library and Information Studies
- Master of Public Administration
- Bachelor of Education
- All programmes in the following faculties:
 - Faculty of Dentistry
 - Faculty of Law
 - Faculty of Medicine
 - Faculty of Health Professions

Table III

Fee Refunds - Specified Limited Enrolment Programmes

Admission Deposit: Non-refundable

Student Union Fee: Non-refundable after Sept. 27 (Second Term Jan 4)

Athletic Fee: Non-refundable after Sept. 27 (Second Term Jan 4)

Society Fee: Non-refundable after Sept. 27 (Second Term Jan 4)

Tuition Fee: As follows:

Withdrawal Date	Regular Session	First Term Only	Second Term Only
Up to August 20	100%	100%	100%
August 21 - September 13	95%	95%	100%
September 14 - December 15	40%	0%	100%
December 16 - January 4	40%	0%	95%
January 5 - January 31	40%	0%	0%
After Jan. 31	0%	0%	0%

Table IV**Fee Refunds (Withdrawals)**

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

Student Union Fee: Non-refundable after Sept. 27 (Second Term Jan 4)

Athletic Fee: Non-refundable after Sept. 27 (Second Term Jan 4)

Society Fee: Non-refundable after Sept. 27 (Second Term Jan 4)

Comm Co-op Fee: Non-refundable after September 27 (Second Term Jan 4)

Tuition Fee: As follows:

Withdrawal Date	Regular Session	Graduate Students	Graduate Students	Full-Time	Full-Time	Part-Time Students ²			
	Full-time ¹	Theatre Only	Part-Time for Degree	1st. Term Only ²	2nd. Term Only ²	A Class	B Class	C Class	R Class
Up to Aug 20	100%	100%	100%	100%	100%	100%	100%	100%	100%
Aug 21 - Sept 27	95%	95%	95%	95%	100%	95%	100%	95%	95%
Sept 28 - Oct 25	85%	85%	85%	87%	100%	87%	100%	85%	85%
Oct 26 - Nov 15	70%	70%	70%	0%	100%	0%	100%	70%	70%
Nov 16 - Dec 15	50%	50%	50%	0%	100%	0%	100%	50%	50%
Dec 16 - Dec 31	50%	50%	50%	0%	95%	0%	95%	50%	50%
Jan 1 - Jan 17	40%	40%	40%	0%	95%	0%	95%	40%	40%
Jan 18 - Jan 31	40%	40%	40%	0%	87%	0%	87%	40%	40%
Feb 1 - Feb 14	0%	0%	0%	0%	87%	0%	87%	0%	0%
After Feb 14th	0%	0%	0%	0%	0%	0%	0%	0%	0%

Fee Adjustments (Class Changes)

Students contemplating a change in class activity should consider the financial implications as well as academic.

Please contact Student Accounts if you have any questions regarding changes, refunds or withdrawals.

Students changing to part-time³ from full-time¹ after September 27 will be assessed the same percentage of full-time fees as students withdrawing from the University. Please refer to the refund schedule above to determine the percentage. Fees for classes remaining will be assessed according to part-time fees less the percentage used to calculate the portion owing for full-time fees.

Part-time students³ dropping a class will be assessed the same percentage as part-time students³ withdrawing from the University. Please refer to the refund schedule above to determine the cost of classes being dropped. Additions are assessed according to the fee schedule.

- ¹ Applicable to undergraduate students registered in regular session (Sept - Apr) taking more than three credits (21 credit hours or more). Applicable to graduate students with full-time status.
- ² Students registered in one term only taking more than three one-half credit classes (more than 9 credit hours).
- ³ Applicable to undergraduate students registered in regular session (Sept - Apr) taking less than three and one-half credit classes (less than 21 credit hours). Undergraduate students registered in one term only taking three one-half credit classes or less (9 credit hours or less).

ACADEMIC FEES - 1993-94

The complete 1993-94 academic fee schedule is not yet available. In order to provide some indication of the fee requirements, the schedule below shows the 1993-94 approved tuition and athletic fee as well as 1992-93 incidental fees. Once all fees are approved for 1993-94, a complete schedule showing total academic fees and the minimum instalments will be made

	Approved for 1993-94		(for information only) 1992-93 figures		Approved for 1993-94		(for information only) 1992-93 figures	
	Tuition fee	Athletic fee	DSU fee	Society fee	Tuition fee	Athletic fee	DSU fee	Society fee
Arts & Social Science								
Full-time (1)	2,886	50	137	5				
Full-time term (3)	1,330	50	137	-				
Part-time (5)								
3 Credit Classes	1,620	50	137	5				
1 Credit Class	540	-	28	-				
1/2 Credit Class	270	-	14	-				
Science (Except Engineering)								
Full-time (1)	2,780	50	137	5				
Full-time term (3)	1,380	50	137	-				
Part-time (5)								
3 Credit Classes	1,710	50	137	5				
1 Credit Class	570	-	28	-				
1/2 Credit Class	285	-	14	-				
Co-op Work Term	350	-	-	-				
King's (Arts & Social Science)								
Full-time (1)	2,886	(4)	-	5				
Full-time term (3)	1,330	(4)	-	-				
Part-time (5)								
3 Credit Classes	1,620	(4)	-	5				
1 Credit Class	540	-	-	-				
1/2 Credit Class	270	-	-	-				
King's (Science)								
Full-time (1)	2,780	(4)	-	5				
Full-time term (3)	1,380	(4)	-	-				
Part-time (5)								
3 Credit Classes	1,710	(4)	-	5				
1 Credit Class	570	-	-	-				
1/2 Credit Class	285	-	-	-				
Co-op Work Term	350	-	-	-				
Education								
Full-time (1)	2,880	50	137	5				
Full-time term (3)	1,340	50	137	-				
Part-time (5)								
3 Credit Classes	1,620	50	137	5				
1 Credit Class	540	-	28	-				
1/2 Credit Class	270	-	14	-				
Engineering								
Full-time (1)	2,900	50	137	25				
Full-time term (3)	1,480	50	137	-				
Part-time (5)								
3 Credit Classes	1,748	50	137	25				
1 Credit Class	582	-	28	-				
1/2 Credit Class	291	-	14	-				
Management								
BComm - Co-op (6/7)								
Year of Study 1 & 2	3,080	50	137	30				
Co-op fee	500	-	-	-				
Year of Study 3	1,610	50	137	30				
Co-op fee	280	-	-	-				
Year of Study 4	3,220	50	137	30				
Co-op fee	520	-	-	-				
BComm								
Full-time (1)	2,680	50	137	30				
Full-time term (3)	1,340	50	137	-				
Part-time (5)								
3 Credit Classes	1,620	50	137	30				
1 Credit Class	540	-	28	-				
1/2 Credit Class	270	-	14	-				
CPA								
Full-time (1)	2,680	50	137	10				
Full-time term (3)	1,340	50	137	-				
Part-time (5)								
3 Credit Classes	1,620	50	137	10				
1 Credit Class	540	-	28	-				
1/2 Credit Class	270	-	14	-				
Health Professions								
BSW								
Full-time (1)	2,880	50	137	10				
Full-time term (3)	1,340	50	137	-				
Part-time (5)								
3 Credit Classes	1,620	50	137	10				
1 Credit Class	540	-	28	-				
1/2 Credit Class	270	-	14	-				
Nursing (2)								
Full-time (1)	3,010	50	137	20				
Full-time term (3)	1,505	50	137	20				
Part-time (5)								
3 Credit Classes	1,800	50	137	20				
1 Credit Class	600	-	28	20				
1/2 Credit Class	300	-	14	20				
Occupational Therapy & Physiotherapy								
Full-time	3,010	50	137	13				
Pharmacy								
Full-time	3,010	50	137	38				
Clinical Residence - Pharmacy	586	50	-	-				
Recreation, Physical, and Health Education								
Full-time	3,010	50	137	10				
Full-time term (3)	1,505	50	137	-				
Part-time (5)								
3 Credit Classes	1,800	50	137	10				
1 Credit Class	600	-	28	-				
1/2 Credit Class	300	-	14	-				

For notes to Fee Schedule see next page.

Notes to Fee Schedule

- (1) Undergraduate Students taking three and one-half credit classes (21 credit hours or more) in regular session (Sept - Apr).
- (2) Nursing students will pay society fee only once per year.
- (3) One term only taking more than 3 classes (1/2 credits).
- (4) King's students may purchase Dalplex membership at an additional cost of \$75.00.
- (5) Undergraduate students taking less than three and one-half classes (less than 21 credit hours) or taking three one-half credit classes or less (9 credit hours or less) in one term only.
- (6) Students transferring into Co-op programme from another faculty pay a transfer fee of \$500.00. This payment is non-refundable.
- (7) BComm Co-op fees are non-refundable after September 27 (second term January 4).

Foreign Students - Students registering at Dalhousie University who are not Canadian citizens or permanent residents are required by Government regulation to pay an additional fee referred to as a "Differential Fee" in the amount of \$1,700. There is a proportional charge for part-time foreign students. The differential fee is payable with the first instalment of fees each year. Graduate Students please see Section 4.5 of the Graduate Studies Calendar to determine the number of years a student is required to pay the differential fee.

Health Insurance - foreign students (1992-93 rates for information only)

Vice Students	Postgraduate Medicine
Single - \$ 525	Single - \$ 693
Married - \$ 1050	Married - \$ 1388

Audits - Students auditing a class pay one-half the regular tuition fee.

Changes, Refunds and Withdrawals - For all financial charges contact STUDENT ACCOUNTS, or please refer to Tables III & IV. Please note non-attendance at classes does not constitute withdrawal. Written notification of withdrawal is required. Refer also to Academic Fee section (page 37).

Residence Fees

Please note the following are general statements. Given the diversity of residence facilities, available practices vary slightly from locale to locale.

Applications for accommodation in all residences are accepted on the understanding that the student will remain for the whole academic session.

When students who have chosen to live in residence and have secured a room withdraw from residence before the end of the school year, there are serious financial penalties. Written notice to withdraw is always required by the Residence Co-ordinator or Fenwick Manager. Complete information on withdrawal from residence is available from the Residence Co-ordinator or Manager and is detailed in the residence lease agreement to be signed by all residence students. No refund will be made to any resident who is dismissed for misconduct. Discretionary power in exceptional circumstances remains with the Director of Housing and Conferences or designate. Confirmation of accommodation will not be granted until the student has been accepted by the University for the coming session, and the \$125.00 residence application fee and deposit have been received. All residents, new and returning, who have accepted a room assignment, will be required to pay a second rent deposit of \$200.00 by July 15 to reconfirm the assigned space. Failure to make a second deposit by July 15 will result in automatic cancellation of room assignment. Once paid, the \$200.00 deposit is not refundable; it is our guarantee of your intention to live in residence.

Deposits may be made by cheque, bank draft, or money order in Canadian funds and payable to Dalhousie University. No reservations will be held on post-dated or "NSF" cheques. Deposits cannot be deducted from scholarships, fellowships, or similar awards.

Payment of Residence Fees

Payment may be made in full at registration, or for an extra charge of \$10.00, in two instalments. Scholarships may be applied to residence charges only after tuition fees for the full session are paid. The first instalment must be paid in full by September 30. Interest at a monthly rate as set by the University will be charged on all accounts outstanding after September 30 and on any second instalment outstanding after January 31. At the time of printing the monthly rate of interest is 0.75% (9% per annum). The student will not be permitted to register for another session until all accounts are paid in

full. A student whose account is delinquent for more than 30 days will be denied university privileges including access to transcripts and records of attendance and Dalplex. The student will be reinstated upon payment of the fees outstanding, the arrears interest, and a \$50.00 reinstatement fee.

For Howe Hall, Eliza Ritchie Hall, Shirreff Hall, Glengary Apartments and the Residence Houses fees are paid at the Student Accounts Office. For Fenwick Place, Co-ed Apartment Units and the International Student Houses fees are paid at Fenwick Place.

Students should make an appointment as soon as possible with the Associate Director of Residence Life, Fenwick Manager, or the Supervisor of Student Accounts if they are having financial difficulties.

Regulations and Additional Charges

The room and board session is defined as being from the Wednesday in September before classes begin in the College of Arts and Science to the last day of regularly-scheduled examinations in the College of Arts and Science in April. Please note that, except at Fenwick Place, students must vacate the residence twenty-four hours after their last exam and that residences are closed over the Christmas holidays.

No reduction in the board charge will be made for meals not taken, except that a rebate of \$200.00 per month may be considered in the case of illness or other cause necessitating absence of four weeks or more.

In Fenwick Place the rental period is based on a 34-week period beginning on Labour Day. For more specific details on dates of semesters, students should contact the accommodations office at Fenwick Place.

In all other cases, an additional fee is payable by all residents who are registered in a Faculty where the academic session commences before or continues after the session of the College of Arts and Science. Special arrangements are to be made with the Residence Co-ordinator or Manager for accommodation for periods prior to or following the session as defined above.

RESIDENCE ROOM AND BOARD RATES 1992/1993 (1)

The residence term for Howe Hall, Shirreff Hall, Eliza Ritchie Hall, Glengary Apartments and the Residence Houses cover the time period from the Wednesday in September before classes begin in the College of Arts and Science to the last day of regularly-scheduled examinations 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, 1993; and second semester - January 1, 1994, to April 30, 1994.

Note: Those students wishing to stay beyond the residence term may do so for a daily or weekly rate. Please contact the appropriate residence for details.

The student has two alternatives for payment after the first and second deposit have been paid:

- 1) Pay the balance in full by September 30th.
- 2) Pay the balance in two equal parts, first half by September 30th and the second half by January 31st, plus a \$10 service charge.

	FIRST DEPOSIT AND APP. FEES(3)	SECOND DEPOSIT AT JULY 15 (6)	BALANCE IF PAID IN FULL BY SEPT. 30		PAY IN PART BY SEPT. 30	BALANCE DUE BY JAN. 31	TOTAL (4) (Includes \$10 Service Charge)
Howe Hall (2)							
Single Room	\$125	\$200	\$4,380	Or	\$2,180	\$2,200	\$4,715
Double Room	\$125	\$200	\$4,040	Or	\$2,020	\$2,030	\$4,375
Shirreff Hall and Eliza Ritchie Hall (2)							
Single Room	\$125	\$200	\$4,380	Or	\$2,180	\$2,200	\$4,715
Double Room	\$125	\$200	\$4,040	Or	\$2,020	\$2,030	\$4,375
Residence Houses							
Single Room	\$125	\$200	\$2,435	Or	\$1,215	\$1,230	\$2,770
Double Room	\$125	\$200	\$2,085	Or	\$1,040	\$1,055	\$2,420
Glengary Apartments							
Single Room	\$125	\$200	\$2,440	Or	\$1,220	\$1,230	\$2,775
Double Room	\$125	\$200	\$2,110	Or	\$1,055	\$1,065	\$2,445
Bachelor Apts.	\$125	\$200	\$3,490	Or	\$1,745	\$1,755	\$3,825
Fenwick Place (4)							
2-Person (2-Bdrm)	\$125	\$200	\$3,295	Or	\$1,645	\$1,650	\$3,820
3-Person (3-Bdrm)	\$125	\$200	\$2,990	Or	\$1,490	\$1,490	\$3,305
4-Person (2-Bdrm)	\$125	\$200	\$2,630	Or	\$1,315	\$1,315	\$2,955

Meals Only - Special Rate For Session

3 Meals Per Day	\$1,905
2 Meals Per Day	\$1,840

Meals only plans may be purchased from Beaver Foods Office, Student Union Building.

Please note the following:

- (1) The above fees will be superseded on July 1, 1993, when the 1993/1994 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 non-refundable application fee.
- (4) At Fenwick Place \$100 of the \$125 prepaid is a damage deposit. See application form for details. The \$10 service charge is not applicable.
- (5) The second deposit due on July 15 is a \$200 non-refundable deposit to confirm the room.

Awards

Scholarships, Awards, Financial Aid, & Bursaries

The Awards Office within Office of the Registrar is responsible for:

- Undergraduate Scholarships
- University Bursaries
- University Short-Term Loans
- Canada Student Loans
- Provincial Loans & Bursaries
- Awards and Financial Aid Advice & Information
- Canada Scholarships

IMPORTANT NOTE: The University is reviewing the policy governing undergraduate awards. Consequently, portions of the following statement of policy may be modified or substantially altered and may be implemented during the course of the academic year of this Calendar.

Statement of Scholarship Terms

The above document is given to each awardee at the time of the announcement of a scholarship from the Undergraduate Scholarship Committee. This flyer contains some of the more pertinent policy items for easy reference. Additional scholarship regulations are listed in the following section.

General Policy

Full Class Load

- (a) Entering students to whom an entrance scholarship is awarded must undertake a full class load for the academic year immediately following the award in a designated degree or diploma programme at Dalhousie University proper. A full class load for most such designated programmes consists of not fewer than five full classes (or the equivalent), i.e. 30 credit hours distributed equally between the two terms, unless the prescribed standard credit hour load should be otherwise.
- (b) Continuing regular students are asked to note: To be considered for an in-course scholarship, a student must have carried in the preceding year a full class load (five whole classes or the equivalent, i.e., 30 credit hours, or that stipulated by the designated requirements of the programme).
- (c) Continuing Co-operative Programme students will be considered as are the regular students except that the

prescribed period may be either a term or an academic year depending upon where a given Co-op student is within that programme at the time.

Where Scholarships Are Tenable

Dalhousie University scholarships are tenable only at Dalhousie unless the Will or Trust Deed should otherwise permit. (The University of King's College has its own scholarship programme.)

Portability of Undergraduate Scholarships

Entrance and In-course Scholarships are portable amongst the following faculties and schools for the eligible degree/diploma programmes as indicated:

College of Arts & Science:

Bachelor of Arts; Bachelor of Education (Integrated); Bachelor of Music; Bachelor of Music Education; Bachelor of Science; Diploma in Engineering

Faculty of Health Professions:

- College of Pharmacy - Bachelor of Science in Pharmacy (in-course scholarships only)
- School of Nursing; Bachelor of Science in Nursing; Bachelor of Science in Nursing (RN) (for in-course scholarships only)
- School of Occupational Therapy - Bachelor of Science in Occupational Therapy (for in-course scholarships only)
- School of Physiotherapy - Bachelor of Science in Physiotherapy (for in-course scholarships only)
- School of Recreation, Physical and Health Education - Bachelor of Physical Education; Bachelor of Recreation; Bachelor of Science (Health Education); Bachelor of Science (Kinesiology)
- Maritime School of Social Work - Bachelor of Social Work (in-course scholarships only)

Faculty of Management:

- School of Business Administration - Bachelor of Commerce

Faculty of Dentistry:

- School of Dental Hygiene - Diploma in Dental Hygiene (for in-course scholarships only)

When Scholarships Are Tenable

- (a) Undergraduate scholarships to regular full-time students are tenable in the academic year immediately following their award.
- (b) Similarly, undergraduate scholarships to Co-op students are to be taken up in the academic term or year immediately following their award.

Scholarship Payments and Rebates

- (a) **Payments:** Dalhousie University scholarships are credited towards students' accounts first for tuition and prescribed fees, and secondly for residence fees.
- (b) **Rebates:** The portion of such scholarship money in excess of the aforementioned charges will be refunded to the student in one portion. The normal refund time is mid-November, and the refunds are made by the Student Accounts Office.

Scholarship Duration

Undergraduate scholarships normally are tenable for one year. The reintroduction of renewable scholarships has altered this.

In 1988-89 the University adopted renewable scholarships as the norm for its regular higher value awards. The two top tiers of the three-level scholarship plan are renewable for the normal duration of the programme in which the awardee was enrolled at the time of the award. These scholarships are renewable at the same value provided that the scholar attains a competitive level of academic excellence. The bottom level of award is tenable for one year only.

Eligible Classes

The Undergraduate Scholarship Committee considers those Dalhousie classes which are taken for credit in a designated degree/diploma programme during the academic year (or term in the Co-op programme). Beginning in 1992 Summer Session classes will also be considered. These will be assessed at the end of the summer if they should constitute part of five classes which heretofore have not yet been considered for in-course scholarships.

Correspondence classes are not considered for scholarship purposes.

Please note that classes taken at other institutions whether or not they have been undertaken with a Letter of Permission, are not eligible for scholarship assessment unless they are part of a Dalhousie University approved programme for Co-ordinated Education, International Development Studies or Women's Studies.

Artificial Academic Year

The adoption of the policy of considering full-time and part-time students on the same grounds has necessitated the use of artificial academic years.

Each year of study within each eligible program has a prescribed credit hour load. This figure is used in the calculation of the

student's Scholarship Grade Point Average. Please note that the Scholarship GPA and the Seasonal GPA differ.

Academic Year and Assessment Timing

The academic year consists of five sessions: Spring, Summer, Fall, Regular (Fall and Winter) and Winter. Although the University will assess students' records twice annually, a given student's record will be assessed only once. The time of the year when assessment for scholarship will normally occur is determined by the study status of the student.

For full-time students the University will normally assess records in May-June (most programmes) or later in the summer (for certain other programmes). Those co-op students who completed one academic year's studies as of the end of April will be included. For other co-op students, please see the next paragraph.

For part-time and certain co-op students the University will normally assess records in September-October for those students who at the end of August achieved the minimum threshold level for in-course scholarship consideration.

Reduced Class Load and Retention of Scholarship

To be eligible to hold the FULL amount of a scholarship in one of the eligible programmes, a student must maintain registration in **NO FEWER THAN THREE Whole Class Equivalents**, Co-op students excepted.

If one drops below the full-value minimum, the scholarship will be prorated according to the actual number of Whole Class Equivalents being carried. Note that the carrying of **FEWER THAN FIVE Whole Class Equivalents precludes** scholarship consideration until such time that that minimum is next obtained.

Record of Scholarships

Awards are recorded on the academic records of the students. The University retains the right to reassign the source funding of a student's scholarship as circumstances may warrant (but there would be no reduction in the amount).

Withdrawing

If it should become necessary to discontinue studies, it is most important that students do so in a formal manner via the Office of the Registrar. Depending upon the time of withdrawal, students may have a portion of the scholarship credited to their account.

Government Notification

Holders of Dalhousie University scholarships are to note that the University is required, upon written request, to report its award winners to the respective Provincial Student Aid Authority.

Entrance Scholarships

Dalhousie University offers scholarships, the values of which range from \$1000 to \$5,000, to outstanding students who are admitted directly from high school to the first year of study. Depending on the value of the awards they are tenable for one or more years. Renewable Entrance Scholarships which are worth either \$5000 or \$3000 are tenable for the duration of the programme to a maximum of four years, provided that the holder achieves a competitive level of academic excellence. Entrance Scholarships worth \$1600 are tenable for one year.

Non-renewable scholarships for subsequent years are also available and they are described under "In-Course Scholarships." Please note that entering students who may not qualify for an entrance scholarship will be considered for an in-course scholarship upon completion of first year (provided they have carried a full course load), funds permitting.

In order that applicants for admission to the University may be considered for scholarships, applicants must arrange with their high school for the submission of a completed Application for Admission Form to be received by the Office of the Registrar - Admissions by 1ST MARCH.

Criteria Summary

The following is a summary of the essential criteria which are used by the Undergraduate Scholarship Committee for their assessment of records of entering students who wish to be considered for an entrance scholarship.

1. The Application for Admission must be submitted in time to be received by the Admissions section of the Office of the Registrar by 1st March.
2. The USC considers Grade 12 (academic) subjects, their marks, the average (all academic subjects), the rank in class (very important), enriched classes and extra curricular activities.
3. The USC also considers Grade 11 (academic) subjects, average and rank in class.
4. The applicants are assessed on a mutually competitive basis for the available funds.
5. Applicants who are admitted to the University with a degree already are

considered Transfer Students and consequently are precluded from entrance scholarship consideration.

In the case of nominations for the Canada Scholarships, the USC uses the same criteria and, in nominating Canada Scholars, the University gives first preference to those to whom a Dalhousie scholarship has already been offered.

Please note that these criteria are subject to change without notice. Note also that the foregoing is not a definitive statement of criteria or policy.

Entrance Scholarship Funds

The following endowments (without an asterisk) make possible the funding of the aforementioned Dalhousie entrance scholarships. Entries marked with an asterisk are selected by bodies other than the Undergraduate Scholarship Committee. Unless otherwise noted, these scholarships are administered by the Office of the Registrar.

Robert Bruce Scholarships: The University is a beneficiary of a bequest from the late Robert Bruce of Quebec whereby a portion of the annual income is to be used for both entrance and in-course scholarships, and for bursaries.

James and Abbie Campbell Memorial Scholarships: A bequest from the late Elsie Alma MacAloney of Halifax made provision for the establishment of the James and Abbie Campbell Memorial Fund. The purpose of this fund is to promote the University's music programme through scholarships in music. Academically sound students who have demonstrated competency in music will be selected by the Department for one of several James and Abbie Campbell/Department of Music Scholarships. Other music students will be selected on the basis of their overall academic standing by the Undergraduate Scholarship Committee. The fund provides in-course scholarships also.

***Dalhousie Alumni Association Scholarships:** With a gift of \$20,000 in September 1988 the Dalhousie Alumni Association established an endowment from which the net annual income would provide two major scholarships to students of particular merit. These scholarships are open to students entering the University for the first time directly from high school into a course of study leading to an undergraduate degree or diploma. For further information contact the President, Dalhousie Alumni Association, c/o The Alumni Office, Dalhousie University.

***Dalhousie Alumni Leadership Scholarships:** A small number of these scholarships are

open to entering students who have demonstrated scholastic success in high school while maintaining a healthy extra-curricular involvement. For further information contact the Alumni Office.

The Dalhousie Club of New York

Scholarships: A fund for this purpose, established by the Dalhousie Club of New York and placed in the hands of the Board of Governors of the University, endows several scholarships open to students entering the University in the College of Arts & Science from high school. The financial need of the candidates will also be considered. The fund provides in-course scholarships as well.

***The Frank R. Davis Memorial Scholarships:** These scholarships are made possible by a fund established by Mrs. Davis in memory of her late husband, the Hon. Frank R. Davis, Minister of Public Health in the government of Nova Scotia and a graduate of this University. The scholarship will be awarded by the University to deserving graduates of the Bridgewater High School, on the nomination of the Supervisor of Schools and the Senior High School staff. In selecting candidates, the governing considerations will be scholastic standing, unselfishness of purpose, and interest in the common good. The fund may also be used for bursaries.

***Dover Elevator Scholarship:** One tuition scholarship will be awarded annually to a student entering the first year of the engineering or commerce programme. The recipient will have demonstrated high academic standing combined with a history of community involvement and leadership skills, and shown an interest in pursuing a career in business. The scholarship is renewable through second year, provided the recipient maintains a minimum Grade Point Average of 3.7.

***The Rowland C. Frazee Undergraduate Scholarships in Business Administration:** Two scholarships of \$5000 each are to be awarded annually to students entering the Bachelor of Commerce programme. Sponsored by The Royal Bank of Canada, these scholarships honour Mr. Frazee's long and distinguished career with the bank.

E. Ross Faulkner Scholarships: The University received from the Estate of Julia L. Faulkner a bequest to provide scholarships in memory of her husband, Dr. Ebenezer Ross Faulkner.

***C.D. Howe Scholarships in Engineering:** The C.D. Howe Memorial Foundation has established an endowment to provide annual scholarships of not less than \$5,000 each. The scholarships are open to matriculants from Nova Scotia high schools who have achieved high academic standing and who

are enrolled full-time in either the Diploma in Engineering or the BSc/Diploma in Engineering programme. Where candidates are deemed to be of equal merit, preference will be extended to female students. The scholarship is renewable on an annual basis for the duration of the programme provided that the holders maintain high academic standing and remain in the engineering programme. One scholarship will be offered initially; additional scholarships will be offered as the Fund matures.

The Percy Bertram Jollota Scholarships: From the Estate of Jean Minerva Jollota came a bequest, the annual income of which is to be used to provide scholarships in memory of her late husband, Percy Bertram Jollota. The awardees must be engaged in studies in engineering or physics.

The E. John Jordan Scholarships: Under the Will of the late E. John Jordan a bequest was left to the University for the purpose of funding entrance and in-course scholarships.

***The A. Murray MacKay Scholarship:** The North British Society has established an annual scholarship of \$500 which is open to a student entering Dalhousie from Queen Elizabeth High School. The Selection Committee will consider candidates on the criteria of academic ability, financial need and leadership. The criteria are weighted equally. The late Dr. MacKay was chairman of the School Board at the time when QEH was constructed. (under review)

Frederick A. MacMillan Scholarships: The late Frederick A. MacMillan bequeathed to Dalhousie University a sum of money, the net income therefrom to be used for scholarships. This fund has been designated for entrance scholarships.

The Hector Molnes Memorial Scholarships: In December 1937, an anonymous donor gave the University \$50,000 for undergraduate scholarships as a memorial to the late Mr. Molnes.

Silvanus A. Morton Memorial Scholarship: The Silvanus A. Morton Scholarship Fund was established in 1972 to endow one or more awards totalling approximately \$800. The awards are in memory of Silvanus A. Morton, Principal of the old Halifax Academy, predecessor of the Queen Elizabeth High School. The scholarship is to be awarded on the recommendation of the principal to one or more graduates of Queen Elizabeth High School upon entrance to Dalhousie University in the College of Arts & Science.

***The W. M. Nelson Scholarship:** Under the Will of the late Mr. William M. Nelson of Tatamagouche, funds have been made

available to provide a scholarship to Dalhousie University open to students attending North Colchester High School.

***Dalhousie-Nova Scotia Teachers' College Scholarship:** Dalhousie provides a scholarship of \$500 to a graduate of the Nova Scotia Teachers' College as recommended by the principal.

Harold Oxley Scholarship: A bequest under the late Mr. Oxley's Will makes possible the funding of a scholarship, which has been allotted to the entrance scholarship plan.

Arthur S. Payzant Scholarship: Under the Will of the late Reverend Arthur Silver Payzant a bequest was established for scholarship purposes. The University has allotted this fund to the entrance scholarship plan.

Pictou Academy Scholarship: In recognition of the common origin and close relation existing between Dalhousie University and the Pictou Academy, the University in 1917 on the occasion of the hundredth anniversary of the academy established a scholarship.

The Harold A. Renouf Scholarship: An endowment has been established to provide an annual scholarship for students entering the Bachelor of Commerce programme.

The Lois J. Robertson Scholarships: The University received a generous bequest from the Estate of the late Lois Robertson. This fund has been allocated to undergraduate scholarships.

***Shatford Memorial Trust Scholarships:** The J.D. Shatford Memorial Trust have established an endowment to provide assistance with the costs of attendance at Dalhousie University. The University's Fund is independent of any other such trusts.

Candidates must fulfil the following conditions: i) be coming directly to Dalhousie from either Chester Municipal High School or St. John A. Macdonald High School; ii) be recommended by the appropriate high school confirming that the applicant has been a bona fide resident of the Bequest Area for at least three years; and be undertaking studies leading to their first baccalaureate degree.

Subject to the availability of funds, these awards are renewable to the first degree (or four years maximum), based on satisfactory academic performance. Please note that the value of a holder's scholarship may vary from year to year.

***Alexander Sinclair Scholarship:** Under the Will of the late Evangeline Marion Winn, the University received an endowment for the purpose of providing scholarship awards to qualifying students from St. Mary's Municipality in the County of Guysborough,

Nova Scotia. Candidates are recommended by the St. Mary's Rural High School in consultation with the Awards Office.

Dr. David M. Sloan Scholarship: Under the Will of the late Dr. David M. Sloan the University received a sum of money. The Board of Governors decided that the gift be used to provide one or more entrance scholarships in the College of Arts & Science.

Joseph Duncan Stewart Scholarships: A bequest under the Will of the late Joseph Dunoan Stewart has made possible the funding of undergraduate scholarships.

***The I.C. Stewart Trust Fund:** From the Estate of George M. Stewart came a trust fund, the annual income from which is to be used for I.C. Stewart Scholarships to qualifying students from St. Mary's District in the County of Guysborough, Nova Scotia. Candidates are recommended by St. Mary's Rural High School in consultation with the Awards Office.

The J. Douglas Vair Scholarship: This scholarship is available to students entering the University for the first time from Pictou County, Queen's County, and rural Halifax County, and, failing a candidate from these areas, to a student from other areas of the Province of Nova Scotia at the discretion of the Scholarship Committee. The award shall be based on scholarship and need, making it possible for a promising student to obtain a university education. The scholarship may be continued beyond the first year to students from the three preferred areas if standing is maintained, but only if there is no first-year student eligible for the award.

The Women's Division of the Dalhousie Alumni Association Scholarships: This fund provides up to three scholarships of \$1,000 each. Of the two entrance scholarships, one is named the Margaret Florence Newcombe Scholarship, which commemorates the 100th anniversary of the graduation of the first woman graduate of Dalhousie University in 1885. This scholarship includes a financial need component and consideration of extra curricular activities, in addition to the attainment of high academic standing. The second scholarship is named the Ruth Stirling Murray Scholarship, in memory of a dedicated alumna of the Dalhousie Women's Division. (The third award, the Christine Irvine Scholarship, is open to returning students.)

The Lookward Memorial Scholarships: These scholarships have been established from an endowment by the late Reginald and Anne T. Lookward of Liverpool, N.S. A number of such scholarships, each valued at \$4,000 will be awarded annually; they are tenable for one year. Candidates for Lookward Memorial

Scholarships must be attending, or be graduates of, a high school in Nova Scotia and be eligible for admission to the first year of an undergraduate course of study leading to a first degree at Dalhousie University. Preference will be given to students in Queen's County. High schools outside the preferred area but within Nova Scotia may each recommend one student for consideration. Students will be selected to receive Lockward Memorial Scholarships on the basis of academic standing, character and financial need. A student may not hold both a Lockward and another University scholarship simultaneously. Candidates must be recommended by the principal of their high school. Please use the regular admission form, accompanied by letters of reference. Two letters of reference from members of the community who are familiar with the student's character and activities, should be included. The deadline for receipt of nominations is 1 March. Nomination forms and letters of reference should be sent to: The Director of Awards, Office of the Registrar.

Canada Scholarships

The federal government's Canada Scholarships Program awards over 2,500 scholarships annually to students entering undergraduate studies in selected natural sciences or engineering studies. The scholarship can be worth up to \$8,000 received as \$2,000 annually over four years. Furthermore, outstanding Canada Scholars in their third and fourth years of study in certain disciplines may also be recommended by their faculty to receive an additional award sponsored by the corporate sector. For more information, contact your guidance counsellor, the Awards Office within the Office of the Registrar, or:

The Canada Scholarships Program
Awards Division
Association of Universities and Colleges
of Canada
151 Slater Street
Ottawa, Ontario
K1P 5N1
Telephone: (613) 563-1238

The Canadian Merit Scholarship Foundation

The program was started in 1989 to identify, recognize and reward well-rounded students who combine distinguished talents with character, leadership potential and a commitment to the community. In 1991

Dalhousie University became a participating member of those institutions where the CMSF National Awards are tenable.

The scholarship consists of \$3,000 (paid by the Foundation) and tuition (paid by the University), renewable to a limit of four years of undergraduate study. The scholarships are renewable on the achievement of a Grade Point Average of 3.3 (B+), plus continued evidence of the qualities of character, leadership and service upon which the award is based.

Participating high schools may each nominate one student and are to forward the requisite documents to the CMSF Area Committee to be received no later than the November deadline.

Details of the process and criteria are available from your high school. Nominees must meet the admission requirements for Dalhousie University and the program which the student wishes to undertake.

In-course Scholarships

All Dalhousie students in eligible programmes in the participating faculties who have successfully completed a normal full class load will automatically be considered for scholarships. The normal full class load will depend upon the requirements of specific faculties and schools. The Undergraduate Scholarship Committee decides the awardees and the amounts of money. The amount of money authorized for a scholar may be met wholly or partially by a Dalhousie University Scholarship and/or one of the named scholarships as described in the following sections. Please note that transfer students are ineligible for scholarships in the year of their transfer.

(a) General

The Isabel Brown Scholarship: The scholarship was endowed in 1982 by the Brown family under the auspices of the Women's Division of the Dalhousie Alumni Association. The interest provides an annual scholarship ordinarily to a student who is entering the final undergraduate year. Note, however, that this scholarship is portable to programmes outside the list of designated undergraduate programmes as listed earlier.

Minnie F. Burbidge Scholarships: In her Will the late Minnie F. Burbidge bequeathed the residue of her estate to Dalhousie University. In 1945 the sum of \$16,000 was endowed to provide undergraduates, usually in-course, scholarships.

George H. Campbell Memorial Scholarship: In 1917 Mr. and Mrs. G.S. Campbell established

the George H. Campbell Scholarship Fund to provide annual scholarships in memory of their late son, George Henderson Campbell.

Marjorie F. Ellis Scholarships: The late Marjorie F. Ellis bequeathed one-half of the remainder of her estate to Dalhousie University for scholarships to worthy students.

W.L. Harper Scholarship: From the Estate of Arts Falconer Harper a bequest to the University makes possible the provision of a number of awards from the annual income.

Christine Irvine Scholarship: The Women's Division of the Dalhousie Alumni Association established this scholarship to honour the memory of a former Dean of Women.

Mackenzie Trust Scholarships: According to the Estate of Thomas George Mackenzie a Trust Fund was established for Archibald F. Mackenzie, and later bequeathed to Dalhousie University to provide (in-course) scholarships.

The Hector McInnes Memorial Scholarships: In December 1937, an anonymous donor gave the University \$50,000 for undergraduate scholarships as a memorial to the late Mr. Hector McInnes.

The Lois J. Robertson Scholarships: The University received a generous bequest from the Estate of the late Lois Robertson. This fund has been allocated to undergraduate scholarships.

Joseph Duncan Stewart Scholarships: A bequest under the Will of the late Joseph Duncan Stewart has made possible the funding of undergraduate scholarships.

The John L. and Glenna E. Towse Scholarships: A bequest to the University provides for a number of in-course scholarships.

Sir William Young Scholarship: This fund was left by Sir William Young for the purpose of endowing scholarships.

(b) Arts and Science

Nathan T. Ashkine Scholarship: Each year the Nathan T. Ashkine fund provides for a scholarship to a student in Arts & Science who is beyond first year.

Robert Bruce Scholarship: Robert Bruce of Banffshire, Quebec, made a bequest to the University to establish bursaries and scholarships.

The Charles and Cecelia Zwerling Scholarship: This fund was created by members of the Zwerling family in memory of Mr. and Mrs. Charles Zwerling for scholarship beyond first year.

(c) Arts

Dr. Frederick J. Gaudet Scholarship: Dr. Gaudet bequeathed to the University in 1978 a sum of money to provide for a full tuition scholarship in Arts.

The Hyman I. Jacobson Scholarship: Under the will of the late Hyman Isaac Jacobson a bequest of \$5,000 was given to the University to benefit the Humanities and Social Sciences.

The Khaki University Scholarships: From the Khaki University of Canada and the Young Men's Christian Association Memorial Scholarship Fund, the trustees of Khaki University made a gift to Dalhousie University in 1921 of \$6,500 to endow scholarships.

(d) Science

The Belle Crowe Scholarships in Chemistry: A bequest by the late Belle Chisholm Crowe, formerly of Truro, and a student at the University in 1885-86, enables a number of scholarships to be offered annually. The Undergraduate Scholarship Committee and the Department of Chemistry (see also) share the net annual income equally. The former awards Belle Crowe Scholarships to students in the Honours Chemistry programme which students have qualified in the yearly competition for in-course scholarships. The scholarships are directed to the most promising students entering the third or fourth year in the Honours Chemistry programme.

The L.A. DeWolfe Memorial Scholarship: A fund has been established under the Will of the late Dr. L.A. DeWolfe to provide undergraduate scholarships in Mathematics or Science.

The Percy Bertram Jollota Scholarships: From the Estate of Jean Minerva Jollota came a bequest, the annual income of which is to be used to provide scholarships in memory of her late husband, Percy Bertram Jollota. The awardees must be engaged in studies in engineering or physics.

The Carl Mushkat Memorial Scholarships: The Carl Mushkat Memorial Fund was established at Dalhousie University in 1979 as a bequest under the Will of the late Carl Mushkat. The fund provides scholarships to students in Mathematics or Science.

The Ross Stewart Smith Scholarships: A significant bequest established these memorial scholarships for students who excel in the sciences or mathematics.

The Mr. and Mrs. S.H. Solomon Scholarship in Engineering: This scholarship was made

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possible by Mr. and Mrs. S.H. Solomon and is to be awarded annually to a student entering the second year of Engineering.

The C.W. Stairs Memorial Scholarship: In 1960, William Stairs, Son & Morrow Limited of Halifax, on the occasion of the 150th anniversary of the firm donated \$10,000 to the University to set up this fund. It provides scholarships to students in Engineering, or in related subjects, who are entering the third year of the course and who, in the opinion of the Committee, are likely after graduation to contribute to the industrial development of Canada.

(e) Other

The following scholarships are administered separately from the regular in-course ones.

Beta Sigma Phi Scholarship to Dalhousie University: The Halifax-Dartmouth City Council of Beta Sigma Phi sorority has established an endowment of \$2,000 whereby the annual income will provide for a scholarship to a student studying towards a degree full-time or part-time at either the undergraduate or graduate level. The successful candidate will be selected from the following categories, listed preferentially: first, an active Member; secondly, a daughter, son or husband of an active Member; and thirdly, some other student chosen by the Undergraduate Scholarship Committee. **NOTE:** this scholarship requires a designated application form which must be submitted to the Awards Office by the May deadline.

George Burris Travelling Scholarship: Under the will of the late Mary Burris of Massachusetts a sum of money was bequeathed to the University to fund an annual scholarship in memory of her father. The scholarship is open to men and women who wish to undertake study in England. A designated application form is required. (Under review)

The Constance MacFarlane Scholarship: An endowment fund has been established to provide a scholarship to a deserving student in the second or subsequent year of the Honours programme in either biology or marine biology. Candidates must have completed at least one class in each of ecology and botany.

The W. Andrew MacKay Alumni Scholarship: The Dalhousie Alumni Association established an annual scholarship in honour of Dr. W. A. MacKay, a former president of the University. The scholarship is available to a student entering third year who has demonstrated high academic standing (a Grade Point Average of at least 3.3) and who has shown

an excellence in qualities of leadership, citizenship and sportsmanship. The award is tenable for one year in the faculties of Arts & Social Sciences, Health Professions, Management (Commerce), and Science. Candidates are to be nominated by each Department or School in the above list. Nominations are to be received by the Office of the Registrar by 15 May. The Undergraduate Scholarship Committee will select at least three candidates for final consideration by the Alumni Office.

The Alan Pollok Scholarship: This scholarship of \$750 was established by the North British Society in Halifax in memory of the Rev. Dr. Alan Pollok. The awardee will be the student, in second year in the College of Arts and Science at Dalhousie University, who stood highest in a course load of at least five full classes (or equivalent). (under review)

The George B. Robertson Phi Delta Theta Fraternity Scholarship: An endowment has been established to provide a scholarship to a student in full-time study in the junior or subsequent years at Dalhousie University. The selection of the awardee is based on several factors including a minimum Grade Point Average of 3.0, demonstrated activity in the Halifax Chapter and financial need.

Sony Science Scholarship: On the occasion of the 35th anniversary of the arrival of the first Sony product in Canada, Sony of Canada Ltd. has established an annual scholarship in the amount of \$3000. It is open to outstanding students in science or engineering.

The Stora Undergraduate Scholarship in Arts & Science: On the occasion of their 25th Anniversary Stora Forest Industries have established an endowment to provide one undergraduate scholarship open to students in Arts & Science. To be eligible candidates must reside in Nova Scotia, have demonstrated academic excellence and have exhibited a desire to learn. Students will be considered after one year at Dalhousie.

Departmental Scholarships

Biology

Hugh P. Bell Scholarship in Biology: In 1968 the Class of 1928 established the H.P. Bell Fund; the income therefrom is to provide one or more annual scholarships. The Biology Department each year will select the most promising honours biology student who is in Third year and that student shall hold the Hugh P. Bell Scholarship in the fourth year of the honours programme.

The Sarah M. Lawson Scholarships in Botany: At the discretion of the Chairman of the Department of Biology, the University

may offer scholarships to students who have shown special ability in botany. This award is open to students at Dalhousie University or the University of King's College, and is given to support summer research projects in botany at either the undergraduate or graduate level.

Chemistry

The Belle Crowe/Department of Chemistry Scholarships: These scholarships are awarded on the basis of academic standing and demonstrated proficiency in chemistry to students in the honours programme.

The E. Walter Todd Scholarship: A bequest from the Estate of Mabel E. Todd in 1958 established a fund to provide a scholarship (and inscribed volume) in memory of her brother, E. Walter Todd, who was for many years a member of the Department.

Earth Sciences

Amoco Canada Undergraduate Scholarship in Earth Sciences: Amoco Canada Petroleum Geology Limited offers an annual scholarship of \$1500 to a deserving student of outstanding merit in the Fourth and final year of an Honours BSc programme with a major in earth science. In addition to scholastic achievement, other criteria may include keen interest in earth science, participation in University and community affairs and economic need.

The James L. Hall Scholarship in Earth Sciences: This scholarship is awarded on the joint recommendation of the Chairs of the Departments of Engineering and Earth Sciences, to a student who has completed his/her first year, who is planning on a career in the field of Mining Geology.

Economics

Professor W. Russell Maxwell Memorial Scholarship: Friends and colleagues of Professor Maxwell have established a fund to provide scholarships to outstanding students entering the second, third or fourth year of the General Degree or Honours Degree programme in Economics. Preference will be given to candidates entering the fourth year of the Honours programme.

Engineering

John B. Kaye Memorial Scholarship: The Founder of this scholarship gave a benefaction of \$10,000 to be invested. From the annual income therefrom, one (later more) scholarship may be awarded to a suitably well qualified Dalhousie graduate who is continuing studies in an accredited programme in engineering at the Technical University of Nova Scotia. The holder shall be

a resident, native-born Nova Scotian who has completed the requirements for the Diploma in Engineering. The Selection Committee shall consider good marks, motivation, diligence, capability for making a contribution to the profession, and financial need. The amount of each scholarship shall approximate tuition fee (maximum of \$1,000) in the programme the awardee is to pursue. The scholarship will be paid upon presentation of proof of registration at TUNS.

English

Allen and Lura Bevan Memorial Scholarship: Colleagues and friends of the late Allan Bevan have established a memorial scholarship fund. The scholarship selection in the first place is to be made by the Department of English to a student majoring in English either at Dalhousie or King's. In the absence of a suitable candidate from English, the selection will be made by the Department of Music.

The Archibald MacMechan Chapter/IODE Scholarship in English: In 1948 the Archibald MacMechan Chapter of the IODE gave the University a scholarship fund. This award is intended for students who have shown special ability in English and who are looking forward to further study in the field. Provided that suitable candidates apply, preference will be given to graduates who intend to study for a Master's Degree in English. Application should be made to the Chairman of the Department of English not later than 31 March.

French

The Ruth Murray Scholarship for French Studies: An endowment fund has been established to honour the memory of Mrs. Ruth Murray by providing scholarships to students in the Department of French. These scholarships are open to undergraduate students who are academically sound and who are participating in one of the following:

- (a) a programme of study at the University of Aix-en-Provence, France, or
- (b) an off-campus summer course in a francophone environment arranged and directed by the Department of French.

In any year when there are no students participating in these programmes, the income may be disbursed as scholarships to academically sound students majoring in French at Dalhousie.

History

The George E. Wilson Memorial Scholarship: On the occasion of the 50th anniversary of

the graduation of the Class of 1930, a representative announced the establishment of a scholarship fund. The scholarships, in honour of Professor Wilson, are open to students in history.

Mathematics, Statistics & Computing Science

The Ralph and Frances Lewis Jeffery Scholarship: From the Estate of Frances E. Jeffery came a bequest in 1979 to endow a scholarship which is to be awarded to a student who has completed the final year of an honours course in Mathematics, and who has maintained at least a second-class standing during the first three years of the course.

The I.P. Sharp Associates Limited Scholarship: This scholarship is awarded annually to a outstanding student in either mathematics or computing science (with some experience in software development). The scholarship includes a job offer during the summer following the award presentation. Ordinarily the scholarship will be awarded when the student has two years before graduation. The job would be for the summer before the student's final year in the programme.

Music

The James and Abble Campbell Memorial Scholarships and the James and Abble Campbell/Department of Music Scholarships: The Undergraduate Scholarship Committee and the Department of Music make selections of winners for undergraduates. See entry under Entrance Scholarships.

Honourable L.D. Currie Memorial Scholarship in Music: The North British Society established this scholarship in memory of the Honourable Lauchlin D. Currie in 1971. An annual scholarship in the amount of \$750 is available to a Canadian in any year of Music. The successful student, will have demonstrated competence in vocal or instrumental performance. (under review)

Halifax Ladies Morning Music Club Scholarship: The Halifax Ladies Morning Music Club sponsors an annual scholarship of \$100 for a first-year student in Music at Dalhousie.

Elisabeth Meyerhof Scholarship in Music: An annual scholarship of at least \$1,500 awarded to the student entering the Fourth Year of his or her undergraduate degree programme in Music who has achieved a high average in the music classes of the first three years and who in the opinion of the Department has demonstrated exceptional promise for a professional career as an

instrumentalist in the performance of classical music (including early music). If no instrumentalist qualifies, a voice student would be considered.

The Effie May Rose Scholarships in Music: An endowment fund of \$25,000 was established under the Will of the late Effie May Rose. The income is to be used to establish yearly scholarships to (a) the most promising vocalist student from the Maritime Provinces or Newfoundland who requires financial assistance; and (b) on recommendation of the Senate of Dalhousie University to the most promising Maritime or Newfoundland student in the playing of the Piano, Organ, Violin or Cello who is in need of financial assistance. Scholarships range in value and in number.

The Don Wright Scholarships in Music Education: The Don Wright Charitable Foundation of Toronto established a generous endowment with which to fund these two scholarships. One scholarship is allocated to Classroom Vocal Music. Recipients of this award must fulfil the following criteria:

- a) be enrolled in the classes in classroom teaching methods and field experience at either the elementary or secondary level
- b) be studying voice
- c) have shown outstanding teaching skills and choral techniques in the Class, Music 4460A, and in choral practice in the classroom setting, Grades Five to Nine inclusive.

A second scholarship is allocated to Instrumental Music. Recipients of this award must fulfil the following criteria:

- a) be enrolled in classes in instrumental technique, teaching methods and field experience as well as classroom teaching methods and field experience at either the elementary or secondary level
- b) be studying a band or orchestral instrument; and c) have shown outstanding achievement in the above classes.

Spanish

Sonia Jones Scholarship: The first claim upon the expendable income of the Fund is to provide scholarships to advanced students of Spanish (Honours or Major) who are studying abroad in programme approved by the University.

Health Professions

College of Pharmacy

The Surroughe Wellcome Scholarship: This scholarship of \$400 is available to an undergraduate student of outstanding merit in the second-year class.

The Ralph H. Jenkins Memorial Pharmacy Scholarship: This scholarship is awarded by the Prince Edward Island Pharmaceutical Association to a student from Prince Edward Island who has achieved a high academic standing.

The Col. J.D.B.F. MacKenzie Scholarship: This scholarship of \$300 is awarded by the New Brunswick Pharmaceutical Society to a student from New Brunswick who obtains the highest academic standing in the first-year classes of the Pharmacy course.

The Dr. Jessie I. MacKnight Scholarship: This scholarship of \$300 is awarded by the New Brunswick Pharmaceutical Society to the student from New Brunswick who obtains the highest standing in the second-year classes of the Pharmacy course.

The New Brunswick Pharmaceutical Society Scholarship: This scholarship of \$300 is awarded by the New Brunswick Pharmaceutical Society to the student from New Brunswick who obtains the highest standing in the third-year classes of the Pharmacy course.

Searle Summer Research Scholarship: This scholarship in an amount of \$1,850 is made possible by funds from G.D. Searle & Co. of Canada, Limited and is to provide financial support for one undergraduate pharmacy student to take research training during the summer months under the supervision of a faculty member of the College of Pharmacy.

The Upjohn Company of Canada Scholarship: This scholarship of \$500 is provided by the Upjohn Company of Canada to a student in the first-year class. An engraved plaque is also awarded to the recipient.

School of Physiotherapy

Isabel M. Jackson Scholarships: Miss Ida P. Jackson of Middleboro, Massachusetts, established this fund in memory of her sister, Isabel M. Jackson, in 1967 for the purpose of benefiting students with bursaries or scholarships. The fund's current use is the provision of scholarships to those students who have been accepted into the first physiotherapy core year from other universities. Assessment is based on the students' mid-semester examinations at Dalhousie.

Hazel Lloyd Foundation Scholarship: The Hazel Lloyd Foundation has been established by Miss Aphra Lloyd in memory of her sister, Miss Hazel A. Lloyd (1930-1985), Associate Professor, School of Physiotherapy. Friends, associates and alumni have made additional contributions. One purpose of the Foundation is to provide financial support to final year students attending Dalhousie University School of Physiotherapy for studies that will develop physiotherapy services in geriatric and gerontology, one of Professor Lloyd's areas of interests. Occasionally, the Foundation will support other types of endeavours with an annual award. Written applications for the scholarship and the other types of award submitted to the School of Physiotherapy will be reviewed twice yearly (31st March and 30th September) by the administration committee of the Hazel Lloyd Foundation.

School of Recreation, Physical and Health Education

The Freda N. Wales Memorial Scholarship: This is an in-course award given to a student entering the third or fourth year of study. The student must have a commitment to pursuing a programme specializing in outdoor leadership at Dalhousie University. Selection will be based on academic achievement and professional ability. *Note:* A special application form, available from the Awards Office, is required.

The Vilth Pan American Wheelchair Games Scholarship: This is an in-course award given to a student entering the third or fourth year of study in the School of Recreation, Physical and Health Education. The student must be committed to pursuing study in the area of recreation and leisure for the disabled. Selection is based on academic and professional capability.

Maritime School of Social Work

Bachelor of Social Work

The M. Caroline Prince Scholarship: Under the Will of the late M. Caroline Prince the sum of \$5,000 was bequeathed to the University for endowment purposes to benefit the Maritime School of Social Work. The Faculty have decided that the endowment should fund one or more scholarships to students who are engaged either in full-time or part-time study leading to the baccalaureate degree.

Management

Bachelor of Commerce Programme

(a) Scholarships through the School

Acadian Lines Limited Scholarship: Acadian Lines Limited has established a fund to provide a scholarship to a student, beyond first year, who has demonstrated superior academic performance in the preceding year(s) of the commerce programme and, who has demonstrated outstanding leadership in the University's programme of intercollegiate athletics.

The Wilfred Berman Scholarship: A scholarship is offered to the student in Commerce who at the end of the second year has attained the highest average mark in Commerce 1101, 1102, 2111. The endowment for this scholarship was provided by friends and co-religionists of the late Professor Berman.

Ernst and Young Scholarship: A scholarship of \$500 will be awarded to a third-year student in Commerce who has obtained a high standing on the basis of his/her average marks for a full year's course, of which one class must be in accounting.

E.J. McConnell & Associates (Atlantic) Scholarship: A scholarship in the amount of \$2000 is to be awarded annually to a student entering the Third or Fourth Year in the Commerce degree programme. The recipient will have demonstrated high academic standing and an interest in the investment field.

Ronald G. Smith Scholarship: In 1981 the Nova Scotia Power Corporation established this scholarship in recognition of the distinguished service rendered by Ronald G. Smith as a member of the Power Corporation's Board of Directors from 1959 to 1981. An amount of \$400 will be awarded to a Nova Scotia student entering the fourth year of the Bachelor of Commerce programme based upon academic achievement, leadership ability and qualities of personality and character.

Deloitte and Touche Scholarship: A scholarship of \$400 will be awarded annually to a second-year student in Commerce obtaining a high standing in the course and who plans to enter articles with a practicing firm of Chartered Accountants.

Woolco-Woolworth Scholarship: The F.W. Woolworth Company Limited sponsors a scholarship of \$750 to the student (or students) who is (are) entering the final year of study and who has (have) demonstrated scholarship standing, leadership qualities and interest in retailing.

(b) Scholarships through the USC

Stewart Lockie Gibson Scholarship in Commerce: Several scholarships of varying amounts will be awarded annually to third- and fourth-year students of scholarship standing and good character who are proceeding to a degree in Commerce.

Samuel S. Jacobson Scholarship: Beginning in 1975 the Samuel S. Jacobson Fund has provided one or more scholarships or bursaries as determined by the selection committee. Preference is to be given to Nova Scotia students who are proceeding towards the Bachelor of Commerce degree.

The Harry Margolian Scholarships in Commerce: A bequest of the late Harry Margolian, of Yarmouth, Nova Scotia, enables one or two scholarships per year to be awarded to students working towards degrees in Commerce. These will normally be awarded to students in their third or fourth years.

McCurdy Printing and Typesetting Limited Scholarship: The Halifax firm of McCurdy Printing and Typesetting Limited established an endowment in 1985 to provide annually for a scholarship in the School of Business Administration. The Scholarship is open to a student, beyond first year, who has distinguished himself or herself scholastically during the preceding year(s) of study in the Bachelor of Commerce programme.

Undergraduate Prizes, Medals, and Awards

General

Alumni Swimming Award: A fund has been established to provide awards to deserving Dalhousie University varsity swimmers. Recipients will be members of the Dalhousie Varsity Swimming Team who have demonstrated leadership and dedication to competitive swimming. They are to have completed at least one year of their academic programme and to have demonstrated above average academic ability. Two awards of equal value will be presented to varsity swimmers, one to a female and one to a male. The Selection Committee will recommend to the Undergraduate Scholarship Committee by 31st May, where appropriate, two candidates for each award. The awards will be tenable the following academic year.

The Annie L. Beer Prize: Under the will of the late Mrs. Thomas (Annie L.) Beer of Charlottetown a bequest was established at Dalhousie University. The net income from the fund provides for an prize which is to be awarded to the youngest student from Prince

Edward Island who enters this University in each year. The Awards Section of the Office of the Registrar selects the winner.

Black and Gold Awards: Each year the Dalhousie Black and Gold Club funds a limited number of awards that recognize the contribution to University life that student athletes make. Candidates must be beyond first year study at Dalhousie, must have a minimum Grade Point Average of 2.0 in four whole classes (or equivalent) and must have participated on a variety team during the previous year of study. A number of awards up to \$1500 will be offered each year. For information and application forms contact the Department of Athletics, Dalplex. Completed application forms are to be returned to that Department to be received by May 15th. The Department of Athletics will forward nominations to the Selection Committee, which will make announcements through the Awards Office.

Dalhousie Student Development Awards: A limited number of awards of up to \$1,500 will be offered annually. The awards are open to entering or continuing Dalhousie students. Applicants must be engaged in full-time studies, have achieved a minimum Grade Point Average of 3.0 and must have demonstrated leadership ability. Applications forms are available from the Department of Athletics. Completed applications and supporting documents are to be submitted to the Director of Awards, Office of the Registrar, to be received by the end of August.

The Honourable W.H. Dennis Memorial Prizes for Literary Compositions in English: Two Prizes known as the Joseph Howe Prizes are offered each year, a first prize of \$200 and a second prize of \$100, for a poem or collection of poems of any length greater than about one hundred lines. Two prizes known as the James DeMille Prizes are offered each year, one of \$150 for an essay, the other of \$150 for a prose short story. The attention of candidates for these prizes is drawn to the following regulations adopted by the Senate to govern the awards:

1. Candidates for these prizes must be registered full-time undergraduate or graduate students at Dalhousie University.
2. (a) Three copies of each composition must be sent in by the competitor.
 - (b) These compositions must be typewritten, double spaced and on one side of the paper only.
 - (c) A pseudonym is to be typed at the end of each typescript and after the pseudonym a statement as to whether or not a first or second or no prize has been previously awarded to the writer.

(d) Compositions are to be accompanied by a sealed envelope bearing the same pseudonym in typewriting to the Jury of Award for either the Joseph Howe Prize or for the James DeMille Prize, as the case may be.

(e) The envelope shall contain in typewriting the pseudonym, the titles of the entries and the candidate's full name and address.

(f) Candidates submitting more than one prose entry must use the same pseudonym for each; different pseudonyms may be used for prose and poetry.

3. Candidates for the DeMille Prize may submit one entry in each of the essay and short story sections.
4. The winner of a prize in the poetry contest is not debarred from competing in the prose contest, and vice versa.
5. In the poetry contest no winner of a first prize is eligible to compete again, and no winner of a second prize is eligible for a second prize in a subsequent year.
6. In the prose contest no winner of a first prize is eligible to compete again, and no winner of a second prize is eligible for a second prize in a subsequent year.
7. Entries must reach the Department of English on the designated deadline.
8. Entries are adjudicated by a panels of judges which includes a professional writer. The decision of the judges is final.
9. No prize will be awarded for any composition that does not attain to a sufficiently high standard of merit.
10. *The Dalhousie Review* will be offered the first option to publish winning compositions. A copy of each winning composition is deposited in the University Archives. Contestants retain ownership of copyright.
11. Contestants are urged to retain a carbon or photostat copy of their typescript(s) since the copies cannot be returned.

The Clare Murray Foosee Poetry Prize: One or more prizes will be awarded for the best poems, of any length, submitted by Dalhousie undergraduates. Total prize money approximates \$400, which is the net income from a fund established by friends in memory of the poetess Mrs. Clare Murray Foosee, BA (1924). Up to five poems may be submitted by each writer. Previous winners are ineligible. No award will be made unless a poem submitted is deemed to be of sufficient merit. Entries should reach the Chairman of the Department of English by 1 March.

The SLT Bruce Galloway Memorial Prize: Friends, family and shipmates of Sub-Lieutenant Bruce David Galloway, a member of the Ship's Company of H.M.C.S. Fraser and a 1983 Arts graduate of

Dalhousie, have established a memorial fund. The prize is to be awarded to the student, male or female, attending Dalhousie University on the University Training Plan Men who attained the highest academic standing (not less than a passing standing) in the programme in which he or she is enrolled. A prize is to be awarded in each year in which there is a student attending Dalhousie on the University Training Plan Men who achieves a passing standing. The Awards Section of the Office of the Registrar selects the winner.

The Robert and Katherine MacDonald Award: An endowment has been established to provide an annual prize for Chinese students at Dalhousie. The recipient will be engaged in undergraduate studies and be a member of the Dal-TUNS Chinese Students' Association or its successor. The recipient will have demonstrated good academic achievement combined with leadership qualities and contribution to University life. The Association will recommend a candidate or candidates to the Head of Student Services.

College of Arts and Science Departmental Awards

Biochemistry

University Medal in Biochemistry: The Department of Biochemistry offers a medal to the top First Class Honours graduate in the Biochemistry programme. The awardee will be the one who has attained the high scholastic standard of the Department.

Kilmer MacMillan Memorial Book Prize: This prize is awarded annually to the student who attains the highest aggregate mark for the three half-classes, Biochemistry 3200, 3300 and 3400.

Biology

The Aldous Prize: On the occasion of the retirement of Dr. John G. Aldous, friends, colleagues and students established an endowment to provide for an annual prize to be awarded for the best achievement in Biology 4401. (This entry appears here for the information of Biology students. The Fund is administered by the Department of Pharmacology in the Faculty of Medicine.)

B'nal B'rith Prize: Two prizes of \$25 each, one for the student standing highest in Biology 1000 and one for the student standing highest in Biology 2000, are available each year.

David Durward Memorial Prize: This prize is to be awarded to the best student in the Physiology of Marine Animals (Biology 3071).

University Medal in Biology: The Department of Biology offers a medal to the top First Class Honours graduate in the biology programme in recognition of superior achievement therein.

University Medal in Marine Biology: The Department established this medal in 1983-84 to be awarded, where appropriate, to the student who stands highest among the First Class Honours graduates in the Marine Biology programme.

Chemistry

The John Hamilton Barrett Prize: This is the gift of his widow, Mrs. Marjorie Barrett. It is offered annually at the end of the fourth year of the course to a student who has shown exceptional ability in Chemistry or some other science.

The Canadian Society for Chemistry Silver Medal: The CSC Silver Medal is provided to each university having a chemistry department and is awarded to the student with the highest standing in chemistry and allied subjects in the penultimate year. The successful student receives a medal and a suitably inscribed certificate.

The Hugh Graeme Fraser Memorial Prize in Advanced Chemistry: This award was founded by members of the Class of 1931. The net interest will be awarded annually to that student at the end of his/her third year, who has, in the opinion of the Department, shown such aptitude for Chemistry as to merit the award.

Kenneth and Dorothy Hayes Memorial Prize: This endowment provides an annual prize to the student who has demonstrated interest in physical chemistry. The prize is awarded at the end of the penultimate year in the honours chemistry program to that student who has achieved satisfactory academic standing in Third- or Fourth-Year level classes in physical chemistry.

Dr. Oevald Knop Prize in Chemistry: An endowment provides for an annual prize to the top student (or students in the event of a tie) for the best achievement in both classes and laboratory work in the Second-Year Inorganic Chemistry class.

The Society of Chemical Industry, Canadian Section, Merit Award: This award (of an engraved gold key and a subscription to Chemistry and Industry) may be made to the Honours graduate in Chemistry with the highest standing. A minimum average of 75% is required.

Undergraduate Award in Analytical Chemistry: The Division of Analytical Chemistry of the American Chemical Society offers a number of gift subscriptions to

Analytical Chemistry. These awards are intended to recognize students who have completed the third undergraduate year and who have shown an aptitude for a career in analytical chemistry.

University Medal in Chemistry: The Department of Chemistry offers a medal to the top First Class Honours graduate in recognition of superior achievement in Chemistry.

Classics

University Medal in Classics: The Department of Classics offers to the top First Class Honours graduate in the classics programme a medal in recognition of superior achievement in Classics.

Earth Sciences

The David Barlow Memorial Award: The family, friends and classmates of David Barlow established in 1984 an endowment fund from which to provide an annual prize in his memory. The Dawson Geology Club in consultation with the Departmental Chairman will select a student in Second-Year Earth Sciences good academic record and the qualities of leadership as determined by the selecting committee.

Canadian Society of Petroleum Geologists Award: The Society sponsors an annual award consisting of a certificate and a one-year student membership to an undergraduate student who has demonstrated outstanding competence in petroleum geology or closely related fields.

G.V. Douglas Memorial Prize in Earth Sciences: In 1958-59, friends and former students of the late Professor G.V. Douglas, established a memorial fund from which the net interest would provide a prize to be awarded to an outstanding student in first-year Earth Sciences.

MacEachern-Ponsford Memorial Award: Family, friends and classmates of Ian Joseph MacEachern and Mark Anthony Peter Ponsford have established a memorial fund. The purpose of the endowment is to provide an annual award from the net income to a student who has completed the second year of a programme majoring in Earth Sciences, whose academic performance is of an honours calibre and who has been an active participant in student activities. The award is to be made on the recommendation of the Chairman of the Earth Sciences Department after consultation with the Dawson Geology Club and departmental staff.

The Mining Society Centennial Scholarship Medal: The Mining Society of Nova Scotia sponsors annual medals to students who

have distinguished themselves during university studies in the mineral, metallurgical or petroleum fields. The Department awards the medal allocated to Dalhousie to the best all round graduating student.

University Medal in Earth Sciences: The Department of Geology offers to the top First Class Honours graduate a medal in recognition of superior achievement.

Economics

The Anonymous Economics Prize: This prize, consisting of a book (or books) and a sum of money, is open to the Dalhousie undergraduate who is not in the final year of study and who has shown through an essay during the second year of study of economics, the best promise of successfully applying economics to the solution of human problems as determined by the selection committee.

University Medal in Economics: The Department of Economics offers a medal to the top First Class Honours graduate in recognition of superior achievement in Economics.

Education, School of

Eric Stanley Hills Memorial Prize: The annual net income from a bequest to the University provides a prize in memory of Eric Stanley Hills to a student in Education as selected by the Director of the School. The prize may consist either of one or more books chosen by the student in consultation with the Director or of a sum of money.

Engineering

The Association of Professional Engineers of Nova Scotia Award: The Association of Professional Engineers of Nova Scotia provides an award which is presented each year to that student graduating in Engineering who best demonstrates promise of using outstanding abilities to serve society in an ethical manner as a Professional Engineer. The award winner will be selected by students of the graduating class in consultation with the Engineering Faculty members. The award will consist of an engraved certificate.

The Walter P. Copp Memorial Prize: In 1979 an Anonymous Donor gave the University the sum of \$2,500 to establish an endowment for the purpose of funding this prize. It is awarded annually to the student graduating with the Diploma in Engineering with the highest average in Engineering classes.

The Kenneth F. Marginson Award: This prize is awarded annually to the student who achieves the highest standing in the first year

of the Diploma in Engineering programme. Only students who are enrolled in University for the first time are eligible to receive this award. Presentation of the award takes place when the student enrole in the second year of the Diploma in Engineering course. This prize is funded from an endowment of \$2,500 which has been established by an Anonymous Donor, in honour of Professor Kenneth F. Marginson, a former Head of the Department.

English

Paul Molson Memorial Prize: A memorial gift provides for an annual prize for an undergraduate student, who shows an enquiring and original mind, in the second or third year of study in the Honours or Major programme in English.

Margaret Nicoll Pond Memorial Prize In English: This prize will be awarded to the woman graduate of Dalhousie University who leads her class in English.

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.

The University Medal In English: Each year the Department of English offers a medal to the top First Class Honours graduate in recognition of superior achievement in the programme.

French

Prix du Consulat de France: The French Consul Prize will be made upon recommendation of the Department of French, to a student graduating with Honours in French.

Prix de l'Ambassadeur de France: A prize in books, offered by the French Embassy in Ottawa, is awarded annually to the graduating student standing highest in the advanced French class.

Prix de l'Ambassadeur de Suisse au Canada: A prize of books, the gift of the Ambassador of Switzerland in Canada, is awarded to graduating students who have won distinction by their work in the French language.

University Medal In French: The Department of French offers to the top First Class Honours graduate a medal in recognition of superior achievement.

German

Janet Gwendolyn Coade-Dessauer Memorial Prize: A prize, consisting of one or more books, will be offered to a deserving honours or graduate student in recognition of achievement in German language studies.

Prize of the Ambassador of Austria in Canada, Prize of the Ambassador of Switzerland in Canada, and the Prize of the Ambassador of Germany in Canada: The Austrian, German and Swiss embassies in Canada regularly offer German language books to the Department to be awarded to Dalhousie students whose achievement in German is outstanding. Awards are made at various levels of proficiency.

University Medal In German: The Department of German offers a medal to the top First Class Honours graduate in recognition of superior achievement.

History

The Edith and Rose Goodman Prize In History: Under the Will of the late Mrs. Jeanette Goodman a bequest was made to Dalhousie University to fund a prize (or two prizes) for the highest (or the highest and second highest) standing in the class in Canadian History. The prize is awarded on the recommendation of the Department of History.

The Dr. George E. Wilson Prize In History: In 1967 an endowment was established to provide an annual prize to be awarded for the best essay by a First-Year student in a first-year class.

University Medal In History: To the top First Class Honours graduate the Department of History offers a medal in recognition of superior achievement.

International Development Studies

University Medal In International Development Studies: A University Medal has been established for the student with the highest standing among those who graduate with First Class Honours.

Mathematics, Statistics and Computing Science

Bernoulli Prize: The Bernoulli Prize will be awarded annually to the student registered in the Co-op Mathematics Programme who has the best cumulative academic record, subject to the restrictions that the prize can be awarded only once to a given individual and that the winner must have performed acceptably in all work term assignments.

The Katherine M. Buttenshaw Prize: This prize, being the net interest of an endowment

of \$1,000, will be awarded annually to the student standing highest in the advanced Mathematics classes.

Digital Equipment of Canada Limited Award of Merit: Under the Annual Awards Programme of Digital Equipment of Canada Limited an award consisting of a Certificate of Merit and \$250 cash is offered annually. The award is open to the best graduating student in Computing Science.

The Ellen McCaughin McFarlane Prize: A Fund has been established in memory of Ellen McCaughin McFarlane, Class of 1927. Initially, the Fund is to provide an annual prize to an honours mathematics student who at the end of his/her first year* in the honours programme has achieved the highest standing.

* (Normally, this would be upon the completion of the second year at Dalhousie.)

Mobil Oil Canada Award: This is an award to the student enrolled in the Computing Science major or Honours Programme, who shows the best performance in the two third-year core half-courses CS 3690 and CS 3700. The recipient will be chosen on the basis of final grades and on the recommendations of the instructors in the courses and of the Director of Computing Science. Mobil Oil Canada Limited gave the University a gift of \$1,000 to endow this annual prize.

The Waverly Prize: This prize, being the net interest of an endowment of \$1,000 for the purpose, will be awarded annually to student standing highest in Mathematics 1010.

The Sir William Young Gold Medal: Founded by the bequest of the late Sir William Young, this medal will be awarded on graduation to the student who stands first among those taking First Class Honours in Mathematics. (This is the University Medal in Mathematics)

University Medal in Computing Science: In 1983-84 the Department established this medal to be awarded, where appropriate, to the student who stands highest among the First Class Honours graduates in the Computing Science programme.

University Medal in Statistics: The Department established this medal to be awarded to the student who stands highest among the First Class Honours graduates in the Statistics programme.

Microbiology

University Medal in Microbiology: The Department of Microbiology offers to the top First Class Honours graduate a medal in recognition of superior achievement in the programme.

Music

Dalhousie Women's Alumnae Medal: This medal is presented to the graduating student who has achieved the highest cumulative average in Music subjects during the four-year Bachelor of Music degree programme.

James and Abbie Campbell Prize, Campbell Incentive Award: The Department of Music may from time to time award prizes to outstanding students from the James and Abbie Campbell Memorial Fund. The Campbell Incentive Award may on occasion be awarded under special circumstances.

The Beatrice Davies Music Prize: A fund has been established by members of the Dalhousie community to mark Women's Centennial Year (1985) at this University. The purpose of the fund is to provide an annual in-course prize to a female student in the Bachelor of Music or Bachelor of Music Education programme on the combined basis of high academic standing and performance ability as determined by the Department of Music. The prize is named after the first graduate in music in 1909.

University Medal in Music: The Department of Music offers a medal to the highest ranking student of the year who graduates with the equivalent of a First Class Honours degree in the Bachelor of Music programme.

Philosophy

The F. Hilton Page Memorial Prize in Philosophy: This annual prize is normally awarded to the honours graduate whose Honours Essay is judged to be outstanding.

University Medal in Philosophy: The Department of Philosophy offers a medal to the top First Class Honours graduate in recognition of superior achievement in the programme.

Physics

The Dr. William J. Arohnbald Prize in Physics: An annual prize will be awarded to a student who, having completed the first year, is considered by the Physics Department to be the most promising among those entering the Honours Physics programme.

The Dr. E.W. Guptill Memorial Prize: This is to be awarded to the undergraduate student who best exemplifies the qualities of Dr. E.W. Guptill in showing initiative, experimental skill, leadership and enthusiasm for Physics, thereby making an outstanding contribution to Physics in this University. This prize will not necessarily be awarded every year.

The Dr. George Henderson Prizes in Physics: Several prizes are awarded to students who have shown special aptitude in Physics.

The James Gordon MacGregor Memorial Prizes: Relatives of the late Dr. J.G. MacGregor contributed to the James Gordon MacGregor Memorial Fund which now provides awards to both undergraduates and graduates in the study of Physics. The undergraduate awards are in the form of prizes.

The Dr. A. Stanley MacKenzie Prizes in Physics: These prizes will be awarded by the Department of Physics to the most promising students in the first two years of the Honours Physics programme. The fund was established under the Will of the late Miss Mary Alice Smith.

The Burgess McKittrick Prizes in Physics: Four prizes of \$100 each will be awarded to undergraduate students achieving the highest standing in each of the four classes, Physics 1000, 1100, 1300, and Physics 2110 and 2120 combined. No student may receive more than one such prize in any one year. The funds for these prizes come from the estate of F.J.A. McKittrick who graduated in 1894 with Honours in Mathematics and Mathematical Physics. He was the first Dalhousie graduate to receive the 1851 Exhibition Scholarship. The prizes are in memory of his brother, Burgess McKittrick, who was graduated in 1877.

Darrell Montgomery Memorial Prize: An endowment has been set up to provide an annual prize to the Third-year student in honours physics who is deemed to have shown a love of experimentation, the qualities of leadership and participation in student activities in physics related areas.

The University Medal in Physics: The Department of Physics offers to the top First Class Honours graduate a medal in recognition of superior achievement in the Physics course.

Political Science

The James H. Aitchison Award: In 1979 colleagues of Dr. J.H. Aitchison established a fund from which an annual prize would be awarded in recognition of the best undergraduate honours essay. The fund was established to honour Professor Aitchison who was instrumental in founding the Department.

The Eric Dennis Gold Medal: Founded by Senator William Dennis and Mrs. Dennis, this medal will be awarded on graduation to the student who stands first among those taking

First Class Honours in Government and Political Science. (This is the University Medal in Political Science)

The H.B. McCulloch Memorial Prize in Political Science: This prize will be awarded annually to the student who, among all the first and second year students registered in introductory classes in Political Science, is judged to have written the best essay in the second term.

Psychology

Brimer Memorial Prize in Psychology: The Charles J. Brimer Memorial Fund was established during 1971 in memory of the late Dr. Brimer, Acting Chairman of the Department of Psychology. The income from this fund is awarded to a third-year Honours student. Students enrolling for the Honours certificate in Psychology in the year equivalent to the fourth year of the Honours Psychology programme are also eligible for the prize. The Brimer Memorial Prize is restricted to Dalhousie Honours Psychology students and is not open to Joint Honours students from other departments or other universities. The prize will be given to the student who shows the greatest potential as a researcher in experimental psychology.

Frances L. Stewart Memorial Prize in Psychology: A fund has been established to provide a prize to a Fourth Year honours student who shows outstanding potential as a scientist/practitioner in clinical psychology.

University Medal in Neuroscience: To the top graduating student with First Class Honours in the programme the Department of Psychology offers a medal.

University Medal in Psychology: The Department of Psychology offers to the top First Class Honours graduate a medal in recognition of superior achievement.

Dr. Lilyan E. White Prize: A bequest from the Estate of Dr. Lilyan E. White established an endowment to fund a prize to an undergraduate student in Psychology. The Department has assigned the prize for use in recognizing the best performance of a student in second-year.

Russian

University Medal in Russian: The Department of Russian offers to the top First Class Honours graduate a medal in recognition of superior achievement in the programme.

Sociology and Social Anthropology

The Rev. S.H. Prince Prize in Sociology: A bequest under the will of the late Dr. S.H.

Prince established a fund to provide an annual prize to be available to students at either Dalhousie or King's.

University Medal in Sociology: The Department of Sociology and Social Anthropology offers a medal to the top First Class Honours graduate in the Sociology programme in recognition of superior achievement.

Spanish

The de Carteret Memorial Prize: The de Carteret Memorial Prize is payable from the net annual income of a fund which was provided as a gift in the memory of the late Norman S. and Heller S. de Carteret and their sister, Phyllis de Carteret Nielsen. The prize is to be awarded on the recommendation of the departmental chairman to an outstanding student in the Department of Spanish.

University Medal in Spanish: The Department of Spanish offers a medal to the top First Class Honours graduate in recognition of superior achievement in the Spanish programme.

Theatre

University Medal in Theatre: The Department of Theatre offers to the top First Class Honours graduate a medal in recognition of superior achievement.

Women's Division - Dalhousie Alumni Association Medal in Costume Studies: This medal is presented annually to the graduating student with the highest cumulative grade point average in the Costume Studies Programme.

Transition Year Programme

Morris Saffron Prize: A bequest under the Will of the late Morris Saffron established an endowment to provide an annual prize to a student in the Transition Year Programme who is judged to have made the greatest academic achievement during the year.

College Awards

Note concerning top medals and prizes: The Undergraduate Scholarship Committee adopted the following policy concerning the top medals and top prize, effective with the 1986-87 academic year:

In the event of a student taking a second degree at Dalhousie, then in order to be considered for the Governor-General's Gold Medal (since replaced by the Governor General's Silver Medal, 1988), the University Silver Medal or the Avery Prize, such a student must have completed at least 12 new classes at Dalhousie in the second degree programme and in the calculation of

the student's average, only these new classes will be counted. Furthermore, any disciplinary action by the Senate Discipline Committee, which action is recorded on the student's transcript, shall be deemed sufficient cause for such a student to be ineligible for the aforementioned top medals and prize.

The Avery Prize: This prize, being the net interest on the sum of \$500 bequeathed for this purpose by J.F. Avery, MD, will be awarded on graduation to the student standing highest among those being graduated from the general course.

The Governor-General's Silver Medal: Offered by his Excellency the Governor-General of Canada, it will be awarded to the undergraduate student who has achieved the highest academic standing among graduates of baccalaureate programmes. This is interpreted to apply to those students in Honours programmes who are graduated with First Class Honours. (Under review)

The University Silver Medal: This medal is awarded to the student who is judged to be the leading First Class Honours graduate of the year in either the arts or the sciences, in whichever field the Governor-General's Silver Medal was not presented. (Under review, depending upon terms of Governor-General's Silver Medal)

(Please note that Commerce students are eligible for the above three awards and that such students are grouped with Arts students in the assessment process.)

Faculty of Health Professions

College of Pharmacy

The Dean George A. Burbidge Memorial Award: This prize is awarded by the Nova Scotia Pharmaceutical Society to a student completing third year, from Nova Scotia, for outstanding qualities of character and pharmaceutical ability at the College of Pharmacy.

Bristol-Myers Squibb Book Prize: A copy of a pharmacy textbook is presented annually to the student with the highest standing in the second-year classes.

The R. Frank Chandler Award: A fund was established by Ortho Pharmaceutical (Canada) Limited in 1989 to support this Award. It will be presented to a student entering the final year of study at the College of Pharmacy. The candidate must have high qualities of character and spirit, must have well developed interpersonal skills, must show an

aptitude and proficiency for the profession, must show promise of making future contributions to the profession of pharmacy.

The F.R. Clayden Prize: This prize, in the form of a book, is presented in memory of Mr. F.R. Clayden (Class of 1912) to a deserving student completing the first-year classes of the pharmacy course.

Clinical Pharmacy Award: This award of \$150 is presented to a student in the fourth year therapeutic class. The student must have an aptitude for clinical pharmacy practice and must have achieved a high level of performance during the clinical clerkship.

Robert G. Crowell Memorial Pharmacy Award: This award of \$1000 is open to a student who is a resident of Nova Scotia who is entering the fourth year of study at the College. The candidate must have attained a satisfactory academic standing and show promise of making future contributions to the profession of pharmacy. The Selection Committee may consider financial need in the determining of an awardee. The award, sponsored by Crowell's Pharmacy Ltd., honours its founder for his contributions to pharmacy in the province.

Dale Daley Pharmacy Award for Excellence: This award was introduced in 1990 by Shoppers Drug Mart to recognize the many contributions of Dale Daley to the profession of Pharmacy. It is awarded annually to a third year pharmacy student who has demonstrated a good academic standing and whose contributions to undergraduate life at the university excel. The award is valued at \$2000.00.

Robert C. Dickison Memorial Award: This award is presented to a student from New Brunswick on the basis of academic achievement, financial need and participation in student activities at the College of Pharmacy. The Award is made available through a bequest of the late Mr. Charles D. Dickison.

The Dalhousie Student Pharmacy Society Book Award: A trust fund from various donations has been established in the name of the Dalhousie Student Pharmacy Society. The interest accrued each year is used to purchase a suitable book for presentation to a student completing the first year at the College of Pharmacy. The first-year students are asked to select the student who has contributed in an exceptional way to the life and spirit of their class. The main factors for consideration are active participation in student affairs and a keen interest in the profession of Pharmacy.

Drug Information Award: This award, in the form of a reference book or professional

journal subscription, is to be awarded to a worthy student in The Drug Information Class, Pharmacy 4900B.

J.G. Duff Pharmacy Award: This award, in the form of a medal, was established by Dr. Duff's former students and associates in recognition of his contribution and devotion to pharmaceutical education in the Maritimes. The award will be presented to a student entering the senior year for outstanding leadership and satisfactory scholastic attainment. A Senior Stick, bearing the names of the recipients, will be kept in trust by the Dalhousie Student Pharmacy Society. The recipient of the award will be selected by the student body.

The Dean J. Esmonde Cooke Award: This award of \$500 is to be given annually to a student who has successfully completed one or more years of the course leading to a degree in pharmacy and who is enrolled in pharmacy at the University for the coming year. Candidates must have attained a good academic standing and must show promise of making future contributions to the profession of pharmacy. The student must be a graduate of a high school in Nova Scotia and should not be the recipient of other concurrent awards. The Selection Committee may also consider the financial need of the candidate. This award is sponsored by the Pharmacy Association of Nova Scotia.

The Charles E. Frost Award: This award of \$500 is presented by Merck Frost Canada Inc. to an undergraduate student of outstanding merit in the third-year class.

The Charles E. Frost Medal: This medal is presented by Merck Frost Canada Inc. to the student who achieves the highest academic standing in the third-year class.

Hoechst-Roussel Canada Inc. Award: An award of \$1,500 is presented annually to an outstanding pharmacy student who has successfully completed one or more years at the College of Pharmacy.

Home Prescription Services Prize: This prize of \$200 is awarded annually to the student who obtains the highest standing in Physiology 4403R. To be eligible for this prize a student must have at least a GPA of 3.0.

The Frank W. Horner Medal: This medal is awarded to the pharmacy student who has attained the highest standing in the third year dispensing class.

The William Killorn Award: This award has been established by Shoppers Drug Mart Associates and the pharmaceutical industry to pay tribute to Bill Killorn in honour of his 46 years of service to pharmacy in Atlantic Canada. The award is presented annually to a

pharmacy student who, in the view of the College after consultation with the Killom family and the pharmaceutical industry, demonstrates strong leadership skills and excels in academic and extra-curricular activities.

The Honourable John J. Kinley Pharmacy Award: In order to be considered for the award, candidates must have satisfactory academic standing and show promise of contributing to the profession. The financial need of the applicant may also be considered by the Selection Committee. The net income from an established fund will be used to provide a monetary award as well as a book.

Eli Lilly Book Award: The firm of Eli Lilly Canada Inc. provides an award for a deserving student in either first or second year pharmacy. The award consists of the sum of \$200 and the current edition of Martindale's Extra Pharmacopoeia.

Dr. Jessie I. MacKnight-Miss Mona W. Fleming Award in Hospital Pharmacy: This award is administered annually to a student from New Brunswick and to a student from Nova Scotia who have completed outstanding work in the hospital portion of the practical training programme (Pharmacy 3000C) and in the third year dispensing laboratory class (Pharmacy 3100B). It is desirable that the recipients demonstrate an interest in hospital pharmacy practice.

The Donald R. MacLeod Prize: This prize of \$50, offered in memory of Mr. Donald R. MacLeod, a former pharmacist of New Glasgow, Nova Scotia (Class of 1930), is awarded to the student of the first year who attains the highest academic standing in the first-year classes of the Pharmacy courses. The purse of the prize is paid directly from the sponsor.

The Helen Corston Marshall Award in Pharmacy: This award is to be given annually to a student (or students) who has successfully completed one or more years of the course leading to a degree in pharmacy and who is enrolled in pharmacy at the University for the ensuing year. Candidates must have attained a satisfactory academic standing and must show promise of making future contributions to the profession of pharmacy. Financial need may be considered.

Medic Atlantic Medal: This medal is awarded annually to the student on graduation who has obtained the second highest aggregate mark during his/her four years at the College of Pharmacy.

Merck, Sharp and Dohme Pharmacy Award: This award, consisting of \$1000 and the books, The Merck Index and The Merck Manual, is presented to the student entering

the final year who has attained the highest standing in the pharmaceutical chemistry classes.

New Brunswick Pharmaceutical Society Centennial Medal: In conjunction with its 100th anniversary of incorporation, the Society has established this commemorative medal to be presented annually to the New Brunswick student who has attained the highest aggregate mark during his/her four years at the College of Pharmacy.

Novopharm Pharmaceutics Award: This award of \$500 is presented annually to the student who obtains the highest combined standings in the following classes: Physical Pharmacy (second year), Biopharmaceutics (second year) and Pharmacokinetics (third year).

The Nova Scotia Association of Certified Dispensers Prize: This prize, in the form of a book, will be awarded annually to the top student in the first year dispensing laboratory. The prize was established in 1984 with the gift of funds to provide the initial award and to set up an endowment to provide subsequent awards.

The Nova Scotia Pharmaceutical Society Centennial Awards: In conjunction with its 100th anniversary of incorporation, the Society has established two awards. Candidates will have a satisfactory academic standing and show aptitude for the profession. The financial need of the student may be considered in selecting recipients for the awards, each of which is \$500.

Nova Scotia Pharmaceutical Society Memorial Award: The Society has established this award in memory of past members and friends of the Society. It is available to a qualifying student who possesses good academic standing and aptitude for the profession. The financial need of the student may be considered in selecting the recipient for the award of \$1000.

The Parke-Davis and Company Prize for Pharmacy History: A prize of \$500 is presented annually to the student with the highest standing in the history portion of Pharmacy 1700B.

Warner-Lambert Self-Medication Award: An award of \$500 is presented by Warner-Lambert to recognize the pharmacy student who achieves the highest standing in course work related to over-the-counter drug products.

Practical Training Programme Prize: A prize is presented to a student completing the College of Pharmacy Practical Training Programme who has achieved a high level of

performance during the programme. Assessment will be based primarily on submitted assignments.

The B. Trevoy Pugsley Memorial Pharmacy Award: This award was established by a bequest from the Estate of B. Trevoy Pugsley for an undergraduate student who has completed one or more years of the pharmacy course. The criteria for the selection of the recipient are based on academic standing, aptitude for pharmacy and qualities of character. Financial need may also be considered.

The Mrs. Vera B. Pugsley Award: This award of \$500 will be presented annually to a student who has successfully completed one or more years of the course leading to a degree in pharmacy and who is enrolled in pharmacy at the University for the ensuing year. Candidates must have attained a satisfactory academic standing and must show promise of making future contributions to the profession of pharmacy.

John J. Ryan Pharmacy Administration Award: This award of \$200 and a suitable memento is presented annually to the student earning the highest mark in Pharmacy 4700A. This Award was made possible through income from the John J. Ryan Fund.

Sendoz Prize in Pharmacy: This prize is presented annually to the graduating student who obtains the highest standing in fourth year pathophysiology and therapeutics class (Pharmacy 4500R). The prize consists of an engraved plaque, a cheque for \$250 and a reference book.

Dr. Samar B. Singh Prize in Anatomy: An endowment fund has been established for the purpose of providing from the net annual income a prize to the highest standing student in Anatomy 101 among Nursing and Pharmacy enrollees. The prize, consisting of a book or books to the approximate value of \$100, is a memorial to Dr. Singh, a long-time member of the Department of Anatomy. The awardee will be selected by the Head of the Department.

The Leigh Semple Memorial Award: An endowment has been established to provide an annual award to a third-year pharmacy student who has demonstrated strong academic ability and involvement in student activities.

The Sister Frances dePaul Award: This award, consisting of a reference book or a subscription to a professional journal, is offered annually by the Nova Scotia Branch of the Canadian Society of Hospital Pharmacists and is presented to the student who attains the highest standing in the

hospital pharmacy class. To be eligible for this award a student must have achieved a GPA of at least 3.0.

SmithKline Beecham Pharma Inc. Award: Two awards of \$500 each will be presented annually to a student from Nova Scotia and a student from either New Brunswick or Prince Edward Island who have successfully completed one or more years of the course leading to a degree in pharmacy and who are enrolled in pharmacy at the University for the ensuing year. Candidates must have attained a satisfactory academic standing and must show promise of making future contributions to the profession of pharmacy.

Pharmacy's Canada Centennial Award (External): This award enables a student who is completing the third year to participate in the Canadian Pharmaceutical Association Conference and to visit governmental and industrial institutions. The award is based on acceptable academic achievement, participation, and leadership in student activities. The award is sponsored by the Canadian Pharmaceutical Association, Shoppers Drug Mart, and the Maritime provincial pharmaceutical societies and association.

University Medal in Pharmacy: This medal is awarded annually to the graduate who has obtained the highest academic standing in the pharmacy programme provided that she or he meets the requirements as set by the Faculty.

Wyeth Award of Excellence in Pharmacy Research: An Award of \$200 and a certificate will be presented to a fourth year student at the College of Pharmacy who completes the best research project in a given academic year. The research will usually be done in Pharmacy 4000R, 4010A, 4020A or B, or 4030C, but any paper completed by a fourth year student, which is deemed by the primary supervisor to be worthy of consideration for this Award, will be included in the competition. Each primary supervisor may submit no more than one paper. A committee will evaluate the research presentations in both a written and verbal form.

School of Nursing

Alumnae Award (Nursing): This award is open to graduating students in the Bachel or Post-RN programmes. The recipient will have achieved a Grade Point Average of 3.0 or better and have demonstrated clinical competency in the area of medical/surgical nursing in a hospital setting.

Dalhousie Basic Degree Certificate and Dalhousie Post-RN Degree Certificate: Information concerning these certificates may be obtained from the School of Nursing.

Final-Year Degree Award: A prize is awarded to the student in the graduating class who has achieved the highest academic standing. (On account of computer space limitations the older name has been retained on the code directory. In the School of Nursing this award is known as Prize for the Highest Academic Achievement in the Undergraduate Degree Programme.)

Halifax Children's Hospital Alumnae Prize: This prize is given by the Izaak Walton Killam Hospital for Children to the student who meets the approval of the criteria as established by the School of Nursing and the Izaak Walton Killam Hospital for Children in recognition of the student's work in the paediatric sector of the community.

The Lenta G. Hall Memorial Award: An award of \$100 is offered annually by the Registered Nurses' Association of Nova Scotia to a student in the School of Nursing under the terms to be determined by the Director of the School.

R.M. MacDonald and R.C. Dickson Prize in Outpost Nursing: A prize is awarded for the student achieving the highest academic record in the graduating class of Outpost Nursing students.

C.V. Mosby Book Prize: This award is given in recognition of a student's high academic standing and participation in the School.

NAMATH Leadership in Nursing Practice Award: This prize is given by the Nursing Administrators of the Metro Area Teaching Hospitals to the graduating Post-RN degree student who fulfils the approved criteria as established by the School of Nursing and the Nursing Administrators of the Metro Area for innovative approaches to nursing concerns.

Recognition Award for the Undergraduate Degree Programme: This prize is awarded by H.L. Recognition Services (Hario Recognition Ltd.) to the graduating student who demonstrates continued improvement and progress during the years of study. The criteria are to be determined by the School of Nursing.

Anna Trenholm Memorial Prize: A cash award has been donated by the family of the late Anna Trenholm (Diploma in Outpost Nursing, 1970; BN 1978). The prize is to be awarded annually to the student graduating from the Outpost Nursing Programme whose achievement in clinical practice has been outstanding.

W.B. Saunders Award (Nursing): This prize is presented to the student in the graduating class who has demonstrated progressive academic achievement and general proficiency. It is a one-year subscription to *Nursing Clinics of North America*.

Dr. Samar B. Singh Prize in Anatomy: An endowment fund has been established for the purpose of providing from the net annual income a prize to the highest standing student in Anatomy 101 among Nursing and Pharmacy enrollees. The prize, consisting of a book or books to the approximately value of \$100, is a memorial to Dr. Singh, a long-time member of the Department of Anatomy. The awardee will be selected by the Head of the Department.

The Stern Award: This prize was established to recognise the contribution of a graduating student to increased knowledge and participation of School members in an interdisciplinary international role.

University Medal in Nursing: This medal is awarded annually to the graduate who has obtained the highest academic standing in the Nursing programme provided that she (or he) meets the requirements as set by the Faculty.

School of Occupational Therapy

The Canadian Association of Occupational Therapists Book Prize: This prize is awarded annually to the graduating student with the highest academic standing in the theory of occupational therapy.

Foundation Travel Award: This award was established to recognise the founding of the School of Occupational Therapy. Presented annually to the President of the Dalhousie Occupational Therapy Student Society, the award provides funding to cover the cost of attending the annual Occupational Therapy Atlantic Conference. Funds for the award are provided by the professional organizations of occupational therapists in the four Atlantic provinces.

New Brunswick Association of Occupational Therapists Award for Achievement in Fieldwork: This prize is awarded annually to the graduating student who has shown outstanding achievement in fieldwork.

PEIOTS and PEIAOT Award: This prize is awarded annually to the graduating student with outstanding academic achievement in Advanced Professional Practice (TO 4419R) as well as an interest and involvement in community practice.

1992 Tenth Anniversary Award: This award will be presented annually to a graduating student who has demonstrated an

outstanding level of personal growth and professional development while in the occupational therapy program.

Nova Scotia Society of Occupational Therapists Student Society Award: This prize is awarded annually to the graduating student who has contributed most to the Occupational Therapy Student Society.

Newfoundland and Labrador Association of Occupational Therapists Book Prize: This prize is awarded annually to the student entering fourth year who achieved the highest standing in third year Therapeutic Procedures classes (TO 3305B, TO 3306A, TO 3307C and TO 3308C).

Nova Scotia Society of Occupational Therapists Book Prize: This prize is awarded annually to a student entering third year who has been selected by classmates on the basis of outstanding contribution to activities in both the School and the community, interpersonal skills and general scholarship proficiency.

Dalhousie Women's Alumnae Medal: The Women's Division of the Dalhousie Alumni Association sponsors an annual medal to be awarded to the graduating student with the highest cumulative grade point average in the occupational therapy program.

W.B. Saunders Book Prize: This prize is presented annually to the graduating student with the second highest cumulative grade point average in the Occupational Therapy programme.

Williams and Wilkins Book Prize: This prize is awarded annually to the entering fourth year with the highest academic standing.

C.V. Mosby Book Prize: This prize is awarded annually to the graduating student with the second highest standing in the final year of the Occupational Therapy programme.

The Sammons Award: This prize is awarded annually to the graduating student with the highest overall standing in statistics (Math 1060A), research methods (TO 4407A) and Independent Study (TO 4421R). Mr. F. Sammons gave the University a gift to be used at the discretion of the School, which decided to endow an award for a graduating student.

Sammons Research Award for Clinical Tutors: An endowment has been established to provide an annual prize to the clinical tutor who has assisted the graduating student who won the Sammons Award for their independent research project.

Class of '85 Award: This prize is chosen annually to a graduating student (as chosen by the members of the graduating class) who

has made an outstanding contribution to activities of the class, School, University and community.

The Cardwell/Robinson Prize: An endowment has been established from which the net annual income will support a prize. The award is presented to a student entering fourth year who has achieved the highest standing in courses dealing with psychiatry and mental health (TO 3302C and TO 3307C).

The Norma Cassidy Prize: This award is presented annually to a student entering fourth year with the highest academic standing in Therapeutic Procedures (Rehabilitative, TO 3306A).

Dalhousie Occupational Therapy Student Involvement Award: This award was established by the Occupational Therapy Student Society from a donation by the Dalhousie Student Union through their Capital Campaign pledge. The prize will be presented annually to a student entering the fourth year who shows financial need and who has been actively involved in the Occupational Therapy Student Society and other School activities. One award of \$500 will be made from income generated by the endowment.

School of Occupational Therapy Prize in Kinesiology: This prize will be presented annually to the student entering Third Year with the highest standing in class OCCT 2210C (Kinesiology).

University Medal in Occupational Therapy: This medal is awarded annually to the graduate who has obtained the highest academic standing in the occupational therapy programme provided that she or he meets the requirements as set by Faculty.

School of Physiotherapy

Fourth Year

Canadian Physiotherapy Association Award: A certificate and first-year membership in the Canadian Physiotherapy Association constitute this annual award. It is presented to the graduating student who has achieved the highest aggregate percentage in academic and clinical physiotherapy subjects during the entire programme.

Canadian Physiotherapy Cardiorespiratory Society Book Prize: A book prize to the approximate value of \$60.00 is offered to the third-year Physiotherapy student who has achieved the highest standing in the Cardiorespiratory class, PT 3050.

The Patricia Stanfield Covert Award in Physiotherapy: An endowment has been established to provide an annual prize to a physiotherapy student who is entering the

final year of the programme. The recipient is to be nominated by classmates on the basis of extra curricular activities, interpersonal skills and scholarship proficiency.

Morris B. Kohler Award in Physiotherapy: This prize is awarded to the student in the graduating class who has demonstrated the greatest interest in the treatment of long-term rehabilitation patients, while attending the Nova Scotia Rehabilitation Centre.

Hazel Lloyd Foundation Book Prize: The Hazel Lloyd Foundation has been established by Miss Aphra Lloyd in memory of her sister, Miss Hazel A. Lloyd (1930-1985), Associate Professor, School of Physiotherapy. Friends, associates and alumni have made additional contributions. The purpose of the Foundation is to foster interest in geriatrics and gerontology, Professor Lloyd's major areas of interest. The Hazel Lloyd Foundation will award an annual Book Prize to the student with the highest marks in PT4120A, Gerontology and Geriatrics.

Jean McAloney Memorial Prize: This prize is awarded annually to the student in the graduating class who has demonstrated the highest clinical standing. The prize is sponsored by the New Brunswick Association of Physiotherapists.

Newfoundland and Labrador College of Physiotherapists Prize: This prize is awarded to the physiotherapy student who has attained the highest standing in Orthopaedics. It is sponsored by the Newfoundland and Labrador College of Physiotherapists.

Newfoundland and Labrador Physiotherapy Association Prize: This prize is awarded to the member of the graduating class who has attained the highest standing in Neuroscience. It is sponsored by the Newfoundland and Labrador Physiotherapy Association.

Nova Scotia College of Physiotherapists Book Prize: The College sponsors an annual cash prize for books to the third-year physiotherapy student who has demonstrated the greatest degree of leadership within her/his class during the second and third years within the School of Physiotherapy.

Nova Scotia Neurosciences Section Book Prize: The Nova Scotia Section of the Neurosciences Division of the Canadian Physiotherapy Association established a prize of \$50, effective with the 1984-85 session. The prize will be presented to the fourth-year Physiotherapy student with the highest combined grade from (1) the practical exam in third-year neurology course and (2) the average grade of the third-year and fourth-year clinical neurology placement(s).

The recipient will be selected by the Dalhousie Professor who is managing the neurology course.

Third Year

Nova Scotia Physiotherapy Association Prize: This prize is awarded annually to the student who shows the greatest overall improvement during the third year of the BSc Physiotherapy programme.

Second Year

Prince Edward Island Physiotherapy Association Prize: This prize is awarded annually to the student who has attained the highest academic standing in Gross Anatomy.

University Medal in Physiotherapy: This medal is awarded annually to the graduate who has attained the highest academic standing in the physiotherapy programme, provided that he or she meets the requirements approved by the Senate of Dalhousie University.

School of Recreation, Physical and Health Education

Beaver Foods Awards: Under the sponsorship of Beaver Foods Limited the School of Recreation, Physical and Health Education is able to offer two \$1000 entrance awards to students registering in this School for the first time. Winners will be selected from applicants who possess a strong background in academic performance and potential for contributing to extra-curricular activities. Further information may be obtained from the Director of the School of Recreation, Physical and Health Education.

Arthea Bellemare Award for Excellence in Student Teaching: The School selects for this award the graduating student in the Bachelor of Physical Education/Bachelor of Education programme who has demonstrated the highest degree of performance in student teaching activities.

The E.G. Belzer Jr. Prize: In 1986 colleagues and former students of Dr. E.G. Belzer Jr. established a prize that is to be awarded to the undergraduate health education major who is adjudged to have written the best paper among those submitted to health education courses. The adjudication is held annually, at mid-April. The prize will be a book chosen by Health Education Division faculty members. The prize is also open to graduands.

Canadian Association of Sports Science Award: The CASS provides an annual medal to the School to be awarded to an outstanding student in the Bachelor of Science in Kinesiology programme. The

recipient will be the graduating student who has achieved the highest cumulative Grade Point Average over the duration of her/his academic record.

Canadian Association for Health, Physical Education and Recreation Student Award: This award is presented to a second- or third-year student who has demonstrated a significant involvement in the SAPHER organization and by so doing has demonstrated a commitment to the advancement of professional principles supported by CAPHER.

The Dr. M.J. Elle Award: This award was established to give recognition to a graduating student who demonstrated exceptional interest and ability in research in one of the four undergraduate degree programmes.

Duane Ervanowitz Memorial Award: This memorial book prize is awarded to the graduate in the Recreation programme who is deemed to have an exceptional interest in and dedication to conservation and outdoor recreation.

Health Education Awards: Consisting of one-year subscriptions to a Health Education journal of the student's choice, there are two awards, one for each of years One and Two of the BSc Health Education programme. The awards are made to the student in each year who has achieved the highest GPA.

Leisure Research Congress Award: The Fifth Canadian Congress on Leisure Research set up an endowment to provide an annual award to a student who has graduated from the Bachelor of Recreation programme. The recipient will have attained a cumulative Grade Point Average of 3.0 or higher and will have demonstrated an aptitude for research related to recreation and leisure. The awardee must be planning to register in a graduate programme in Leisure Studies at Dalhousie University in the academic year following receipt of the award.

The Dr. Hugh A. Noble Award: This award is given to a graduating student from one of the four undergraduate degree programmes in the School of Recreation, Physical and Health Education. The awarding is based on academic accomplishments, qualities of citizenship as shown by involvement outside the University, leadership qualities as demonstrated in activities inside the University, and an estimate of the candidate's potential for contributing to the profession.

Thomas Family Prize: The Nova Scotia Heart Foundation and the Thomas family have established an award which is open to graduating students in the Health Education

programme (BSc or MA). Candidates will have shown dedication to the field of heart health through volunteer work in community health promotion, demonstrated a commitment to a healthy lifestyle, and achieved a commendable level of academic performance.

University Medal in Recreation, Physical & Health Education: This medal is awarded annually to the graduate who has obtained the highest academic standing in the physical education programme provided that she or he meets the requirements as set by the Faculty.

The Women's Division of the Dalhousie Alumni Association RP&HE Medals: Four awards are available to students in the School of Recreation, Physical and Health Education. For the students who achieve the highest standing in each of the Bachelor of Physical Education, the Bachelor of Recreation, the Bachelor of Science in Health Education and the Bachelor of Science in Kinesiology degree, the Women's Division sponsors of a medal.

The A.J. "Sandy" Young Award: This award is open to the graduating student who makes the greatest contribution each year to the advancement of "Nova Scotia Sport Heritage". Both undergraduate and graduate students are eligible.

Maritime School of Social Work

Dalhousie University Women Alumnae Medal: This medal is presented annually to the graduating student with the highest cumulative grade point average in the baccalaureate programme in the Maritime School of Social Work.

Faculty of Management

Commerce

The Wilfred Berman Memorial Prize: The Wilfred Berman Memorial Prize is payable from the income of a fund provided by former students of the late Professor Wilfred Berman to the student obtaining the highest mark in the class in first-year Accounting.

Commerce Alumni Association Awards: The Commerce Alumni Association sponsors four annual awards to recognize academic achievement. There is one award for each of Accounting, Finance, Management and Marketing.

The Stewart Lookie Gibson Memorial Prize: The School of Business Administration offers a prize to the graduating student in the general Bachelor of Commerce programme who has achieved the highest standing.

University Medal in Commerce: The School of Business Administration offers to the top

First Class Honours graduate in the Bachelor of Commerce programme a medal. The awardee will be one who has fulfilled the high scholastic standard for this award.

Financial Aid, Loans, and Bursaries

Dalhousie Bursaries

Students who are eligible under the Canada Student Loans Act must have applied for a Canada Student Loan in order to be considered for a Dalhousie bursary.

Application forms are available at the Office of the Registrar, Room 133, Arts & Administration Building, after October 1st, until the end of the regular session (April 30th).

Students may apply for University bursaries during the Summer Session beginning May 1st, and ending August 31st.

Completed applications are batched and assessed on a comparative basis for available funds. Applicants are sent written notification of the decision.

Please note that most University undergraduate bursaries are restricted to Canadian citizens and permanent residents.

It should be noted that Canada Student Loans (with or without provincial bursaries and/or loans) are expected by provincial authorities to meet the financial deficiencies of the students. Bursaries subsequently awarded by the University must be reported and are liable to be deducted (in part or in whole) from the amounts originally allocated under the Canada Student Loan Plan or provincial aid programme.

The University has at its disposal funds which are selectively awarded as bursaries to students who may unexpectedly find themselves in need of financial assistance. While these bursaries are awarded primarily on the basis of demonstrable need, satisfactory academic standing is also expected. Except under exceptional circumstances, bursaries will not be awarded to fulltime students who have not availed themselves of assistance under the federal/provincial student aid programmes.

In the event that the applicant may be eligible for a restricted bursary, he/she should annotate the application.

Government Notification

Holders of Dalhousie University bursaries are to note that the University is required, upon written request, to report its award winners to the respective provincial Student Aid Authority.

Government Student Loans

Addresses of Provincial Student Aid Authorities

Canadian students, other than Quebec residents, are to apply for government assistance to the appropriate agency in that province or territory in which the applicant is a bona fide resident. The addresses for Canada Student Loan authorities of those provinces and territories participating in the plan are listed below:

Alberta:

Alberta Students' Finance Board
10th Floor, Baker Centre
10025-106 Street
Edmonton, Alberta
T5J 1G7
(403) 427-2740
(403) 422-5583
(status of application only)

British Columbia:

Student Services Branch
Ministry of Advanced Education,
Training and Technology
2nd Floor, 1106 Cook Street
Victoria, British Columbia
V8V 3Z9
(604) 387-8100
or
(604) 387-8101

Manitoba:

Student Financial Assistance Branch
Manitoba Education and Training
Box 6, 693 Taylor Avenue
Winnipeg, Manitoba
R3M 3T9
(204) 945-8321
or
(204) 945-8322

New Brunswick:

Student Services Branch
Department Of Advanced Education and
Training
P.O. Box 6000
Fredericton, New Brunswick
E3B 5H1
(506) 453-2577

Newfoundland:

Department of Education
Student Aid Division
Thompson Student Centre
Memorial University of Nfld.
St. John's, Newfoundland
A1C 5S7
(709) 728-4235

Northwest Territories:

Manager-Student Services
Department of Education
Government of the Northwest Territories
Yellowknife, Northwest Territories

X1A 2L9
(403) 873-7190
or
1-800-861-0793

Nova Scotia:
Student Aid Office
Department of Advanced Education and
Job Training
P.O. Box 2290, Station M
Halifax, Nova Scotia
B3J 3C8
(902) 424-8420
(Street location: Trade Mart Building 2021
Brunswick at Cogewell Streets Halifax, N.S.)

Ontario:
Student Support Branch
Ministry of Colleges and Universities
P.O. Box 4500
Thunder Bay, Ontario
P7B 6G9
(807) 343-7280

Prince Edward Island:
Student Aid Office
Department of Education
P.O. Box 2000
Charlottetown, Prince Edward Island
C1A 7N8
(902) 368-4840

Saskatchewan:
Student Financial Assistance Branch
Saskatchewan Education
1855 Victoria Avenue
Regina, Saskatchewan
S4P 3V5
(306) 787-5820

Yukon Territory:
Students' Financial Services
Department of Education
P.O. Box 2703
Whitehorse, Yukon Territory
Y1A 2C8
(403) 667-5310
or
(403) 667-5929

The above authorities also administer provincial bursary and loan plans in conjunction with the Canada Student Loan, if applicable.

Québec:
Residents of Québec Province are to apply to:
Ministère de l'enseignement supérieur
et de la Science
Direction générale de l'aide financière
aux étudiants,
1033, rue de la Chevrotière
Québec, Québec
G1R 5K9
(418) 643-3750

Short-Term Loans

For Dalhousie Students Generally

Temporary Loans: The University has established a temporary loan programme to assist registered Dalhousie students with certain types of short-term financial difficulty when no other reasonable resource is available. (Such loans are not made for fee payment, however.) These loans have a short interest-free period, after which interest will be charged. Refer to the information sheet attached to the Temporary Loan Application for further details. Applications may be picked up in the Office of the Registrar, Room 133, A&A Building and handed in to the Information Centre, Room 123, A&A Building.

For Occupational Therapy Students

Short-Term Loans for Occupational Therapy Students for Fieldwork: Full-time students in Third Year or Fourth Year are eligible to apply for loans up to \$500. The first priority is for Third-Year students who are about to undertake fieldwork 4420 A or B; the second priority is for Fourth-Year students who are about to undertake fieldwork 4421R. Students who seek such assistance are to apply to: Office of the Registrar, Awards, and to present a letter of support from either the Director of the School or the Fieldwork Co-ordinator of the School. Further information is available at the Awards Office or the School of Occupational Therapy.

Arts & Science Specified as to Year

First Year

Alfred George Darville Memorial Bursary: This fund provides one bursary to a qualifying Dalhousie student. Applicants must be matriculants of Halifax West High School, be enrolled in first-year studies in an undergraduate programme (as commonly understood), and demonstrate financial need to the satisfaction of the Selecting Body.

The John Dunlop Memorial Bursary: An endowment was established to provide bursaries in first year.

The Rev. Kenneth Mackenzie Bursary: Mrs. Harriet Mackenzie Morrison of Stornoway, Scotland, daughter of the Rev. Kenneth Mackenzie of Pictou County, bequeathed \$1,000 to the university in 1887 to be used as a bursary fund. Candidates of the name of Mackenzie, MacLean, or Fraser are to be given preference.

Elizabeth McKenna Bursaries: The Elizabeth McKenna Scholarship Fund was established in 1928 for the purpose of providing what are known today as bursaries. Applicants must

be bona fide residents of one of the Maritime Provinces and be entering the first year in the College of Arts & Science.

North British Society Bursaries: Eight major bursaries are open to candidates from provincial high schools who have been accepted for full-time study in the College of Arts and Science. The Selection Committee will assess candidates on the basis of the following criteria: academic achievement, extracurricular participation and demonstrated financial need. Applicants may obtain the designated application form at the Awards Office, and are to return the completed forms to this office by the May deadline. The bursaries are provided by the North British Society which for many years has been dedicated to the preservation of the Scottish tradition in Nova Scotia. The association between the Society and Dalhousie University derives in particular from the role of Scots in the foundation and development of the University during its first sesquicentennial. The following bursaries each in the amount of \$500 are available: the Sir Joseph A. Chisholm Bursaries (two), the NBS Centennial 1868 Bursary (one), the NBS 1958 Bursary (one), the NBS 1963 Bursaries (two), and the NBS 1964 Bursaries (two). (under review)

Fourth Year

Prof. W. Russell Maxwell Memorial Bursaries: Any residual income remaining in the Fund after the annual scholarships have been determined may, after consultation with the Department of Economics, be used to fund one or more bursaries for deserving students entering the fourth year of the Honours programme in Economics.

Unspecified as to Year

Ernest Brehaut Memorial Bursaries: These bursaries were established by the gift of Mrs. Ernest Brehaut of Colorado Springs, USA, in memory of her husband, a distinguished graduate of Dalhousie, Harvard and Columbia. These bursaries are to be awarded by the Awards Office of the University, which will take into consideration any financial need of the applicant, to students from Prince Edward Island. Preference is to be given to relatives of the late Dr. Brehaut. The bursaries are to be continued throughout the courses of the students if they maintain creditable academic standing and show genuine need.

The Robert Bruce Bursaries: Several bursaries tenable in the third year of an Arts or Science course, will be awarded to students of promising abilities but of straitened circumstances.

James and Abbie Campbell Bursaries: Dalhousie students who are engaged in

studies in one of our music programmes are eligible for consideration for a bursary from this fund.

David Andrew Dougall Memorial Bursary: The intent of this award is to encourage and assist one or more students whose academic and financial status merit consideration. The Department of Biology administers the fund.

Wilfred E. Hillie Bursary: The late Mrs. Olga Munro Hillie made provision for the establishment of the Wilfred E. Hillie Bursary Fund. The income derived therefrom is to be used as bursaries for worthy Arts and Science students who are in need of financial assistance.

Annie S. MacKenzie Class of 1911 Bursary: Under the Will of the late Emelyn L. MacKenzie the University has been given a bequest to provide bursaries in Arts & Science, Dentistry and Law. One-third of the net income is allotted to the College of Arts and Science for the purpose of funding a bursary to one or more students. The recipient must be a bona fide resident of and domiciled in the County of Victoria (as defined by the boundaries then extant in AD 1900), Nova Scotia. Character and financial need are the main criteria.

John David and Ellen Matheson Allen Endowment Fund: The bursaries to be known as John David and Ellen Matheson Allen bursaries, are in memory of John David Allen and his wife, Ellen Margaret Allen, both graduates of the Department of Education of the University. The bursaries are for students in the Arts and Science faculties and the School of Education of Dalhousie University. In the selection of the recipients of the bursaries, priority is to be given to Canadian Indians and Inuit, but where no such persons apply, the bursaries are to be given to other applicants as determined by the appropriate office of the University.

The Kenneth and Lloyd McDonald Bursary: A gift of the McDonald family in 1976 makes possible the funding of an annual bursary to a deserving and needy student.

Reverend J.W.A. Nicholson Bursaries: This Fund was established in commemoration of the unselfish life of a distinguished Dalhousie graduate (BA 1897). One of his concerns was to help young people discover their talents. About half the annual income is used to assist Nova Scotia Blacks who are full-time students in the College of Arts & Science at Dalhousie, and the balance is added to the fund's capital. Awards are made at the discretion of the Awards Office.

Divinity Candidates

Dr. Alexander E. Kerr Bursary: The Alexander E. Kerr Foundation Fund was established to

provide a biennial bursary of \$500 to qualifying students to continue their theological studies within three years of having been graduated from Atlantic School of Theology and Dalhousie University. A Committee on Awards shall select one person from the applicants who must have been accredited candidates for the Ministry of the United Church of Canada. Each bursary shall be for one academic year. Additional information is available at Atlantic School of Theology and the Awards Office at Dalhousie University. Applications must reach the Director of Awards, Office of the Registrar by the first Monday in April. [Under review]

Robert Archibald MacDonald Bursaries: Candidates must be properly qualified students taking the Arts course in Dalhousie with a definite intention of proceeding to Theology at the Atlantic School of Theology in preparation for a ministry in the United Church of Canada. The bursaries are awarded by a committee of Dalhousie and Pine Hill representatives. First preference will be given to students from Cape Breton and then to those from Pictou Presbytery. [Under review]

R.B. and Annie J. MacLennan Bursaries: Candidates must be registered as students at Dalhousie University and must be certified as intending to pursue their studies in Theology at the Atlantic School of Theology in preparation for a ministry in the United Church of Canada. Those students who are awarded a bursary may be eligible for a renewal of the award in a succeeding year. [Under review]

The Ross Miller Bursary: Under the will of Dr. Ross Miller the sum of \$10,000 was bequeathed to the Board of Governors in trust to set up a bursary to be awarded annually. It is stipulated that "Other things being equal the recipient shall be an undergraduate in Arts or Letters who is qualifying himself for the Ministry of the Presbyterian Church in Canada by taking the Arts or Letters degree at Dalhousie." The Synod of the Presbyterian Church in the Maritime Provinces will present the names of the candidates to the Awards Office, and the necessary scholastic requirements will be decided either at the matriculation examinations or by ability as shown by the sessional examinations.

Faculty of Health Professions

College of Pharmacy

Please note that the College administers the following bursaries except the one listed as University Bursaries.

P.A.C.E./Apotex Inc. Bursaries: Two bursaries of \$750 each are offered annually

by Apotex Inc. for students who have completed at least one year at the College of Pharmacy. The students must have a satisfactory academic standing and demonstrate financial need.

Boehringer Ingelheim (Canada) Ltd. Bursary: This bursary of \$500 is awarded to a pharmacy student entering third- or fourth-year classes who demonstrates financial need.

The Bert and Betty Collins Bursary: A fund has been established to award an annual bursary to a deserving pharmacy student from New Brunswick who demonstrates financial need and who has attained a satisfactory academic standing.

The Jack Kidd/ANCA Bursary: This award was established (as a scholarship until 1986-87) in 1982 to recognize 43 years of service of Mr. Jack Kidd, a pharmaceutical sales representative, with Anca Inc. It is awarded to a student from New Brunswick or Prince Edward Island who has successfully completed one or more years of the course leading to a degree in pharmacy and who is enrolled in pharmacy at the University for the ensuing year. The student must have a satisfactory academic standing and demonstrate financial need. Applications are available at the College of Pharmacy and must be submitted by 1 May.

Lawton's Drug Stores Limited Bursary: This bursary of \$500 is awarded to a second, third or fourth year student from the Atlantic Provinces, who has attained a satisfactory academic standing and who demonstrates financial need. Applications are available from the College of Pharmacy and must be submitted by 1 May.

George MacDonald Bursary: This Bursary is awarded to a deserving pharmacy student, from the Atlantic Provinces who has satisfactorily completed at least one year of study at the College of Pharmacy and who demonstrates financial need.

New Brunswick Pharmaceutical Society Bursaries: The New Brunswick Pharmaceutical Society offers four bursaries to be awarded to the students from New Brunswick completing the first, second, and third years of the Pharmacy course. The amount of each bursary is \$300. The bursaries are awarded on the basis of need to those students whose academic achievement, promise, and character are acceptable. Applications are available from the College of Pharmacy and must be submitted by 1 May.

The Pfizer Bursary: This bursary of \$500 is awarded to a deserving student who demonstrates financial need and who has

attained a satisfactory academic standing. Applications are available from the College of Pharmacy and must be submitted by 1 May.

Shoppers Drug Mart Community Pharmacy Bursaries: Shoppers Drug Mart will sponsor three bursaries of \$600 each to awardees selected by the College. The selection committee will consider candidates on the basis of financial need, student involvement, academic proficiency and potential for contributing to the pharmacy profession. Normally, successful applicants will have completed the first year. Applications are available from the College of Pharmacy and must be submitted by 1 May.

School of Occupational Therapy

Phyllis Aida Daly du Fresne Kennedy Memorial Bursary Fund was established in 1983 to provide from the annual income one or more bursaries to assist a student or students in Occupational Therapy in the fourth year. The applicants must show financial need, must have achieved a minimum GPA of 3.0 in each of the second and third years, and must demonstrate interest in their studies and the School. The Awards Office will assess applicants' needs and forward the name(s) of candidate(s) to the School's Committee on Studies for final selection. The decision will be announced through the Awards Office.

NOTE: TO students who need assistance with their fieldwork costs are referred to the entry on short-term loans.

School of Recreation, Physical and Health Education

The Jeff Bredin Memorial Bursary: An endowment has been set up to provide bursaries to deserving students. Preference will be given to a varsity athlete at Dalhousie who has successfully completed at least one year of study at this University. In any one year the maximum award given to any student will be \$1,000. Consideration is based on financial need, contribution to varsity sport and academic standing. Apply to the School of Recreation, Physical & Health Education.

Denton Hurdle Memorial Bursary: An endowment has been established to honour the memory of Denton Gordon Clifford Hurdle (B.Phys. Ed. '80) by providing a bursary to a student in the School. The student must be a Bermudian citizen and, preferably, a graduate of Warwick Academy, Bermuda. The student must have achieved an academic average of at least 80% (or the equivalent in the Bermudian School system) in the year in which application is made. The student must

have demonstrated a capacity to contribute to the University community through qualities of leadership and athletic ability.

Maritime School of Social Work

Hannah G. Matheson Bursaries: These bursaries are open to students enrolled in studies in the Maritime School of Social Work at either the undergraduate or graduate level.

Lloyd MacInnis Memorial Bursary: The Lloyd Y. MacInnis Memorial Award Fund was established to provide an annual bursary to a qualifying student who is continuing his or her studies at the School in the baccalaureate programme beyond first year.

Jane Wisdom Memorial Bursary: When Jane Wisdom began her caring work in Halifax shortly before the Great Explosion of 1917, she was truly a pioneer in what has come to be known as Social Work. It is in recognition of her distinguished service that Anonymous Donors in 1977 established an endowment fund whereby one or more annual bursaries to one or more deserving students would be granted to students in the baccalaureate programme of the Maritime School of Social Work at Dalhousie University.

Faculty of Management

Bachelor of Commerce Programme

E.J. McConnell & Associates (Atlantic) Bursary: This Company sponsors an annual bursary of \$1000 to be awarded to a student in the Bachelor of Commerce programme on the basis of financial need. The recipient will have achieved satisfactory standing.

Unspecified or Selected Faculties

The Eva and David Ashkine Memorial Bursary: The donors established this fund for the purpose of assisting pupils who have matriculated from selected high schools to enter Dalhousie. These high schools are (first) the North Queen's Rural High School or Bridgewater High School, and (secondly) other high schools in the province of Nova Scotia. The recipient may be considered in subsequent years for further assistance.

The Birks Family Foundation Bursaries: The Birks Family Foundation has established a plan of annual contributions to the Student Aid Fund of recognized Canadian universities for the creation of the Birks Family Foundation Bursaries. The Bursaries are awarded by the Foundation on the recommendation of the Awards Office and are not restricted to faculty or year and may be renewed. The number and amount of such awards may vary annually, depending upon the funds available for the purpose from the Foundation.

The Jotham Blanchard Bursary: The New Glasgow Literary and Historical Society in 1912 established this bursary in memory of Jotham Blanchard. The bursary will be awarded to a student of meritorious standing who is in the sophomore year of an undergraduate programme.

George Boyd Bursary: The income from the George Boyd Trust will provide an entrance bursary. Preference is to be given to a needy student from the Sydney area.

Enid Hager Clarke Textbook Fund: A bequest from the Estate has set up an endowment from which to award bursaries to assist students from certain geographic areas of New Brunswick. Students who are domiciled in King's and Saint John counties are eligible under the terms of the bequest.

The Rebecca Cohn Bursary Fund: A gift of \$4,000 by the executors of the Estate of the late Rebecca Cohn provides an endowed bursary fund for needy students.

Lenore Smith Cumming Bursary: From the Estate of Charles Gordon Cumming came a bequest of US \$10,000 to endow a bursary fund to assist needy students. Mr. Cumming expressed a preference for matriculants from Naparima College in Trinidad should such students attend Dalhousie.

Dalhousie Alumni Association Bursaries: The Alumni have established an endowment to provide bursaries for first-year undergraduate students and refugee students at Dalhousie University. Six bursaries of \$500 each will be awarded annually. Four of the bursaries will be awarded to first-year undergraduates who are not in receipt of any other University awards or bursaries and who satisfy the following criteria:

- i) achieved a minimum 75% average in his/her last year of high school;
- ii) shown considerable extracurricular involvement and leadership; and
- iii) demonstrated financial need.

The remaining two bursaries will be awarded to refugee students sponsored by the University. If, in any year, there are no refugee students attending Dalhousie, these two awards shall be made in the same way as the other four. [Note: This fund is administered by the Alumni Office.]

Dalhousie Leadership Bursaries: A limited number of bursaries are available annually to students who have exhibited a record of considerable leadership achievement. Candidates must also demonstrate consistent satisfactory academic accomplishment. The Selecting Committee may consider such other matters as financial need, service to the

University and the community, and character. Application forms are available at the Office of the Registrar.

Dalhousie Memorial Bursary Fund: From time to time at Dalhousie contributions have been made to the University as a memorial subscription in honour of some student or former student. Until now there has been no proper place into which these funds could be channelled. Because of these occurrences a Dalhousie Memorial Bursary Fund has been established. The existence of the fund will be commemorated by a book of remembrance to be located in a prominent place in the Killam Library. Names of persons in whose memory contributions have been made by relatives, friends, individuals or groups, to the Memorial Fund will be recorded in the book, along with the date of their birth and death. The pages would be turned on a regular basis. All money contributed to the Fund will be invested by the Board of Governors and only the investment income will be awarded. The award will be available to any full-time Dalhousie student, already registered and in attendance at classes, who can show a need for additional support. A student in straitened financial circumstances may be considered for possible assistance by making application on the standard undergraduate bursary application form which is available from the Office of the Registrar.

All contributions to the Memorial Fund are directed through the Dalhousie Annual Fund. For further information please contact the Development Office, Dalhousie University.

The Frank R. Davis Memorial Bursaries: The terms of this fund have been revised in consultation with the donor's family. Now income from this fund may be awarded on the basis of financial need. One or more bursaries may be made in consultation with the Supervisor of Schools for Bridgewater, Nova Scotia.

Annie M. Harrison Bursary: The annual income from the bequest of \$5,000 from the Estate of Annie M. Harrison provides a number of bursaries.

Alice M. Haverstock Bursary: From the Estate of Gertrude H. Fox came a bequest to endow a bursary fund in the name of Alice M. Haverstock.

Frances Havergal Grant Bursaries: An endowed bursary fund was established under the Will of the late Constance Patricia Hamilton in the amount of \$18,900, the income from which is to be used to assist students.

The Annette S. Hill Bursaries: The University received an endowment under the Will of the

late Annetta S. Hill to set up a fund, the income therefrom to be used to assist needy students.

The Nell and Jessie Matheson Bursaries: Established under the Will of Miss Margaret J. Matheson, Truro, the income from this fund provides several bursaries. Students from the rural districts of Pictou County are to be given preference.

Military District No. 6 Provost Corps Bursary: The Number 6 Provost Mutual Association established this bursary fund to assist descendants of those members of the Canadian Provost Corps who served in Military District No. 6. Applicants must fulfil the Corps' selection criteria, show satisfactory academic progress and demonstrate financial need.

The Warren Publicover Class '25 Memorial Bursary: The Warren Publicover Class '25 Memorial Fund was established in memory of Warren Publicover. The annual income from this fund is to be awarded in the form of a bursary for an individual who has successfully completed one year of university work at Dalhousie and is continuing as a full time student at this University. The bursary is to be awarded on the basis of satisfactory academic performance and demonstrated financial need, and is subject to renewal provided that the original requirements are maintained. It is a condition of the gift that applicants for this bursary need not have availed themselves of governmental funding as is usually required by the University.

3M Canada Bursary: Since 1980-81 3M Canada Inc. has sponsored an annual bursary of \$500 to assist an outstanding student in commerce or science. The bursary has been assigned to entrance.

Dr. Gerald Turner Bursary: An endowment has been established to provide a bursary to assist a needy student from Cape Breton in First Year.

Women's Division Bursaries: A number of bursaries, based on financial need, will be offered directly from the Women's Division of the Dalhousie Alumni Association. Application forms will be available at the Awards Section of the Office of the Registrar. Applicants are to forward their completed forms to the Chair of the Scholarship Committee, Women's Division, c/o Alumni Office, Dalhousie University, 6250 South Street, Halifax. Applications are to be submitted by either mid-October or the end of January.

Continuing Education Awards and Bursaries

Students who are engaged in part-time studies for credit are eligible to be considered for awards and financial assistance. Each of these is described briefly below.

The Frederick Thomas Parker Award for Part-Time Studies: This award will provide an appropriate and flexible means of encouraging students intending to undertake degree or diploma studies at Dalhousie on a part-time basis. The selection committee will take into account both academic performance and financial need, depending upon circumstances. Applications are available at Henson College.

Canada Student Loan for Part-Time Students: This particular federal loan is intended to help students who have a small cash-flow problem at the beginning of their studies. In order to qualify on the basis of class load for a standard academic year, a student must be planning to take not greater than the equivalent of 2.5 whole classes. The application form is available from Nova Scotia Student Aid Office, and is to be completed in part by both the Student Accounts and Awards Offices. Please note that repayment of the loan begins 30 days following the borrowing of the funds, and payment must be completed within 24 months.

Canada Student Loans Plan: Some students who are "part-time" by the University criterion are still eligible for the regular Canada Student Loan. The class-load criterion for this loan is to enrol and to maintain a class-load of not fewer than three whole classes or the equivalent. Repayment of the loan normally begins six months after the time one ceases to be a "full-time" student according to governing regulations. During the summer months application kits will be available at the Awards Office on a pick-up basis. (These kits are available for pick-up or mail-out directly from Student Aid throughout the CSL assistance period.) Interested individuals may seek further details from the Office of the Registrar - Awards (telephone 494-2416).

Dalhousie University Bursaries: Students who are engaged in part-time studies for credit will be considered for bursaries. Application is to be made at the Office of the Registrar - Awards. Please note that most University bursaries are restricted to Canadian citizens or permanent residents.

Dalhousie Temporary Loans: Students who are engaged in part-time studies for credit will be considered for temporary loans. Such loans are intended for short-term needs, and

repayment begins after the expiration of a predetermined grace period. Application is to be made at the Office of the Registrar.

University Regulations

General

1. The Senate is charged with the internal regulations 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, Physiotherapy and Nursing 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.
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 May 1 will not receive their degree/diploma parchment nor their transcripts. 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". The University will not release copies of transcripts if students owe monies to the University.

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 offenses 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 offenses (as delegated to the Senate Discipline Committee), as well as with certain other offenses 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 offenses 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 offense, 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 offense 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 evading 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 offenses 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 offenses 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:

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

Elaboration

- 1). 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:

- (a) using the computer access privileges of others without their explicit approval;
 - (b) accessing, copying, or modifying the files of others without their permission; and
 - (c) 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 programs 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 access privileges.

- Passed by Dalhousie Senate, 24 November 1986.

Academic Regulations

These regulations apply to all students in the College of Arts and Science and the Faculties of Health Professions and Management. Students in the Faculty of Health Professions should also consult the regulations specific to their school or college found in the appropriate sections of this calendar.

Please Note:

- a) A student is governed by the regulations in place at the time of initial enrolment as long as the degree is completed within the time permitted (see section 17, p. 92), and that subsequent changes in regulations shall apply only if the student so elects. Students applying the old regulations should consult the calendar of the appropriate year.
- b) It is a student's responsibility to maintain documentation of registration and subsequent changes. For environmental and financial reasons, the Registrar's Office will rely solely upon computer records and will not maintain paper records of changes to a student's registration.

1. Definitions

For definitions of some commonly used terms, see page 3.

Within these regulations, reference to the Student Appeals Committee should be interpreted as the Student Affairs Committee in the Faculty of Arts and Social Sciences, as the Committee on Studies and Appeals in the Faculty of Science, the Bachelor of Education Committee in the School of Education, the Undergraduate Committee on Studies in the Faculty of Health Professions, and the Undergraduate Academic Appeals Committee in the Faculty of Management.

2. Faculties/Colleges

2.1 College of Arts and Sciences

- Biochemistry (also in the Faculty of Medicine)
- Biology
- Chemistry
- Classics
- Comparative Religion
- Earth Sciences
- Economics
- Education
- Engineering
- English

- French
- German
- History
- Mathematics, Statistics and Computing Science
- Microbiology and Immunology (also in the Faculty of Medicine)
- Music
- Oceanography
- Philosophy
- Physics
- Political Science
- Psychology
- Russian
- Sociology and Social Anthropology
- Spanish
- Theatre

2.2 Faculty of Health Professions

- Nursing
- Occupational Therapy
- Pharmacy
- Physiotherapy
- Recreation, Physical, & Health Education
- Social Work

2.3 Faculty of Management

- Business Administration
- Public Administration

3. Class Selection

3.1 Numbering of Classes

Classes are numbered to indicate their general level. Those in the 1000 series are introductory classes at Dalhousie. Classes in the 2000, 3000, and 4000 series are usually first available to students in the second, third, and fourth years, respectively. Often these classes have prerequisites. Some departments/schools/colleges have minimum grade requirements for entry into classes above the 1000-level. Such requirements are listed in the calendar entries for the departments/schools/colleges concerned.

The letter following a class number indicates the session in which the class is offered. The letters A and B denote classes given in the first and second terms respectively. The symbol A or B indicates a class may be given in the first term or in the second term. Students should consult the academic timetable to verify whether a particular class will be offered in the A or B term in a given academic year. The letters C and R denote classes spread over both terms (i.e., given for the full academic year). An R class carries one full credit or more, and a C class less than one full credit. For the spring and the summer sessions, A denotes a class given in the first three and one half weeks, B

a class given in the second three and one half weeks, and R and C classes continuing for seven weeks.

Classes with numbers below 1000 normally do not carry credit.

3.2 Academic Advice

At Dalhousie all students are offered academic advice prior to registration. First-year students, particularly those in BA and BSc programmes, may wish to consult with the Office of the Registrar, or with a faculty advisor in an academic department/school/college of particular interest. After the first year, students plan their programmes in consultation with faculty advisors in their major departments/schools/colleges. Students complete and submit the Class Selection Form to the Registrar's Office.

Please note that the completion and submission of a class selection form does not constitute registration.

4. Workload

4.1 Regular Year

4.1.1 College of Arts and Science Workload

Five full credits per academic year shall be regarded as constituting a normal workload for a student. Written permission from the Student Appeals Committee of the appropriate Faculty or School is required if this workload is to be exceeded, or if the planned workload in any term would amount to the equivalent of six half-credits. In no case may the workload exceed this. Applications from students who give good reasons for wishing to take an overload. Such permission will not normally be granted to any student in the first year of study, or to any student who, in the preceding academic year, earned a sessional GPA of less than 3.0.

4.1.2 School of Business Workload

Six half credits per academic term in the first year, and five half credits per academic term in the following years will be regarded as constituting a normal workload for the BComm Co-op student.

During the work term, the work assignment shall constitute the normal workload.

There are no limitations on the number of credits taken during summer sessions at Dalhousie (subject to normal workload limitations) that may be counted toward the Bachelor of Commerce Co-op degree. Note that the second and third summers are regular academic and work terms for co-op students.

Students who wish to exceed the normal workload must apply for permission to the Director Academic Programmes, School of Business Administration. Such permission will not normally be granted to any student who is in his first year of study or who, in the preceding academic year, who earned a sessional GPA of less than 3.0.

4.1.3 Faculty of Health Professions Workload

For normal workloads in the Faculty, see the Individual School or College section of the Calendar. Written permission from the School or College Committee on Studies is required if the normal workload is to be exceeded. Applications from students who give good reasons for wishing to take an overload will be considered. Such permission will not normally be granted to any student in the first year of study, or to any student who, in the preceding academic year, obtained a grade point average of less than 3.0.

4.2 Spring and Summer Session

Students may normally take one full credit in each of the spring or summer sessions. Exceptions will normally be granted by the Student Appeals Committee of the appropriate Faculty or School with respect to attendance at a university which operates a trimester system or its equivalent. Students in Co-op programmes in Science may increase the workload to a maximum of 2.5 credits by summer school in any one year with a maximum of 1.5 credits in any one summer session. Spring and summer credits are included in the calculation of the cumulative GPA at the end of the next regular academic year. A sessional GPA is not calculated.

5. Registration

5.1 Registration material and detailed information will be sent to all eligible students. Students admitted late must register in person. After the Class Selection Form has been completed students may register, either in person or by mail.

5.2 A student is registered only after financial arrangements have been made at the Student Accounts Office.

5.3 The final step in registration is obtaining an ID or validating an existing ID from the Office of the Registrar.

An ID Card gives students access to many campus services and activities.

It is University Policy that every student writing an officially scheduled examination must present a current valid ID Card.

Students requesting the release of funds from the Awards Office must also present their ID Cards.

6. Class Changes and Withdrawal

6.1 Class Changes

It is recognized that some students may wish to make changes in programmes already arranged. Class changes will normally be completed during the first two weeks of classes. (For Spring and Summer session information, see the Summer School Schedule.) The last dates for adding and deleting "A", "B", "C", and "R" classes without academic penalty are published in the Schedule of Academic Dates at the front of the calendar.

Students may not transfer from full to part-time status by withdrawing from classes after the deadlines listed in the Schedule of Academic Dates. After these dates all classes for which a student remains registered will be recorded. A grade of W for withdrawal after the deadline will be treated as an F when the grade point average is calculated and in determining the pass list. To add or delete a class, students must complete a class change form which must be approved by the faculty member concerned and submitted to the Registrar. In Health Professions, class change forms must also be signed by the director, (NOTE: in the case of the School of Recreation, Physical, and Health Education, these are signed by the division heads, not by the Director,) and in the School of Business Administration, by the Director, Academic Programmes. No change is effective until a change form, available at the Office of the Registrar, is received by that Office.

6.2 Withdrawal

Non-attendance does not, in itself, constitute withdrawal.

Withdrawals are not effective until notification is received at the Office of the Registrar.

In Health Professions students who wish to withdraw from the University must obtain written approval from the School or College and submit the appropriate forms to the Registrar. Students should not discontinue attendance at any class until their application has been approved.

Students who withdraw from the University entirely may be entitled to refunds of fees.

7. Counting of Credits for Two Dalhousie Undergraduate Degrees

Students who hold one undergraduate degree from Dalhousie and who wish to gain a second undergraduate degree must fulfil the requirements of the second degree and meet the following stipulations:

- Only credits that are applicable to the programme for the second degree may be counted for credit.
- Each credit carried forward must have a grade of C or higher.
- Grade points must be earned in the new credits as required by Regulation 18 & 19 below.

7.1 College of Arts and Science

For the Honours degree, a minimum of eleven new full credits are to be taken, in accordance with "Degree Requirements" listed elsewhere in this calendar.

For the Advanced Major (20-credit) degree, a minimum of eleven new full credits, or the equivalent, must be taken. At least six of these are to be beyond the 1000-level in a new major subject, and at least three of the six must be beyond the 2000-level.

For the Major degree (15 credits), a minimum of six new full credits must be taken. At least four of these are to be beyond the 1000-level in a new major subject, and at least two of the four must be beyond the 2000-level. Normally, two of these credits will be in a subject other than the new major.

7.2 Management

For the BComm Co-op degree a minimum of 11 new full credits must be taken, of which at least eight must be in the core area and include the three work term half course credits.

7.3 Health Professions

For degrees in Health Professions no more than half the credits required for an undergraduate degree may be carried forward from an earlier degree.

8. Transfer Students

8.1 Transfer Credits - All Faculties

At Dalhousie transfer credits may be granted for classes which are offered by a recognized university or equivalent institution of higher learning and which are judged to be comparable to classes offered at Dalhousie and to be appropriate to a student's academic programme at Dalhousie. Transfer credit grants credit for a class and does not require substitution.

Transfer credits are subject to approval of departments/schools/college whenever the class in question falls within the scope of any Dalhousie department/school/college. For classes not within the purview of a Dalhousie department/school/college, the Assistant Dean or the applicable Academic Studies Committee will assess transfer credits. Students may appeal, in writing, a negative decision and should justify the inclusion of such classes in the student's proposed programme. Photocopies of calendar descriptions are necessary. Such descriptions are not normally included with university transcripts, and it is the student's responsibility to provide them.

To obtain a first degree or diploma, at least half of the credits, including at least half in the field of concentration, must normally be taken at Dalhousie.

In the Faculty of Health Professions to obtain a first degree, all or most of the advanced work of the programme (i.e. at least half the credits taken in the second and subsequent years of study) must be taken at Dalhousie.

8.2 Transfer Credits from Dental Hygiene

Students who have completed the Diploma in Dental Hygiene may receive credit towards a BA or BSc with a major in Biology for Biology 2100A or B and Biology 4403R. These classes are to be included within the 10 full credits which the Dental Hygiene students are eligible to receive as credit for a BSc or BA degree upon completion of the current diploma requirements. Thus for a BA or a BSc in Biology (15 credit programme), students who hold a diploma will be required to complete 5 additional credits at least 2.5 of which must be Biology classes.

8.3 No Transfer Credits

No credit will be given for any work used as the basis for admission.

No transfer credit will be granted for any class in which a final mark of less than C (or the equivalent in Dalhousie terms) was obtained.

Credits that are more than ten (10) years old may not be used to fulfill degree requirements unless a waiver is granted.

No classes taken at another institution will be counted towards fulfillment of the concentration requirement of the Bachelor's degree or the principal subject requirement of an Honours programme without specific advance approval from the department/school/college concerned at Dalhousie.

No credit will be given for any classes taken at another university while a student is inadmissible at Dalhousie.

8.4 Procedures

As soon as the student's record has been assessed the Office of the Registrar will inform the student which credits have been awarded. The number of credits which have been approved, and which Dalhousie classes may not be taken, will be included in the letter. If more credits have been approved than can be applied to the student's programme, the student will choose the credits to be used. If the student fails to do so, the Registrar's Office will decide the appropriate transfer credits. Transfer credits awarded on admission appear on a Dalhousie transcript as credits only; no marks are shown.

If by registration the student has not received written confirmation of transfer credits, the student should check with the Office of the Registrar. Information, although incomplete, may be available and may be helpful in choosing Dalhousie classes.

Before selecting classes the student should consult with the appropriate department(s)/school(s)/college(s) to determine how the transfer credits will fit into the student's specific academic programme at Dalhousie.

9. Advanced Placement

Students possessing advanced knowledge of a subject will be encouraged to begin their studies in that subject at a level appropriate to their knowledge, as determined by the department/school/college concerned. However, such students must substitute for the exempted classes an equal number of other classes, not necessarily in the same subjects (i.e. they must complete at Dalhousie the full number of credits required for the particular credential being sought).

10. Part-Time Students

Part-time students are reminded of University policy that limits programmes of study to 10 years from the date of initial registration. Note also, the regulation below concerning the number of credits that must be completed on campus at Dalhousie.

10.1 College of Arts and Science

Part-time students are admitted to most of the programmes offered in the College of Arts and Science. Admission requirements and regulations are the same for all students. Part-time students are encouraged to consult

with Henson College for advice on their academic programmes and other matters (see Continuing Education).

10.2 School of Business

The School is committed to providing students with the opportunity to obtain a degree through full-time study. However, the School will consider applicants for part-time study.

10.3 Faculty of Health Professions

Because of the restriction in the duration of undergraduate studies (see Regulation 17), the opportunity for part-time study is limited in the majority of programmes.

The exceptions are the undergraduate programmes in the School of Recreation, Physical and Health Education, the Maritime School of Social Work, the Bachelor of Science (Nursing) programmes for Registered Nurses and the Bachelor of Science (Physiotherapy) for students who hold a diploma in Physiotherapy.

11. Audit of Classes

Students who have been admitted to a Faculty may audit many of the classes offered with the permission of the instructor. Students auditing classes will not be eligible to write examinations in the audited class and will not in any circumstance be granted credit for it. For those who are not full-time students, fees are payable as indicated under Fees. A class may not be changed from credit to audit or from audit to credit status after the last date for dropping classes without penalty (see the schedule of academic dates). In order to change from audit to credit prior to the deadline an additional fee is required. It is essential that procedures as given in section 8 be followed.

12. Experimental Classes - College of Arts and Science

Experimental classes, on any subject or combination of subjects to which arts or sciences are relevant, and differing in conception from any of the classes regularly listed in departmental offerings, may be formed on the initiative of students or faculty members.

If formed on the initiative of students, the students concerned shall seek out faculty members to take part in the classes.

Whether formed on the initiative of students or on the initiative of faculty members, the faculty members who wish to take part must obtain the consent of their department/school/college.

The class may be of one-year length or half-year length.

A class shall be held to be formed when at least one faculty member and at least eight students have committed themselves to taking part in it for its full length.

Classes may be formed any time before the end of the second week of classes in the fall term to run the year or first half-year, or any time before the end of the second week of classes in the spring term. If they are formed long enough in advance to be announced in the Calendar, they shall be so announced, in a section describing the Experimental Programme, if they are formed later, they shall be announced (a) in the *Dalhousie Gazette*, (b) in the *Dal News*, (c) on a central bulletin board set aside for this purpose.

One faculty member taking part in each experimental class shall be designated the rapporteur of the class with responsibility for (a) advising the Curriculum Committee of the applicable Faculty or School of the formation and content of the class; (b) obtaining from the appropriate Curriculum Committee a ruling as to what requirement or requirements of distribution, concentration, and credit the class may be accepted as satisfying; (c) reporting to the Registrar on the performance of students in the class; (d) reporting to the appropriate Curriculum Committee, after the class has finished its work, on the subjects treated, the techniques of instruction, and the success of the class as an experiment in pedagogy (judged so far as possible on the basis of objective comparisons with more familiar types of classes).

Students may have five one-year length experimental classes (or some equivalent combination of these with half-year length classes) counted as satisfying class for class any of the requirements for the degree, subject to the rulings of the relevant Curriculum Committee (above) and (where relevant) to the approval of the departments.

13. Coordinated Programmes - College of Arts and Science

Students may in their second and third years follow a two-year integrated programme, or two one-year integrated programmes, of study. If two one-year programmes are chosen, they may be in different departments. All such coordinated programmes have been explicitly approved by the Curriculum Committee of the relevant Faculty or School. A department or group of departments offering coordinated

programmes may structure them as it wishes, consistent with sound academic practice and subject to the following guidelines:

- (a) that the equivalent of five credits constitutes a normal year,
- (b) that the function of each programme form part of the Calendar description of each programme,
- (c) that each two-year programme permits students at least one credit of their own choice in each of the second and third years,
- (d) that two-year programmes normally not be exclusively in a single discipline,
- (e) that the normal prerequisite for entry into a departmental one-year or two-year programme be the introductory class of the department/school/college in question, or an equivalent that the department/school/college considers acceptable, and not more than one introductory class in a related subject.

A student considering a Coordinated Programme should consult as early as possible with the departments concerned.

14. Off-Campus, Summer School, Correspondence Classes Taken at Other Universities

14.1 Off-Campus and Correspondence Classes

A maximum of three credits may be taken by off-campus classes, whether offered by Dalhousie or taken from another university under concurrent registration. In the Faculty of Health Professions, up to six credits (36 credit hours) from summer school and correspondence classes may be accepted towards the requirements of a degree. In Health Professions no student may receive more than two full credits (12 credit hours) by correspondence courses. In total, no more than six full credits in summer school and correspondence may count towards a degree.

14.2 Spring and Summer Session

Dalhousie currently offers a Spring and a Summer session of approximately seven weeks each, in May-June and in July-August. See Regulation 4 for permitted work-load. Those interested in the Spring and Summer sessions may request a summer school schedule from the Office of Continuing Education, Henson College, Dalhousie University.

14.3 Classes Taken at Other Universities on Letter of Permission

A student who wishes to take classes at other institutions while registered at Dalhousie must obtain approval in advance on a form available in the Office of the Registrar. A letter of permission will be provided if approval for the classes is given by the appropriate department/school/college. The workload at the other institution must conform to Dalhousie's limitations. (For details, see Regulation 4.)

The departments of French, German, Russian, and Spanish have special arrangements whereby up to a total of 5 full credits taken at other universities may be considered as part of a student's programme at Dalhousie. (See Regulation 15.)

The class fee will be paid by Dalhousie if:

- (a) the student is registered and has paid fees as a full-time student at Dalhousie,
- (b) the classes are approved as part of the student's programme, and
- (c) the class is not part of a spring/summer school programme.

15. International/Exchange Programmes

The College of Arts and Science and the Faculty of Management and the School of Recreation, Physical and Health Education offer a number of programmes which enable students to pursue part of their studies in another country and culture, often in a foreign language environment. These include:

- (a) Up to one full year of study in a foreign language environment. In recent years students have studied at the Université de Provence (Aix-Marseille) in France (consult the Department of French).
- (b) Up to one full year of study at a francophone university in Québec (consult the Department of French).
- (c) One term of study at Colegio de España, Salamanca, Spain (Consult the Co-ordinator in the Spanish Department).
- (d) One term of study at the Moscow Pedagogical Institute or St. Petersburg University (Consult the Administrator of the Russian Studies Programme in the Department of Russian).
- (e) A reciprocal exchange programme with the Chelsea School of Human Movement (U.K.), the Frostburg State College (Maryland, U.S.) and the State University of New York permits students of the School of Recreation, Physical and Health Education to

study abroad. Contact the School of Recreation, Physical and Health Education.

- (f) Up to one full academic year at one of eighteen (18) universities in the New England States. Consult the Admissions Officer in the Registrar's Office responsible for the New England Exchange.
- (g) Up to one full academic year at Instituto Tecnológico Autónomo de México (ITAM). Consult the School of Business Administration or the Registrar's Office.

Students interested in the programmes listed (a) to (e) above should refer to the appropriate departmental listing in this calendar for more details. For details regarding classes taken at other universities see Regulation 19.3. The number of Dalhousie equivalent credits completed may vary for each programme.

16. Preparation for Other Programmes

Work in the College of Arts and Science is prerequisite for various programmes in other Faculties and other institutions. A brief summary of the academic work required for admission to certain programmes is given here. Further information may be found later in this calendar, or in the separate faculty calendars.

Graduate Studies: Able and ambitious students are encouraged to consider seriously entering a graduate programme at Dalhousie or elsewhere. The normal requirement for admission to a graduate programme is an Honours degree or the equivalent.

Architecture: Two years of work, including at least one credit in mathematics, are required for entry to a programme in Architecture at the Technical University of Nova Scotia. For details, apply to the Faculty of Architecture at TUNS.

Dental Hygiene: Completion of 5 full credit university level classes of one academic year's duration in the following: Biology, Psychology, Sociology, a writing class, and one elective. For details, see the Dentistry, Law and Medicine calendar.

Dentistry: See the Dentistry, Law and Medicine calendar.

Design: Students completing one year in the College of Arts and Science at Dalhousie may be admitted into the second year of the four year programme leading to the Bachelor of Design degree in Communication Design or Environmental Design at the Nova Scotia College of Art and Design.

Education: The normal requirement for admission to the Bachelor of Education programme at Dalhousie is a BA or BSc degree with Honours. For details, please see the Education entry in this calendar.

Engineering: The Diploma in Engineering qualifies a student for entry to the Technical University of Nova Scotia to study Engineering.

Law: At least two years of work leading to one of the degrees of BA, BSc, BCom. For details, please see the Dentistry, Law and Medicine calendar.

Medicine: A BA, BSc, or BComm degree. For details, see the Dentistry, Law and Medicine calendar.

Occupational Therapy, Physiotherapy, Pharmacy, Recreation, and Social Work: One year of work in the College of Arts and Science, or the equivalent elsewhere, is required for admission to these five programmes. For details, see the Admissions Information section of this calendar.

Veterinary Medicine: Normally three years of work at Dalhousie are required for admission to the Atlantic Veterinary College of the University of Prince Edward Island. Dalhousie credits should normally include Computing Science 1400A; Mathematics 1000A/B/C and 1060A/B; one of Chemistry 1100R, 1110R, or 1200R; Chemistry 2400R; Biochemistry 2200B; one of Physics 1000R, 1100R or 1300R; English 1000R; Biology 1000R, 2030A/B, 2100A/B and 3323R; and an additional two and a half credits from the humanities and social sciences.

17. Duration of Undergraduate Studies

17.1 College of Arts and Science/Faculty of Management

Students are normally required to complete their undergraduate studies within ten years of their first registration, and to comply with the regulations in force at the time of that registration. This is also the normal limit for transfer credits. However, the student appeals committee of the appropriate Faculty or the School may grant permission to continue studies for a reasonable further period, subject to such conditions as the committee deems appropriate and with the stipulation that the student must meet the degree requirements in force when the extension is granted.

17.2 Faculty of Health Professions

With the exception of the undergraduate programmes in the School of Recreation,

Physical and Health Education and the Maritime School of Social Work to which Regulation 17.1 applies, students in the Faculty of Health Professions are normally required to complete their undergraduate studies within six years of first registration in professional classes or within five years in the post-diploma degree programme in Physiotherapy. This rule applies to such classes for transfer credits as well. The School or College Committee on Studies may grant permission to continue studies beyond this period subject to conditions specified by the Committee.

18. Assessment

18.1 Method

Examinations may be oral, written (closed or open book) under supervision, or take-home. To gain credit toward a degree or diploma, students must appear at all examinations, prepare such essays, exercises, reports, etc., as may be prescribed, attend the classes of their prescribed course to the satisfaction of the instructors and, in classes involving field or laboratory work, complete such work satisfactorily.

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 the class.

Within four weeks after the beginning of each term the department/school/college head or programme co-ordinator must report to the Dean the method of evaluation to be used by each instructor in each class.

18.2 Examinations and Tests

Tests are normally scheduled during class time. Mid-term tests scheduled outside class time are restricted to one per term between mid-October - mid-November or mid-February - mid-March.

Periods of approximately three weeks in the spring and one and one-half weeks in December are set aside for the scheduling of formal written examinations by the Registrar. Instructors wishing to have examinations scheduled by the Registrar for their classes must so inform the Registrar at the beginning of the third week of classes in the fall and winter terms. Instructors may also arrange their own examinations at times and places of their choosing during the formal examination periods, with the understanding that in cases of conflict of examinations for an individual student, the Registrar's examination schedule takes priority.

No tests or examinations worth more than 50% of the final grade in an "A", or "B"

or a "C" class, or more than 25% of the final grade in and "R" class may be held in the last two weeks of either term, without the explicit approval of the appropriate governing body of the Faculty or School. No tests may be held between the end of classes and the beginning of the official examination period with the exception of those activity modules and laboratory classes in Health Professions in which special facilities are required. Students may contact the Dean's/Director's Office of the appropriate Faculty/School/College for assistance if they are scheduled for more than two examinations on the same day.

18.3 Grades

A letter-grade system is used to evaluate performance. There is no formula for converting numeric grades to letter grades. Grades in the A range represent excellent performance, grades in the B range represent very good performance, and those in the C range represent satisfactory performance. A grade of D represents marginally acceptable performance except in programmes where a minimum grade of C is specified. See the calendar entries for specific programmes where a minimum grade of C is specified. The passing grades are A+, A, A-, B+, B, B-, C+, C, C-, D and P. (C+, C, C-, D not available for graduate classes). Other grades, including W, INC, F and F, are non-passing grades (see regulation 19). ILL, assigned for compassionate reasons or illness, is neutral.

18.4 Submission of Grades

On completion of a class, the instructor is required to submit grades to the Registrar. Such grades are to be based on the instructor's evaluation of the academic performance of the students in the class in question. Christmas grades must be submitted to the Registrar in all 1000-level classes in which enrolment on October 1 exceeded 25; Christmas grades are normally submitted in other full year classes.

18.5 Incomplete

Students are expected to complete class work by the prescribed deadlines. Only in special circumstances may an instructor extend such deadlines. Incomplete work in a class must be completed by Feb 1 for first term classes and June 1 for second term classes.

Exceptions to this rule will normally be extended only to classes which require field work during the summer months. At present the list of these classes in Arts and Science consists of Biology 4800A/B/C and 4900R; Music 3470C and 4470C; and Education 8490R. Students taking any of these classes

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in their final year should note that they will not be able to graduate at the spring convocation.

18.5.1 Faculty of Health Professions

The following classes are exceptions to the above which require field work during the summer months. At the present these are Health Education 1495/1595; Leisure Studies 4496; Physical Education 3398 and 3402; Nursing 2220, 3240 and 3250; Pharmacy 3000B, Occupational Therapy 2221B, 3319, 3321B and 4420A/B; Social Work 3020R/B, 4020R/B, and 4030R/B; and Physiotherapy 3500B. Students taking any of these classes in their final year should note that they will not be able to graduate at the Spring Convocation.

18.6 Marginal Failure

Only the supplemental grade will be included in the grade point average. The highest grade a student may receive on a supplemental exam is a grade of "C" which carries a grade point of 2.0. Supplemental exams will be administered by participating school/college. Students should check directly with their school/college for detailed information on the awarding of FM grades and eligibility for supplemental examinations.

18.7 Correction of Errors in Recorded Grades

Correction of errors in the recording of a grade may be made at any time. Otherwise changes will only be made as in Regulation 18.7 below.

Students are not entitled to appeal for any grade change more than six months after the grades are sent from the Office of the Registrar.

18.8 Reassessment of a Grade

On payment of a fee, a student may appeal to the Registrar for reassessment of a grade in a class. The Registrar will direct the request to the head of the academic unit concerned, who will ensure that the reassessment is carried out and reported to the Registrar. Written applications for reassessment must be made to the Registrar within two months of the date the grade is sent from the Office of the Registrar. Students have a right to view their marked examination papers by appointment for a period of two months from the date the grades are sent to students from the Office of the Registrar.

Note: Regulations 18.7 and 18.8 are under review by Senate.

18.9 Special Arrangements for Examinations, Tests and Assignments

At the discretion of the instructor, alternate arrangements for examinations, tests or the completion of assignments may be made for students who are ill, or in other exceptional circumstances.

Where illness is involved, a certificate from the student's physician will be required. This certificate should indicate the dates and duration of the illness, when possible should describe the impact it had on the student's ability to fulfill academic requirements, and should include any other information the physician considers relevant and appropriate. To obtain a medical certificate, students who miss examinations, tests or the completion of other assignments should contact the University Health Services or their physician at the time they are ill and should submit a medical certificate to their instructor as soon thereafter as possible. Such certificates will not normally be accepted after a lapse of more than one week from the examination or assignment completion date.

For exceptional circumstances other than illness, appropriate documentation, depending on the situation, will be required.

Requests for alternate arrangements should be made to the instructor in all cases. The deadline for changing a grade of ILL is February 1 for "A" classes and June 1 for "R", "C" and "B" classes for the Regular session. For the Spring and Summer sessions the deadlines are August 1 and October 1 respectively. Requests to change grades after these deadlines must be submitted in writing to the appeals committee of the appropriate school or faculty.

19. Academic Standing

Students' academic standing is normally assessed at the end of the Regular session.

BComm Co-op students will be assessed after two consecutive academic terms or after a single academic term which is followed by a work term.*

*Pending approval by the Senate Committee on Academic Administration.

19.1 Grade Point Average (GPA)

The Grade Point Average is the weighted sum of the grade points earned, divided by the number of credits in which grade points were earned, in accordance with the grade scale in 19.1.1. Classes with fewer than six credit hours earn proportional grade points (e.g. in a half-credit class, a C would yield one point).

19.1.1 Scale

Grade	Grade Points
A+	4.3
A	4.0
A-	3.7
B+	3.3
B	3.0
B-	2.7
C+	2.3
C	2.0
C-	1.7
D	1.0
F	0.0
FM**	0.0
INC(Incomplete)*	0.0
W(Withdraw after deadline)	0.0
ILL(Compassionate reasons/illness)	Neutral
P (Pass for credit classes)	Neutral
T(Transfer credit on admission).....	Neutral

* see 18.5

** see 18.6

19.2 Grade Points on Admission

Transfer credits on admission count as credits without grade points, i.e. they are neutral in the calculation of the GPA.

19.3 Grade Points on Letter of Permission

The grade earned in a class taken at another institution on a letter of permission is recorded and the appropriate Dalhousie grade points are assigned. For institutions which do not use letter grades, the Registrar's Office translates the grade into a Dalhousie grade and assigns the corresponding grade points.

19.4 Repeating Classes for which a Passing Grade has been Awarded

With the permission of the department/school/college concerned, a student may repeat any class for which a passing grade has previously been awarded. The original passing grade will nevertheless remain on the transcript and a second entry will be recorded with the new grade and the notation "repeated class." No additional credit will be given for such a repeated class, but both grades will be included in the calculation of the sessional and cumulative GPA.

19.5 Grade Points in the Spring/Summer Session

Students enrolled in classes during the Spring/Summer session will earn grade points which will be included in their cumulative GPA. A sessional GPA will not be calculated.

20. Probation

20.1 College of Arts and Science

20.1.1 Students with a cumulative GPA of less than 1.7 and greater than or equal to 1.0 who have completed at least four full credits will be placed on academic probation.

20.1.2 Students on probation are allowed to continue to register on probation provided that their sessional GPA is at least 1.7. Students on probation who do not achieve a sessional GPA of 1.7 will be academically dismissed for a 12-month period.

20.1.3 Students who are returning from a 12-month period of academic dismissal are allowed to register on probation. They are allowed to continue to register on probation provided that their sessional GPA is at least 1.7. Students who do not achieve a sessional GPA of at least 1.7 will be dismissed academically for the second time for a 36-month period.

20.1.4 Students require a cumulative GPA of 1.7 to graduate. Therefore, no one will be allowed to graduate while on probation.

20.2 Faculty of Health Professions and Faculty of Management

20.2.1 Students with a cumulative GPA of less than 2.0 and greater than or equal to 1.7 who have completed at least four full credits will be placed on academic probation.

20.2.2 Students on probation are allowed to continue to register on probation provided that their sessional GPA is at least 2.0. Students on probation who do not achieve a sessional GPA of 2.0 will be academically dismissed.

20.2.3 Students require a cumulative GPA of 2.0 to graduate. Therefore, no one will be allowed to graduate while on probation.

21. Academic Dismissal

21.1 Academic Dismissal - College of Arts and Science

21.1.1 Students with a cumulative GPA of less than 1.0 who have completed at least four full credits will be academically dismissed for a 12-month period.

21.1.2 Students on probation who do not achieve a sessional GPA of 1.7 or greater will be academically dismissed for a 12-month period.

21.1.3 Students who have been academically dismissed for the first time may re-register on probation after a 12-month period.

21.1.4 Students who have been academically dismissed for the second time will not be allowed to apply for re-admission for at least three calendar years.

21.2 Academic Dismissal - Faculty of Health Professions and Faculty of Management

21.2.1 Students with a cumulative GPA of less than 1.7 who have completed at least four full credits will be academically dismissed for a 12-month period.

21.2.2 Students on probation who do not achieve a sessional GPA of 2.0 or greater will be academically dismissed for a 12-month period.

21.2.3 Students who have been academically dismissed will not be allowed to apply for re-admission for at least twelve months.

21.2.4 Students who have been academically dismissed twice will not be allowed to apply for re-admission.

22. Graduation Standing

22.1 Minimum Cumulative GPA

22.1.1 A minimum cumulative GPA of 1.7 is required for the awarding of a degree in the College of Arts and Science.

22.1.2 A minimum cumulative GPA of 2.0 is required for the awarding of an undergraduate degree in the Faculty of Health Professions or the Faculty of Management.

22.2 Graduation with Distinction

A cumulative GPA of at least 3.7 is required to graduate with distinction. For the purpose of determining whether a student will graduate with Distinction, all classes taken while at Dalhousie, including repeated classes, and classes for which non-passing grades were obtained, are included. At least half of the classes must be completed at Dalhousie.

22.3 BA or BSc with Honours and First Class Honours

Students in the Faculty of Arts and Social Sciences who have obtained a grade of B- or better in five advanced classes, that is,

classes other than electives, will normally be admitted to the fourth year Honours, Concentrated, Combined or Unconcentrated Honours programme.

Students in the Faculty of Science who have obtained a grade of B or better in five advanced classes, that is, classes other than electives, will normally be admitted to the fourth year Honours, Concentrated, Combined or Unconcentrated Honours programme. In Special Honours programs, such as Biochemistry and Microbiology, see departmental entry.

To count towards an Honours degree each advanced class, (i.e., each class of the second, third, and fourth years, except electives) must be passed with a grade of at least C. Should a D or a C- be received, it must be made good by repeating the class and achieving a C or better grade or by taking an additional advanced class (preferably in the same subject). Otherwise the student must transfer out of the Honours programme. To continue in an Honours programme and to graduate, students registered in the Faculty of Arts and Social Sciences must achieve a cumulative GPA of 2.7 or better in their advanced classes; those students registered in the Faculty of Arts and Social Sciences for an Honours Programme in a Science subject (Biochemistry, Biology, Chemistry, Computing Science, Economics, Geology, Marine Biology, Mathematics, Microbiology, Neuroscience, Physics, Psychology, Statistics) must achieve a cumulative GPA of 3.0 or better in their advanced classes. Students registered in a Combined Honours Programme in the Faculty of Arts and Social Sciences must achieve a cumulative GPA of 3.0 or better in Science subjects (Biochemistry, Biology, Chemistry, Computing Science, Earth Sciences, Economics, Marine Biology, Mathematics, Microbiology, Neuroscience, Physics, Psychology, Statistics) should one of their "allied subjects" be in such a science subject. Students registered in the Faculty of Science must achieve a cumulative GPA of 3.0 or better in their advanced classes. For first class Honours, students in both Faculties must achieve a cumulative GPA of 3.7 or better in their advanced classes.

The Honours Qualifying Examination as prescribed by the departments/ schools/ colleges concerned must be passed. Unless Pass-Fail grading is employed, the grade must be B- or better and for first class Honours, A- or better.

23. Graduation

In order to graduate students must submit a Request to Graduate to the Office of the Registrar by the deadlines indicated below:

Graduation Month	Deadline
February.....	October 1
May.....	December 1
October.....	July 1

In cases where requests can be accommodated after the deadline, a \$50 fee will be charged.

24. Change from BA to BSc Programme and Vice Versa

All students who have completed all the requirements for a BSc degree have automatically completed all the requirements for a BA degree, provided they have included a language credit. Similarly most students who have completed all requirements for a BA degree in a science subject will have automatically completed all requirements for a BSc degree, provided they have completed the mathematics requirement. However, students who are registered for a BSc degree and wish to be awarded a BA degree or vice versa must do so by changing their registration at the Office of the Registrar.

25. Deans' and Directors' Lists

Students who have completed first, second, third or fourth year (where year is defined as the number of classes or credit hours deemed by the Faculty/School/College to be the normal yearly workload in the student's degree programme) and have achieved a sessional GPA of:

- 3.7 in the Faculty of Science; or
- 3.3 in the Faculty of Arts and Social Sciences; or
- 3.7 in the School of Education; or
- 3.7 in the Faculty of Management; or
- 3.7 in the Faculty of Health Professions

in the last five credits or equivalent credit hours will be placed on the Dean's or Director's List of the Faculty or School. The notation "Dean's List" or "Director's List" will appear on the student's transcript. Normally, fewer than fifteen percent of students are on the Deane' and Director's Lists.

26. Appeals

26.1 College of Arts and Science/Faculty of Management

Any students who believe they will suffer undue hardship from the application of any of the academic regulations may appeal for relief to the academic appeals committee of the applicable Faculty or School. Students wishing to appeal a decision based on College regulations may obtain copies of the document "How to appeal a College of Arts and Science regulation". Such appeals must be addressed in writing to the Chair of the appropriate appeals committee, c/o Office of the Registrar and must clearly state the arguments and expectations of the petitioners. An appeal from a student registered prior to 1991, arising from a required withdrawal from the faculty for academic reasons should be addressed to the Admissions Committee of the appropriate Faculty or School.

Students who wish to appeal on matters other than those dealt with by College or Faculty regulations can obtain copies of the document "A Procedure for special Academic appeals in the College of Arts and Science".

Both documents can be obtained from the Office of the Registrar or any departmental office.

26.2 Faculty of Health Professions

Students may appeal decisions pertaining to the College's or a School's interpretation of academic rules and regulations to the Faculty of Health Professions Undergraduate Committee on Studies. Normally, appeals to this committee occur after appeal procedures at the School or College level have been exhausted.

In the case of appeals initiated by students the following procedures shall normally be followed:

1. The student prepares and presents a written statement to the Dean requesting an appeal hearing and stating clearly which regulation is in question and the remedy being sought. The statement is to contain an outline of the circumstances that necessitate the appeal to the Faculty level and the expectations of the appellant. The student will also provide a telephone number and address through which the student can be reached.
2. The request for an appeal must be presented by the student to the Dean of the Faculty of Health Professions within thirty calendar days of notification of the student by the School/College of the disputed academic decision. The Dean will then ensure that the request for an

- appeal is forwarded to the Chairperson of the Committee on Studies within two business days.
3. Before acting upon the request for an appeal, the Chairperson of the Faculty Undergraduate Committee on Studies shall determine if School/College appeal procedures have been exhausted and that all the evidence presented to him/her has in fact been considered by the School/College Committee on Studies. If the Chairperson of the Undergraduate Committee on Studies is from the appellant's School/College, the Vice-Chairperson will preside over the appeal process.
 4. When the Chairperson or Vice-Chairperson has determined that the Faculty Committee should hear the case, he/she will place the matter on the agenda of the next regularly scheduled meeting, unless in the judgement of the Chairperson there is reason to hold the hearing at an earlier date. The case must be heard within thirty calendar days of receipt by the Dean of a written request for appeal.
 5. The Chairperson shall notify the student by telephone and by registered mail of the date, time, place of the appeal hearing, and of the student's right to appear before the Committee, either alone or with an advocate of his/her choice.
 6. Documentation in support of the appeal must normally be distributed to the Committee with the agenda seven days prior to the meeting. The chairperson is to ensure that an identical package of all materials is made available to the appellant, the appellant's advocate and the School/College.
 7. The members of the Committee whose decision is under appeal have the right to be present and to make representations before the Faculty Committee with, or without, an advocate of their choice and/or other School/College personnel.
 8. After the student's appeal has been heard, the Committee will continue the meeting in camera to reach a decision. Other persons from the School/College (as noted in 7 above) and the appellant and his/her advocate will be required to leave prior to the in camera deliberations.
 9. The decision of the Faculty Undergraduate Committee on Studies will be dispatched directly to the appellant by the Chairperson of the Faculty Undergraduate Committee on Studies in writing within 72 (seventy-two) hours of the hearing by registered mail. A copy of the decision will also be sent to the Director of the School/College in question and to the Dean of the Faculty.
 10. Should the Committee decide against the student's appeal, the Chairperson of the Faculty Undergraduate Committee on Studies will advise the student of the right to appeal to Senate.
 11. In the case of appeals initiated by the School/College on behalf of a student, the School/College will be responsible for providing all documentation. Correspondence or communications from the Chairperson of the Faculty Undergraduate Committee on Studies, as described in procedures 3, 5, 6, 10 and 11 above, shall be with the Director of the School/College.
- ## 27. Changes in Regulations
- In general, any change which affects a currently registered student adversely will not apply to that student. Any student suffering undue hardship from application of any of the regulations may appeal for relief to the appropriate academic appeals committee as in Section 26 and 26.1 above.

Degree Requirements

1. College of Arts and Sciences

1.1. Subject Groupings in the College of Arts Sciences

The various subjects in which instruction is offered are grouped as follows:

1.1.1. Languages and Humanities:

Classics, Comparative Literature, Comparative Religion, English, French, German, Greek, History, Latin, Music, Philosophy, Russian, Spanish, Theatre, and Women's Studies.

1.1.2. Social Sciences:

Canadian Studies, Economics, Education, History, International Development Studies, Political Science, Psychology, Sociology and Social Anthropology, and Women's Studies.

1.1.3. Life Sciences and Physical Sciences:

Biochemistry, Biology, Chemistry, Computing Science, Economics, Engineering, Geology, Mathematics, Microbiology, Neuroscience, Oceanography, Physics, Psychology, and Statistics

Please Note: In cases where a subject is listed in both of the groupings, any credit taken in that subject may be used to satisfy only one of the grouping requirements. A second credit in the same subject cannot be used to satisfy another subject grouping requirement.

1.2. Bachelor of Arts, Bachelor of Science - All Programmes

In the first year full-time students normally take five full-credit classes or equivalents. Students in the first year may not take for credit more than the equivalent of three full-credit classes in a single subject.

Students are required to include, in their first ten credits, one full-credit class or two half-credit classes from each of the subject groupings above. (Note: Students enrolled in Honours programmes in Biochemistry, Computing Science, Microbiology and combined Honours in Physics and Computing Science need not include these credits among their first ten credits, but must include them among the 20 earned to qualify for the degree.) Students in the first year may not take for credit more than the equivalent of three full-credit classes in a single subject from the subject groups above.

One of the five classes chosen must be selected from a list of classes in which written work is considered frequently and in detail. These writing classes are approved by the Writing Across Curriculum Committee and are listed below.

Chemistry 1000R; Classics 1000R, 1010R, 1100R; Comparative Religion 1301R; English 1000R; German 1000R, 1050R; History 1400R, 1990R; Philosophy 1010R; Political Science 1103R; Russian 2050R; Sociology and Social Anthropology 1001R, 1050R. (The King's Foundation Year Programme also satisfies this requirement.)

In order to qualify for a BSc degree candidates are required to complete successfully at least one full University credit in Mathematics other than Mathematics 1001A/1002B, Mathematics 1110A, and Mathematics 1120B. A class taken to satisfy this requirement cannot also satisfy the requirement of a class from section 1.1.3.

Students may satisfy this requirement by passing the test which is administered by the Department of Mathematics, Statistics & Computing Science. Such students must nevertheless complete 15 or 20 credits in order to graduate.

Students should seriously consider choosing a class from a list of classes which deal with a formal subject. Classes which are recognized as formal are:

Chemistry 1000R, 1010R, 1020R, 1030R; Computing Science (all classes); Economics 1106A/B, 2222A, 2223B, 2228R; Mathematics (all classes); Philosophy 2110R, 2130A, 2140B, 2190A/B, 2660R; Physics 1000R, 1100R, 1300R; Political Science 2494R, 3495A/B.

Students should consider becoming fluent in French. BA students are required to obtain one credit from the following language classes:

Classics 1700R, 1800R; French 1000R, 1001A/2001B, 1020R, 1040R; French 1060R; German 1000R, OR 1010R, 1050R, 1060R; Russian 1000R, 1050R; Spanish 1020R, 2000A, 2010B.

For students with advanced language skills, upper-level language classes may be substituted. Consult the Office of the Registrar if you require further information. A class taken to satisfy this requirement cannot also satisfy the requirement of a class from section 1.1.1.

Students may satisfy this requirement by passing one of the tests administered by the language departments. Such students must nevertheless complete 15 or 20 credits in order to graduate.

BA students who choose to major in Economics, International Development Studies, Philosophy, Political Science, Psychology or Sociology and Social Anthropology may substitute for a language class at least one full class in Mathematics or Statistics, other than Mathematics 1001A/1002B or Mathematics 1110A/1120B, to meet this requirement; or they may meet it by passing the test administered by the Department of Mathematics, Statistics & Computing Science. A class taken to satisfy this requirement cannot also satisfy the requirement of a class from section 1.1.3.

The King's Foundation Year Programme is deemed to meet the distribution requirements for Humanities - Languages and Social Sciences groupings, but students in the Programme must take a class in the Life - Physical Sciences to complete the subject grouping distribution requirements for Life Sciences and Physical Sciences.

Students who have not completed their first year but wish to enrol for further study, must first complete the first-year requirements.

1.2.1 Arts and Science Electives

Students may choose electives from any of the classes listed by departments offering major or honours programmes in the College of Arts and Science. In addition up to three credits may be obtained from the following:

- (a) Architecture 1000R;
- (b) Education Foundation Offerings (classes with numbers below 4400); classes numbered 4400 and above are not available as Arts and Science electives;
- (c) Classes in Engineering and Oceanography. The restriction on Engineering electives does not apply to students in the Diploma in Engineering Programme who combine their studies with a programme leading to a BA or BSc in the College of Arts and Sciences. (See the Engineering entry in this calendar).
- (d) Classes in Music. Note: Music classes 1000R, 1001A, 1002B, 2007R, 2008R, 2010R, 2011R, 2012R, 2013R, 2021R, 2087R, and 3064B are available as normal electives, but other classes in Music may be taken by special permission of the Department of Music.

- (e) The following approved classes from other Faculties and institutions: Commerce 1000, 1101A/B, 1102A/B, 2201A/B, 2301A/B, 2401A/B, 2801A/B, 3203A/B, 3302B, 3304A/B, 3306A/B, 3308B, 3501A/B, 4120A/B and Health Education 4412A/B.

Note: Students enrolling in elective classes must meet normal class prerequisites.

1.3. Bachelor of Arts and Bachelor of Science - Honours Programmes

1.3.1 Second, Third and Fourth Years: Able and ambitious students are urged to enter Honours Programmes. These programmes require a higher quality of work than is required by the other undergraduate programmes of the College (15-credit Major and 20-credit Advanced Major). There are three types of Honours programmes: concentrated, combined and unconcentrated.

For the BA, the Honours subject may be chosen from Classics, Economics, English, French, German, History, International Development Studies, Philosophy, Political Science, Russian, Social Anthropology, Sociology, Spanish, and Theatre or any of the BSc Honours subjects.

For the BSc, the Honours subject may be chosen from Biochemistry, Biology, Chemistry, Computing Science, Economics, Geology, Marine Biology, Mathematics, Microbiology, Neuroscience, Physics, Psychology and Statistics.

Applications for admission to Honours programmes must be made to the Departments concerned on forms available in Departments and at the Office of the Registrar. The Registrar may be consulted by those considering unconcentrated Honours.

Students should apply before registering for the second year. If application is made later, it may be necessary to make up some work not previously taken.

For each individual student the entire Honours programme, including elective credits, is subject to supervision and approval by the Department or Departments concerned, or in the case of unconcentrated Honours, by an interdisciplinary committee.

Note: The last day to apply to an Honours programme is September 27.

1.3.2. Honours in a concentrated programme is based on the general requirement that the 15 credits beyond the first year of study comprise:

- (a) A normal requirement of nine credits beyond the 1000-level in one subject (the major subject). Students may, with the approval of the Department

concerned, elect a maximum of eleven credits in this area. In this case (c) below will be reduced to two or three credits.

- (b) Two credits in a minor subject satisfactory to the major Department.
- (c) Four elective credits not in the major field.
- (d) An additional grade (see Honours Qualifying Examination below).

1.3.3. Honours in a combined programme is based on the general requirement that the 15 credits beyond the first year of study comprise:

- (a) A normal requirement of eleven credits beyond the 1000-level in two allied subjects, not more than seven credits being in either of them. Students may, with the approval of the Departments concerned, elect a maximum of thirteen credits in two allied subjects, not more than nine credits being in either of them. In this case the requirement in (b) below is reduced to two or three credits.
- (b) Four elective credits in subjects other than the two offered to satisfy the requirement of the preceding clause.
- (c) An additional grade (see Honours Qualifying Examination below).
- (d) Honours in a combined programme leading to the BSc may be obtained by choosing both subjects from the BSc Honours subjects listed above, or by combining one of the BSc Honours subjects with one of the BA Honours subjects, provided that the larger number of advanced credits is from a science subject.

Details of specific departmental honours programmes are given under departmental listings of Programmes of Study.

1.3.4. Unconcentrated Honours programmes are based on the general requirement that the 15 credits, beyond the first year of study comprise:

- (a) Twelve credits beyond the 1000-level in three or more subjects. No more than five of these may be in a single subject; no less than six nor more than nine may be in two subjects.
- (b) Three elective credits.
- (c) For an Unconcentrated BA (Honours), at least ten credits of the twenty selected must be selected from subject groups, sections 1.1.1, 1.1.2, and 1.1.3, at the beginning of this section.
- (d) For an Unconcentrated BSc (Honours), at least eight credits of the twenty required must be selected from Biochemistry, Biology, Chemistry, Computing Science,

Economics, Geology, Mathematics, Microbiology, Neuroscience, Physics, Psychology, and Statistics, and at least six additional credits must be selected from subject groups B and C listed at the beginning of this section.

- (e) An additional grade (see Honours Qualifying Examination below).

1.3.5. Honours Qualifying Examination. At the conclusion of an Honours programme a student's record must show a grade which is additional to the grades for the classes taken to obtain the required twenty credits. This grade may be obtained through a comprehensive examination, the presentation of a research paper (which may be an extension of one of the classes), or such other method as may be determined by the committee or Department supervising the student's programme. The method by which this additional grade is obtained is referred to as the Honours Qualifying Examination. Departments may elect to use a pass-fail grading system for this grading examination.

For the standing required for Honours, see section 22.3, p. 96.

1.4 Bachelor of Arts, Bachelor of Science - Advanced Major Programmes (20-credits)

Students who do not wish to attempt an Honours programme are encouraged to enter an Advanced Major programme, which also requires 20 credits but with a lesser degree of concentration in a single subject. Such students are advised to seek detailed information from the Department in which they wish to concentrate. The requirements for such programmes are consistent with requirements for Major degree programmes. The five additional credits required must all be obtained at an advanced level. Unlike the Honours degree, the Advanced Major degree may not provide appropriate training for consideration for admission to a one-year Master's programme.

In order to satisfy the requirements for the Advanced Major degree, at least 12 of the 20 credits must be beyond the 1000-level. A minimum of six and a maximum of nine credits beyond the 1000-level are to be in the Major, and three of them must be beyond the 2000-level.

It is also possible to enter an Advanced Double Major in the 20-credit programme, with the approval of the two major departments concerned. In this case a minimum of ten credits and a maximum of thirteen beyond the 1000-level are to be in the two allied subjects, with no more than nine and no fewer than four in either. At least two credits in each of the two major subjects must be beyond the 2000-level.

For the BA, the Advanced Major may be chosen from Classics, Comparative Religion, Economics, English, French, German, History, International Development Studies, Philosophy, Political Science, Psychology, Russian, Sociology and Social Anthropology, Spanish, or Women's Studies or from any of the BSc Major subjects.

For the BSc, the Advanced Major may be chosen from Biochemistry, Biology, Chemistry, Computing Science, Economics, Geology, Marine Biology, Mathematics, Microbiology, Physics, Psychology, or Statistics.

An Advanced Double Major leading to the BSc may be obtained by choosing both subjects from the BSc major subjects listed above or by combining one of the BSc major subjects listed above with one of the BA major subjects, provided that the larger number of advanced credits is from a science subject.

1.5 Bachelor of Arts, Bachelor of Science - Major Programmes (15 credits)

1.5.1. Second and Third Years

Before registering for the second year, each student must declare an area of concentration, and obtain programme advice from a faculty advisor in the appropriate department.

Ten full credits, or the equivalent in half-credit classes, make up the course for the second and third years. These must meet the following requirements:

- (a) at least seven credits shall be beyond the 1000-level.
- (b) at least one credit or two half-credits shall be in each of at least two subjects other than the area of concentration.
- (c) at least four and no more than eight credits beyond the 1000-level shall be in a single area of concentration (the major), and at least two of these must be beyond the 2000-level with the following exception: Students enrolled in the combined Engineering Diploma and 15-credit major programme in Mathematics or Chemistry need take only one full credit (or two half credits) beyond the 2000-level in the area of concentration.
- (d) up to four of the credits in the major subject must be selected in accordance with departmental or interdepartmental requirements.

For the BA, the area of concentration may be chosen from Classics, Comparative Religion, Economics, English, French,

German, Greek, History, International Development Studies, Latin, Music, Philosophy, Political Science, Russian, Sociology and Social Anthropology, Spanish, Theatre, Women's Studies or from any of the BSc major subjects.

For the BSc the area of concentration may be chosen from Biology, Chemistry, Computing Science, Economics, Earth Science, Mathematics, Physics, Psychology, or Statistics.

For the standing required for a BSc or BA see section 22, p. 96.

1.5.2. Individual Programmes

In cases where students feel that their academic needs are not satisfied under the above requirements, individual programmes may be submitted to the Student Affairs Committee of the Faculty of Arts and Social Sciences or to the Curriculum Committee of the Faculty of Science or the School of Education prior to or during the student's second academic year. The Dean shall act as advisor for such students.

1.6 Upgrading of a BA or BSc to an Honours or Advanced Major Degree

A person who holds a Dalhousie BA or BSc (15-credit) degree may apply through his/her department advisor or, for Multidisciplinary Programmes, their Coordinator, for admission to an Advanced Major or Honours programme. On completion of the required work with proper standing, a certificate will be awarded which has the effect of upgrading the degree to Advanced Major or Honours status, as appropriate.

1.7. Programmes in Co-operative Education (20 credits)

The aim of Co-op degree programmes is to enable students to combine their studies with work experience. The programmes are thus year-round, including Spring and Summer School, and will normally require from forty-eight to fifty-two months for completion.

Co-op degree programmes conform to the requirements for either the Advanced Major or Honours degrees.

The following Departments currently offer Co-op programmes: Biology, Chemistry, Earth Sciences, Mathematics, Statistics and Computing Science, and Physics. For details of these programmes, consult the Calendar entries for the Departments.

1.8. Joint Honours: Dalhousie-Mount Saint Vincent

Special arrangements exist under which students may be permitted to pursue an Honours programme jointly at Dalhousie and Mount Saint Vincent Universities. Interested applicants should consult the appropriate Department of their own university at the beginning of the second year. Prospective joint honours students must be accepted by the Honours Departments concerned at both institutions. These Departments supervise the entire programme of study of accepted applicants. Students should be aware that not all classes available for credit at Mount Saint Vincent can be given credit at Dalhousie and vice versa. In order for students to obtain a joint honours degree they must satisfy all requirements of both institutions.

1.9. Bachelor of Music and Bachelor of Music Education

For the special requirements of these degrees, see the entry for the Department of Music.

1.10. Diploma in Engineering

For details of the requirements for the diploma, see the entry for the Department of Engineering.

1.11. Bachelor of Education

Admission to this programme normally requires that the applicant holds a prior undergraduate degree, or is simultaneously enrolled for one. There is, however, an arrangement under which it is possible to obtain a BEd in association with the Nova Scotia Teachers' College as a first degree.

For details about BEd programmes, see the entry for the School of Education.

1.12. Certificate and Diploma in Costume Studies

Study for these credentials is entirely within the Department of Theatre. See the entry for that department for detailed information.

1.13. Diploma in Meteorology

Details of the requirements for this diploma may be found in the entry of the Department of Physics.

2. Faculty of Management

2.1 School of Business

The Bachelor of Commerce Co-op is a four-year programme comprising 7 academic terms and 3 work terms. The equivalent of

20 full credits (40 half credits) plus non-credit seminar is required for graduation. Note: all classes are half-credits except those designated as "R", which are full credits.

The work term requirements of the Bachelor of Commerce Co-op may involve placement problems for Visa students. Subject to approval by the School, students may be permitted to arrange their own work term positions. Notwithstanding, the best interests of most Visa students may be better served by seeking admission to a university that does not have a mandatory Co-op programme.

The classes in the programme are divided into five categories, as follows:

2.1.1 Required Core Area Classes

The equivalent of ten full credits (twenty half credits) Commerce 1000, 2101, 2102, 1501, 2201, 2301, 2401, 2501, 2502, 2601, 2701, 2302, 3501, 4350R; (Economics 1100R, 2200, or 2201; Mathematics 1000 and 1010, or 1110 and 1120*

Note: Mathematics 1110 and 1120 are specifically designed for the Commerce programme, but are not normally accepted as the prerequisites for upper level Mathematics or Computing Science classes.

2.1.2. Core Area Electives

The equivalent of four full credits (eight half credits) to be selected from offerings in the core areas of Commerce, Economics and Mathematics (including Computing Science).

2.1.3. Non-Commerce Electives

The equivalent of three full credits (six half credits) to be selected from all classes offered in the university except those designated as Commerce classes.

2.1.4. Free Electives

The equivalent of one and one-half full credits (three half credits) chosen, subject to the approval of the School of Business Administration, from all classes offered in the University.

2.1.5. Work Term Requirements

The equivalent of one and one-half full credits (three half credits) require the satisfactory completion of three work terms. A non-credit "seminar" is also required to be completed in the term prior to the first work term.

Students are expected to ensure that the classes taken comply with the above.

Academic regulations for the Bachelor of Commerce Co-op are generally based on or adapted from those applicable to the Bachelor of Commerce degree. The Bachelor of

104 Degree Requirements

Commerce Co-op, however, is a more structured programme, with most of its classes assigned to specific years and terms. The chart on page 100 summarizes the degree requirements and class sequencing through all seven of the academic terms and three work terms that constitute the Bachelor of Commerce Co-op Programme. It will be noted that Commerce 1000 and Commerce 1501 will be offered in the Spring to permit students an opportunity to make up academic deficiencies and proceed to Year II of the Bachelor of Commerce Co-op.

2.1.5. Competency in the English Language

All students in the Commerce programme must satisfy the School as to their competency in the English Language. This requirement is satisfied by successfully completing the Business Communication Course, Commerce 2701, which is a required course in second year. The School recommends, but does not require, that students take at least one course in first year,

from their electives, in which written work is considered frequently and in detail. These writing classes are approved by the Writing Across Curriculum Committee and are listed as follows: Chemistry 1000R, Classics 1000R, 1010R, 1100R, Comp. Rel. 1301, English 1000, German 1000R, 1050, History 1400, 1990, Philosophy 1010, Political Science 1103R, Russian 2050R, Sociology and Social 1001, 1050R.

2.2. School of Public Administration

Please refer to the Public Administration entry in this calendar

3. Faculty of Health Professions

For degree requirements for programmes in the Faculty of Health Professions, refer to the entry in this calendar for the appropriate school or college.

Dalhousie University Co-op Bcomm

Term Year	Fall Sept./Dec.	Winter Jan./April	Co-op Summer May/Aug.
I	Math 1000 or 1110 (1) Comm 1000 (1)	Math 1010 or 1120 (1) Comm 1501 (1)	Free Safety Net
	Econ 1100 (2) 3 Non-commerce Electives (6)		Comm 1000 (1) * Comm 1501 (1)
II	Comm 2101 (1) Comm 2301 (1) Comm 2401 (1) Comm 2501 (1) Comm 2601 (1) Seminar *	Work Term (1)	Comm 2101 (1) Comm 2201 (1) Comm 2502 (1) Comm 2701 (1) Comm 3302 (1)
III	Work Term (1)	Econ 2200 or 2201 (1) Comm 3501 (1) 3 Core Electives (3) *	Work Term (1)
IV	Comm 4350 (2)		
	3 Core Electives (3) 1 Free Elective (1)	2 Core Electives (2) 2 Free Electives (2) *	

* Student's academic standing will be assessed at the end of this academic term (see sections 20, 21, and 22, Academic Regulations).

African Studies

Location: Pearson Institute Halifax, N.S.
Telephone: (902) 494-214
Advisor: Jane Parpart 494-2011

Dalhousie University offers a set of classes in different disciplines which focus on Africa. Its Centre for African Studies, established in 1975, coordinates teaching, seminar, research, community and publications programmes in African Studies. Its faculty associates hold appointments in the social sciences, humanities and professional schools. Undergraduate classes on Africa are usually available in Economics, History, International Development Studies and Political Science. Other classes with a broader Third World focus, which usually includes African content, are offered in Comparative Religion, English, Education, Health Law, and Sociology and Social Anthropology.

Students interested in Africa are encouraged to select classes from these several disciplines which concentrate on the continent. These could be included in single or combined major or honours programmes in Economics, History, International Development Studies, Political Science and/or Sociology and Social Anthropology.

Architecture

ARCH 1000R Introduction to Architecture: An introductory class showing architecture as a bridge between the Arts and Science providing an insight into professional architectural studies. In the first term discussion centres around some components of architectural design; in the second term, architecture in present day life. Available as an elective in the general degree programmes in Arts and Social Sciences and Sciences. This class is held at TUNS.

Instructor: Staff
Format: Lecture/seminar 1 hour,
practical 2 hours
Enrolment: Limited

Biochemistry

Location: Sir Charles Tupper Medical
Building College Street
Telephone: (902) 494-2480
Fax: (902) 494-1355

Head of Department

W. Carl Breckenridge

Faculty Advisors

J.A. Verpoorte - Undergraduate Advisor
(494-2022)
A.H. Blair - Graduate Advisor (494-2407)

Professors

A.H. Blair, BA, MSc (UBC), PhD (Calif)
W.C. Breckenridge, BSc (Queen's), MSc,
PhD (Tor)
P.J. Dolphin, BSc, PhD (Southampton)
W.F. Doolittle, AB (Harv), PhD (Stan)
M.W. Gray, BSc, PhD (Alta)
C.W. Helleiner, BA, PhD (Tor)
C.B. Lazler, BA (Tor), MSc (UBC), PhD (Dal)
F.B.St.C. Palmer, BSc, PhD (Western)
D.W. Russell, BPharm, PhD, DSc (Lond), BEd
(Dal)
R.A. Singer, AB (Princeton), PhD (Harv)
M.W. Spence, MD (Alta), PhD (McG)
M.H. Tan, BSc, MD (Dal)
J.A. Verpoorte, BSc, Drs (Utrecht), DSc
(Pretoria)
C.J.A. Wallace, BA, MA, DPhil (Oxon)

Associate Professors

H.W. Cook, BSc, MSc (McG), PhD (Dal)
F.I. Maclean, BA, MA (Tor.), DPhil (Oxon)

Assistant Professors

D.M. Byers, BSc, MSc (Dal), PhD (Alta)
D.E.C. Coie, BSc, MD (Tor), PhD (McG)
P.X.-Q. Liu, BSc (Wuhan), PhD (Cornell)
N. Ridgway, BSc (Dal), PhD
H.-S. Ro, BSc, PhD (McM)

Lecturers

S.S. Reddy, BS, MD (Memorial)
D.C. Riddell, BSc, PhD (Kingston)

Introduction

Biochemistry is the study of biological function at the molecular level. Although biochemical processes follow the basic laws of physics and chemistry, living organisms, because of their complexity, operate on a set of distinct principles that are not found in simple isolated chemical systems. The goal of biochemistry is to elucidate these principles. The department offers an integrated series of classes that will provide students with an up-to-date view of modern

biochemistry ranging from structure-function relationships in macromolecules to the dynamic aspects of metabolism. A set of classes has been identified to meet the needs of honours Biochemistry or Microbiology students who hope to pursue further study in molecular and genetic approaches to fundamental problems. These classes provide solid grounding in bacterial and eukaryotic gene structure and function, regulation and evolution, and both practical and theoretical presentations of current and developing methodology (genetic engineering). The classes can be fully integrated with training in metabolism, enzymology, bacteriology, virology and immunology provided by the two departments, as they provide a good practical grounding in the recombinant DNA methods which have become essential in fields as diverse as genetic diagnosis and gene therapy, forensics, industrial microbiology, and molecular evolution.

Degree Programmes

Note: Students interested in a Biochemistry degree should obtain from the department a special booklet that describes all of the programmes available and the special requirements relating to them. Degree programmes should be planned in consultation with the undergraduate coordinator (Dr. J.A. Verpoorte), or another faculty advisor (Dr. F.B. Palmer, Dr. R.A. Singer).

There is no three-year programme with a Biochemistry major. Students wishing to include Biochemistry in other programmes are welcomed. Students cannot obtain credit for both Biochemistry 2200 and 2020 and the Biochemistry 2000 and 2800 offered previously. Note that all Biochemistry classes have prerequisites.

B.Sc. with Honours in Biochemistry

This is a special concentrated Honours Programme. Because Biochemistry and Chemistry are closely interwoven both conceptually and experimentally, the list of major classes required (see Degree Requirements) includes both subjects to a total of 10.5 credits. Additional chemistry classes may be taken as electives, or by choosing Chemistry as a minor subject. Students should consider Mathematics 1060 or 2060. For entrance to Biochemistry 2200, students require minimum grades of C in Biology 1000 and Chemistry 1010 (or equivalent). Honours students must meet the general degree requirements of the faculty.

- Year 1:** Chemistry 1010 or equivalent; Biology 1000; Physics 1100; Mathematics 1000 & 1010, a "Writing Class" (see Regulation 11).
- Year 2:** Biochemistry 2020, 2030 and 2200; Chemistry 2201, 2301, 2302, and 2400; and one full credit in the minor subject.
- Year 3:** Biochemistry 3200, 3300, & 3400; Chemistry 3403 and Chemistry 3402 or Microbiology 3033; one half-credit elective (any subject); one full credit elective (not Biochemistry nor minor); and one full credit in the minor subject.
- Year 4:** Biochemistry 4602 and 4603A; three more credits in Biochemistry, including at least one half-credit in each of the following areas: Metabolism (43xx), Molecular Biology (44xx), and Physical Biochemistry (47xx); one half-credit elective (not Biochemistry nor minor).

A minor subject (see Degree Requirements) should be chosen in consultation with the department's Advisor. Elective and minor classes need not be taken in the order stated.

Laboratory exercises. many of the classes offered by the department of Biochemistry include a laboratory component. The laboratory exercises provide an opportunity to develop laboratory skills, as well as to illustrate the theoretical principles taught in class. This process culminates in fourth year, when both an advanced laboratory class and a supervised research project are required for honours Biochemistry students. Although no exercise involves live animals, experiments may use materials derived from animal sources, as well as from plants and micro-organisms. Laboratory experiments will often be performed in groups, but the writing of reports is expected to be an individual effort, meeting the guidelines on plagiarism set out in the University Regulations in the Calendar.

BSc with Combined Honours in Biochemistry and Another Science

Biochemistry may be chosen along with one of Biology, Chemistry, Mathematics, Microbiology, Physics, Psychology, or possibly another subject, for a Combined Honours Programme. A Combined Honours degree in Biochemistry requires the following credits: Biochemistry 2020, 2030, 2200, 3200, 3300, 3400 and one full credit from 43XX, 44XX, and 47XX and also Chemistry 2400. Consult the Undergraduate Advisor, Dr. J.A. Verpoorte, for details of recommended courses of study.

BSc Advanced Major in Biochemistry

The department offers a four-year, 20-credit programme of study leading to an Advanced Major Degree. The programme, while not designed as a preparation for graduate study in Biochemistry, nevertheless introduces students to all main aspects of the subject. As well as meeting the general degree requirements of the faculty. Students must complete the following classes with a grade of C or better: Chemistry 1010 (or equivalent), and Biology 1000; and with grades of C- or better Chemistry 2201 and 2400; and Biochemistry 2020, 2030, 2200, 3200, 3300, 3400, and at least three full credits in Biochemistry at the fourth-year level. Students who have not passed Nova Scotia grade 12 Physics or its equivalent must include a 1000-level Physics class among their first ten credits.

Co-op Programme

The department has developed a cooperative programme. Consult the department for details

Classes Offered

The Department also teaches students in Dental Hygiene, Dentistry, Medicine, Nursing and Pharmacy; these classes are described in the appropriate sections of the Calendar. Classes marked * are not offered every year; please consult the current timetable.

BIOC 1420B Introductory Biochemistry:

Topics discussed are structure, biosynthesis, and function of carbohydrates, lipids, proteins and nucleic acids; enzyme kinetics; genetic engineering; nutrition. Medical aspects are stressed.

Instructor: F. I Maclean
Format: Lecture 3 hours, Lab 2 hours
Prerequisite: Chemistry 1410A or permission of Instructor
Cross-listing: Chemistry 1430
Exclusions: This class cannot be used as a prerequisite for any other biochemistry class.

Enrolment: 150

BIOC 2020 A or B Cell Biology: This class is described under Biol 2020 A or B.

BIOC 2030 A or B Genetics and Molecular Biology: This class is described under BIOL 2030A or B.

BIOC 2200B Introductory Biochemistry: This class will survey basic topics and concepts of Biochemistry. Topics include; the chemical and biological description of constituents of living organisms, like amino acids, pyrimidines and purines, carbohydrates, lipids, hormones and

vitamins. The interrelations between the various groups of compounds will be discussed. Introductions to macromolecular structures and functions will be presented.

Instructors: C.W. Helleiner, D.W. Russell, C.J.A. Wallace and W.C. Kimmins (Biology)

Format: lecture 3 hours, tutorial 1 hour alternating with Lab 4 hours

Prerequisites: Biology 1000, Chemistry 1100, grades of C. Students are advised to also take Chemistry 2400

Cross-listing: BIOL 2010B

Exclusions: No credit will be given together with credits for previous classes Bloc 2000 and 2800

Enrolment: 100

SCI 3000R Science Fundamentals: An interdisciplinary class that stresses the motivations, methodologies, and responsibilities of scientists, and provides extensive formal instruction in written and oral communication of scientific material. For details, see main calendar entry "Science, Interdisciplinary." The status of this class (elective, minor, or major credit) varies from department to department; check with your undergraduate advisor.

BIOC 3101A and 3102B Introductory Biochemistry for Pharmacy Students: These classes deal with general aspects of biochemistry and include the chemistry of natural products. Classes are restricted to Pharmacy students.

BIOC 3200, 3300, and 3400 are half-credit classes, each of which deals with one important aspect of biochemistry. The level of instruction is such that adequate preparation is essential. These classes are described below.

Prerequisites: Chemistry 2400, Biochemistry 2020, 2030, 2200, or instructor's consent

BIOC 3200A Biological Chemistry: This class deals with chemical principles governing biochemical systems. We discuss the factors that determine how readily a given metabolic reaction proceeds and describe how these factors may be expressed quantitatively. Basic principles of protein structure, carbohydrates and lipids are discussed. The ways in which proteins bind other molecules are described.

A discussion of enzyme catalysis emphasizes relationships between macromolecular structure and biochemical function, enabling us to explain the striking effectiveness and high specificity with which these catalytic proteins carry out their functions.

Instructors: A.H. Blair and J.A. Verpoorte

Format: lecture 3 hours; lab 3 hours

Prerequisites: see above

Cross-listing: BIOL 3012A

Enrolment: limited to 64 students

BIOC 3300B Intermediary Metabolism: Emphasis is chiefly on metabolic pathways common to all organisms, notably the reductive synthesis and oxidative catabolism of carbohydrates, lipids, and some nitrogen compounds. Other pathways, significant in certain tissues or organisms, are included. Metabolic regulation is surveyed, and factors influencing the rate at which compounds flow through selected pathways are examined. Students learn how pathways are compartmentalized, interrelated, and affected by abiotic chemical changes in the environment. Laboratory exercises demonstrate the strategies and techniques used to study metabolic pathways.

Instructors: F.B. Palmer and W.C. Kimmins (Biology)

Format: Lecture 3 hours, Lab 3 hours

Prerequisites: see above

Enrolment: limited to 64 students

Cross-listing: BIOL 3013B

BIOC 3400A Nucleic Acid Biochemistry and Molecular Biology: This class focuses on the relationship of structure to function in RNA and DNA. Methods for studying the primary, secondary, and tertiary structures of nucleic acids are explored in lectures and in the laboratory. Enzymic mechanisms for biosynthesis, rearrangement, degradation, and repair of nucleic acid molecules are studied, as are the processes of replication and transcription. In this context, nucleic acid biochemistry is emphasized as a basis for understanding storage and transfer of biological information.

Instructors: M.W. Gray (Biochemistry), J.M. Wright (Biology) and M.J. O'Halloran (Biology)

Format: Lecture 3 hours, Lab 3 hours

Prerequisites: see above

Enrolment: limited to 64 students.

Cross-listing: BIOL 3014B

4300 Series: Intermediary Metabolism and Control: These half-credit classes continue the study of metabolism begun in Biochemistry 3300, and introduce also some specialized topics of particular interest. Emphasis is on how metabolic systems are related and how the systems and their relations are controlled. Appraisal of experimental evidence and interpretation of data are stressed. Students are asked to note the prerequisites stated in each class description.

BIOC 4301B Biochemical Communication: Membranes, Neurotransmitters, and Hormones: This class examines current

ideas of biochemical communication mechanisms, especially in the nervous and endocrine systems. The topics include membrane biogenesis, structural and functional relationships between cytoskeleton and membranes, intra- and intercellular trafficking and signal transduction. Recent advances in our knowledge of hormonal regulation of gene expression are emphasized and the mechanisms of action of peptide and steroid hormones and neurotransmitters are discussed in depth.

Instructors: C. Lazier
Format: Lecture, 2 hours
Prerequisites: BIOC 3200, 3300, and 3400 or instructors' consent
Enrolment: limited to 64 students

BIOC 4302A Biochemistry of Lipids: The chemistry and physics of insoluble lipids in an aqueous environment are explored. Current evidence for the physical state of lipids in organisms is examined, and problems in the interaction of insoluble lipids with soluble and insoluble enzymes are considered. The metabolism of lipids that have specialized physiological functions, such as glycolipids, saposinoids, steroids, phospholipids, etc, are studied.

Instructors: F.B. Palmer and H.W. Cook
Format: Lecture 2 hours
Prerequisites: BIOC 3200 and 3300
Enrolment: 64

BIOC 4304B Integration and Control of Metabolism: Topics include: generation and regulation of membrane potentials, roles of membrane potentials in energy generation and in modulating pathways requiring movement of metabolites among cellular compartments, adaptation of metabolic pathways to meet special needs or circumstances, and assessment of flux through competing pathways. Specific mechanisms by which metabolic pathways respond to both internal and external signals such as direct metabolite control, covalent and non-covalent modification of enzymes, enzyme translocation among cellular compartments and enzyme turnover are considered in detail. Interpretation of experimental data is emphasized.

Instructors: F.I. Maclean and F.B. Palmer
Format: lecture 2 hours
Prerequisites: BIOC 3200 and 3300
Enrolment: 64

4403B & 4404A Molecular Biology of the Gene: These half-credit classes consider the duplication, transfer, and expression of genetic material. The experimental evidence for current concepts of gene structure and function is stressed. Students study the language of molecular biology and learn

about the experimental techniques peculiar to it. Lectures adopt a historical perspective so that students come to appreciate how the discipline of molecular biology has developed.

BIOC 4403B Genes and Genomes: This course discusses the organization of genes into genomes. It deals with (i) compartmentalization of genetic material in nuclear and organellar genomes, (ii) the structure, behaviour and origins of components of both nuclear and organellar genomes which are not genes (transposable and other repetitive elements, introns), (iii) genetic and physical methods for mapping genomes, and (iv) the significance of genetic organization and higher order chromosomal structure and function. The methodology and prospects of the human genome project will be discussed at some length.

Instructors: P. Liu and W.F. Doolittle
Format: lecture 3 hours
Prerequisites: BIOC 2030, 3400 & 4404 and MICR 3033

Cross-listing: MICR 4403B, BIOL 4011B

BIOC 4404A Gene Expression: The different mechanisms for regulation of gene expression in bacterial and eukaryotic cells, and their viruses, are emphasized. Particular topics include genomic, transcriptional, and post-transcriptional modes of regulation.

Instructors: H.-S. Ro and R.A. Singer
Prerequisites: BIOC 3400 or instructors' consent

Enrolment: 25
Cross-listing: MICR 4404A, BIOL 4010A

BIOC 4602R Honours Project & Thesis: The class requires laboratory research, at least one day per week and an interim report at the end of the first term. A final written report must be submitted at the end of the academic year.

Instructor: Class coordinator J.A. Verpoorte

Format: lab 1 day per week
Prerequisites: Permission by coordinator and a member of the department who will serve as supervisor

Exclusions: In exceptional cases the research project can be done outside the biochemistry department, prior approval must then be obtained from the class coordinator.

BIOC 4603A Advanced Laboratory in Biochemical Techniques: The class will consist of a series of laboratory modules (each of 4 weeks' duration, 1 day per week or 72 hours total, with flexibility to accommodate the need to attend other classes) The class is 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. Students in a concentrated Honours Biochemistry programme must complete 1 module from each section. Students in advanced major or other programmes may select their three modules from any section or sections, subject to availability of space. Such students should consult the department regarding prerequisites.

Instructors: C.J.A. Wallace and members of the departments of Biochemistry, Biology and Microbiology

Format: Lab 1 day

Prerequisites: BIOC 3200, 3300, and 3400

Cross-listing: BIOL 4012 and MICR 4601

Enrolment: 16

BIOC 4700A Proteins: Selected aspects of the chemistry of proteins are considered. Topics include relationships of structure and bioactivity, the forces that stabilize protein structures, and chemical and physical methods used to isolate and study proteins and other macromolecules.

Instructor: J.A. Verpoorte

Format: lecture 2 hours, tutorial 1 hour

Prerequisites: BIOC 3200 and CHEM 2301 and 2302 or instructor's consent

Enrolment: 64

BIOC 4701B Enzymes: Our current understanding of enzymic catalysis and its experimental basis are examined. The relationship between structures of catalytic and regulatory sites and their functions is considered for selected enzymes. The kinetics of enzyme-catalysed reactions are studied, as is the way in which binding of regulatory molecules influences kinetic behaviour and thereby regulates cellular metabolism.

Instructor: A.H. Blair

Format: lecture 2 hours, tutorial 1 hour

Prerequisite: BIOC 3200

Enrolment: 64

***BIOC 4800R Clinical Medical Biochemistry:**
To be offered in 1993.

***BIOC 4802R Principles of Instrumentation:**
This class examines the theory and practice of a wide range of modern instrumental techniques for clinical biochemical analysis.

Instructors: Members of the Department of Pathology

Format: lecture 3 hours, lab 4 projects

Prerequisite: BIOC 3200

Cross-listing: PATH 503

Enrolment: consult with the Department of Pathology

BIOC 4804A Introduction to Pharmacology I:
Described under BIOL 4404A.

BIOC 4805B Introduction to Pharmacology II:
Described under BIOL 4405B.

BIOC 8880 Honours Qualifying Examination:
Honours students must fulfil the requirements of this class (see Degree Requirements 1.3.5) by presenting two additional reports on their work in Biochemistry 4602. The first is a Progress Report, and the second an oral presentation at a special year-end Departmental Seminar.

Biology

Location Biology Wing, Life Science Centre, Main Office, 2nd floor, Room 2078
Telephone (902) 494-3515
Fax (902) 494-3736

Chair

J.H.M. Willison

Undergraduate Programme Advisors

C. Beauchamp (494-2145)
 C. Corkett (494-7016)
 A. Mille (494-7016)
 B. Retallack (494-7072)
 E. Staples (494-2464)

Honours Programme Advisors

P. Collins (Administration) (494-3847)
 J. Farley, Marine Biology (494-8587)
 M.J. O'Halloran, Marine Biology (494-2136)
 B. Freedman (494-3737)
 A. Pinder (494-3822)
 J. Wright (494-6468), until Dec '93

Emeritus Professors

L.C. Vining, MSc (Auckland), PhD (Cantab), FRSC
 K.E. von Maltzahn, MS, PhD (Yale)

Professors

R.G. Brown, MSc (McG), PhD (Rutgers)
 A.R.C. Chapman, PhD (Liv) (leave of absence)
 R.W. Doyle, MSc (Dal), PhD (Yale) Director, Gene Probe Laboratory
 J. Farley, MSc (Western), PhD (Man)
 J.C. Fentress, PhD (Cantab) (major appointment in Psychology)
 S. Freedman, MSc, PhD (Tor)
 B.K. Hall, PhD, DSc (UNE), FRSC, Killam, Research Professor
 O.P. Kamra, MS (NC State), PhD (Wash State)
 W.C. Kimmie, PhD (Lond) Dean of Faculty of Science
 P.A. Lane, MSc (SUNY Binghamton), PhD (SUNY Albany) (partial leave of absence)
 R.W. Lee, MA (Mass), PhD (SUNY Stony Brook)
 T.H. MacRae, MSc, PhD (Windsor)
 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
 D.G. Patriquin, MSc, PhD (McG)
 R.E. Scheibling, PhD (McG)
 J.H.M. Willison, PhD (Nottingham) - Chair
 E. Zouros, MSc, PhD (Agri Col Athens), PhD (Chlo)

Associate Professors

E.W. Angelopoulos, MS, PhD (Minn)
 R.G. Boutilier, MSc (Acadia), PhD (East Anglia) (leave of absence)
 R.P. Croll, PhD (McG), major appointment in Physiology and Biophysics
 G.S. Hicke, MSc (Carl), PhD (Sask)
 B. Pohajdak, MSc, PhD (Man)
 H. Whitehead, PhD (Cantab), University Research Fellow, (partial leave of absence)
 J.M. Wright, PhD (MUN)

Associate Professor (Research)

G.F. Newkirk, PhD (Duke)

Assistant Professors

A. Pinder, PhD (Mass) University Research Fellow
 S. Walde, PhD (Calgary) University Research Fellow

Adjunct Professors

J.D. Castell, MSc (Dal), PhD (Oregon State), Fish. & Mar. Serv., D.F.O.
 J.S. Craigie, MSc, PhD (Queen's), Marine Biosciences Inst., NRC
 E. Kenohington, BSc, MSc (Dal), PhD (Tasmania), D.F.O.
 M. Silver, PhD (Syracuse)

Senior Instructors

C. Beauchamp BSc., MSc (Memorial), BEd (Dal)
 J. Breckenridge, BSc (Queen's), MSc (Dal)
 P. Collins, BSc, MSc (Dal)
 C. Corkett, BSc, DipEd(Technical), PhD (London)
 P. Harding, BA (Tor), BEd, MSc (Dal)
 A. Mille BSc (Carlton)
 M.J. O'Halloran, BSc (South), BEd, MSc (Dal)
 E. Staples, BSc (Dal), BEd (MSVU)

Instructors

B. Retallack, BSc, MSc (Dal), PhD (Manchester)

Post Doctoral Fellows

P. Bentzen, MSc (UBC), PhD (McG)
 R.M. Ball, BSc (Carlton), PhD (Georgia)
 G. Claireaux, PhD (Brest)
 S. Ekanayake, PhD (Dal)
 A. Graveson, BSc (Bishop's), PhD (Ottawa)
 S. Gallager, PhD (Boston)
 T. Miyake, MS (Michigan), PhD (Texas A&M)
 J. Nelson, PhD (Michigan)
 S. Smith, MSc, PhD (Ottawa)
 C. Steiner, MSc (NAU), PhD (Mass)
 M. Zhang, MSc, PhD (Dal)

Areas of Specialty of Biology Faculty

Animal Biology: J. Farley, A. Pinder
Cell Biology: T. MacRae, W. Pohajdak, M. Willison

Developmental Biology: B.K. Hall, G.S. Hicks
Ecology/Environmental Studies: R.W. Doyle, B. Freedman, P. Lane, I. McLaren, R. Scheibling, S. Walde, H. Whitehead, M. Willison

Entomology and Parasitology: E. Angelopoulos
General Studies: K.E. vonMaltzahn
Genetics: R.W. Doyle, R.W. Lee, O.P. Kamra, E. Zouros

History of Biology: J. Farley

Marine Biology: J. Farley, R. O'Dor, R. Scheibling, H. Whitehead

Microbiology: R.G. Brown

Molecular Biology: J. Wright, W. Pohajdak

Physiology: R. Boutilier, R.K. O'Dor, D. Patriquin, A. Pinder

Plant Biology: G.S. Hicks, A.R.O. Chapman, M. Willison

3. For the standing required for honours, see section 22.3 in the College of Arts and Science regulations.

The basic Biology Honours Programme provides a broad background in the biological sciences and enough flexibility to allow some degree of specialization in a variety of subdisciplines. A suitable programme developed with an advisor and leading to an honours thesis in that area is excellent preparation for advanced studies. Some students may wish to choose a Combined Honours Programme. These programmes must be approved by the two departments.

Honours and Advanced Major in Marine Biology

Advisors: J. Farley, M.J. O'Halloran

The Biology Department recognizes the special needs of the rapidly expanding marine field and offers BSc Honours and Advanced Major Degrees in Marine Biology, including a Co-operative Education Programme.

Details of the Marine Biology programme will be found under a separate listing for Marine Biology at the end of the Biology section.

Degree Programmes

The department offers the following degree programmes: 15 credit (3 year) BSc and BA major; 20 credit (4 year) BSc and BA Advanced Major; concentrated, combined, or unconcentrated BSc and BA Honours; and, 20 credit BSc Advanced Major and BSc Honours in Marine Biology.

Major (15- and 20-Credit) BA, BSc

Consult the "Degree Requirements for the College of Arts and Science" section of this calendar for full details. The requirements include:

1. A grade of C or better in BIOL 1000R or BIOL 1001R
2. Four half credits to be selected from each of the four discipline areas in Biology at the 2000 level (see below for regulations for 2000 level classes).
3. For the 15 credit major, at least an additional two credits in Biology beyond the 2000 level.
4. For the 20 credit major, at least an additional four credits in Biology, three of which must be beyond the 2000 level.

Honours Biology, BA, BSc

Consult Regulation 1.3 of the general regulations of the College of Arts and Science. You should register for Honours before selecting the third year classes. For registration and class selection you should complete an application form (available in the Biology Main Office) and then consult with an Honours Advisor (listed above). In addition to the College Regulations, the requirements are:

1. BIOL 2020A or B; 2060A or B; 2030A or B; 3050A; two from 2001A, 2002B and 2101B. A grade average of B (GPA of 3.0) or above must be attained.
2. BIOL 4900R (thesis)

Classes Offered

Please note that BIOL 1000R or 1001R with a minimum grade of C is the prerequisite for all classes in the Biology Department.

Note: Due to the combined pressures of student numbers and a dearth of available space in some classes, the names of students not appearing on the first day of class may be deleted from class lists. Students are advised that being signed into a class is no guarantee of late admission.

Classes marked with an asterisk (*) are offered in alternate years. Consult timetable for current year.

Biology classes are grouped into four general categories:

1. 1000 - Level classes: BIOL 1000R and BIOL 1001R: These classes are intended to be introductory university-level classes in biology.

BIOL 1200R may be of interest to non-biologists.

2. 2000-Level Classes: All Biology majors (15, 20 credit and Honours) are required to take a core program at the 2000 level. Students should normally complete these core classes in their second year. The core programme is designed to provide a basis for more advanced studies in Biology as well as to ensure that all majors are exposed to

general discipline or subject areas of biology. A variety of skills including writing, oral presentation, computer literacy, library use, and problem solving are integrated into the curriculum of these core classes along with 'hands-on' activities in the laboratory or field. The second-year core programme covers four discipline areas; some evolutionary biology and some physiology will be included in these four areas:

- I Cell Biology
2020A or B
- II Diversity of Organisms (animals, plants and microbes)
2001A
2002B
2101B
- III Ecology
2080A or B
- IV Genetics and Molecular Biology
2030A or B

All students majoring in Biology are required to take a minimum of four, 2000-level, half-credits, with one half-credit class being selected from each of these 4 discipline areas.

Students interested in biochemistry are advised to take the second year biochemistry class offered by the Biology and Biochemistry departments. This class is not part of our core-programme but is a pre-requisite for entry into some higher level classes.

Students majoring in subjects other than Biology can design their own programmes and will not have to conform to these 2000-level core requirements. All students should ensure they have the necessary prerequisite classes required for entry into 3000-level classes.

Transition procedures: These 2000-level core requirements were introduced in 1990 and will apply to Biology honours and majors entering their second year from September 1990 onwards.

Biology honours and majors presently in their fourth year will still be able to follow the old regulations which can be obtained on a form available in the Biology main office. Fourth year biology majors wishing to take any of the new 2000-level classes should note the regulations given in the class descriptions below concerning which of the old 2000 level classes had similar content. Students who have already taken old 2000-level classes with similar content will be unable to receive additional credit in some of the new core classes.

3. 3000-Level Classes: These classes are mainly for second and third year students. No biology major will be allowed to register in any 3000 or 4000-level class without having

completed, or being registered in 2000-level classes in biology totalling at least two full credits.

4. 4000-Level Classes: These classes are primarily for honours or advanced major students. They are open to others with the permission of the instructor. Where biology classes are identified as being given in another department (e.g. Anatomy), that department should be consulted for details.

5. Microbiology: The following classes given in the Microbiology Department may be taken as a Biology credit toward BA, BSc, and BSc (Hons) Biology degrees even though they are not cross-listed with Biology: MICR 2100A, 3033B, 3114A, 3115A, 3118B, 4026A, 4027B, 4037A, 4038A, 4114B, 4115B, 4118A, and 4301A.

BIOL 1000R Principles of General Biology: This class surveys the fundamental principles of biology and is designed for those students wishing to major in biology or related subjects such as chemistry, physics, or mathematics. Students are encouraged to combine Biology 1000R with two of chemistry, physics, or mathematics in their first year. Biology 1000R is one of two options (see Biology 1001R) which prepare students for second year biology classes.

The class emphasis is on those features common to all organisms. It examines the requirements for life, its biochemical base, and its cellular organization. These are related to the function of whole organisms, their diversity, and evolution.

Format: lecture, 3 hours/week;
laboratory, 3 hours/week.

Instructors: Staff

Prerequisite: Senior high school level biology.

Enrolment: 350

BIOL 1001R Introductory Biology: This class is an introductory class which presumes no previous knowledge of biology. Students who wish to take a biology class that would allow further study in biology but who do not wish to be restricted in their choice of other classes by the suggested co-requisites for Biology 1000R are encouraged to take this class. Like Biology 1000R, this class prepares students for second year Biology classes.

Format: lecture 3 hours/week;
laboratory 3 hours/every other week

Instructors: C. Corkett, A. Mills, R.G. Brown, D.G. Patriquin

Enrolment: 350

Prerequisite: none

SCI 1200R: Science for Non-Science Students: An Overview of the Cosmos, Earth, and Life: The class meets the science

distribution requirement for BA students. There are no prerequisites and the class does not count as a prerequisite for any other science class. Students are introduced to selected concepts central to each of the disciplines of Geology, Biology, and Physics, and the origins of our universe, Earth and life on Earth. Emphasis is placed on developing an understanding of the scientific method, its limitations, and its application in society. The principles will be related to environmental concerns. For example the properties of light and radiation are applied to a discussion of global warming. The principles involved in ocean and atmospheric circulation are used to understand present problems of climate and pollution. Biological principles are applied to understand the consequences of changing habitats on biodiversity.

Instructors: E. Angelopoulos, P. Reynolds, R. Marsh

Cross-listings: ESCI 1200R, PHYS 1200R, BIOL 1200R

BIOL 2001A Marine Diversity: (Area II) The sea was the cradle of life and the origin of most phyla. This class explores the enormous variety of living and fossil organisms from the sea and looks at the special problems and adaptations of benthic, planktonic and nektonic species. It examines functional and taxonomic relationships using lectures, laboratories with living organisms, and a field trip.

Format: lecture 2 hours, tutorial 1 hour, laboratory 3 hours

Instructors: C. Corkett, R. O'Dor, R. Schelbling

Prerequisite: BIOL 1000R or 1001R (Grade C or better)

Enrolment: limited to 140 (28 per laboratory)

BIOL 2002B Terrestrial Diversity: (Area II) A survey of the terrestrial organisms. The class emphasizes the restrictions imposed on terrestrial adaptations by the aquatic origins of the colonizers, discusses the physiology of living in a terrestrial environment, looks at the domestication of plants and animals by man, and speculates on the future diversification of the earth environment and its inhabitants.

Format: lecture 2 hr, tutorial 1 hr, lab 3 hr

Instructors: A.H.Mills, and staff

Prerequisite: BIOL 1000R or 1001R (Grade C or better)

Enrolment: 140

BIOL 2010B Introductory Biochemistry: This class is described under Biochemistry, BIOC 2200B.

BIOL 2020A or B Cell Biology: (Area 1) An introduction to the eukaryotic cell. Major cell components and activities are described at ultrastructural and molecular levels with

emphasis on mammalian systems. The concept of the cell as an integrated structural, functional unit is developed.

Format: lecture 3 hours, laboratory 3 hours

Instructors: T.H. MacRae, B. Pohajdak, and B. Retallack

Prerequisite: BIOL 1000R or 1001R (Grade C or better)

Cross-listing: BIOC 2020A or B

Exclusion: BIOL 2015R/BIOC 2000R

Enrolment: 140

BIOL 2030A or B Genetics and Molecular Biology: (Area IV) Genes contain the biological information that specifies the cell and the organism. Therefore, genetics, the study of genes, is a means to understand the function and propagation of cells and organisms. The power and prominence of modern genetics have grown from a blend of classical and molecular approaches; both of these approaches are emphasized in this class. Major topics discussed include: the structure and function of DNA, the nucleic acid that comprises genes and chromosomes; transmission genetics, concerned with the propagation of genetic information; gene function, the expression of genetic information; and manipulation of DNA (genes) by genetic engineering. A range of organisms is considered, including bacteria, single-celled and multicellular eukaryotes, and viruses.

Format: lecture 3 hours, laboratory & tutorial 3 hours

Instructors: O.Kamra, R.A. Singer (Biochemistry), E. Staples, E. Zouros

Prerequisite: BIOL 1000R or 1001R (Grade C or better)

Cross-listing: BIOC 2030A or B

Exclusion: BIOL 2035R (last offered in 1989-90)

Enrolment: 176

BIOL 2060A or B Introductory Ecology: (Area III) Ecology is the study of the interrelationships of organisms and their environments. The broad subject of ecology focuses upon the interactions of plants and animals, including humans, with each other and with their non-living world. Three levels of ecology are studied: (1) Individuals, (2) Populations, (3) Communities and Ecosystems. Assignments and tutorials enlarge upon concepts presented in lectures. Students are instructed in elementary computer techniques and use the computer for most assignments. This class provides an overview of the science of ecology for the informed citizen, and also a good foundation for further work in ecology, marine biology and environmental studies.

Format: lecture 3 hours, laboratory/tutorial 3 hours

Instructors: C. Beauchamp, R. Doyle, R. Scheibling
Prerequisite: BIOL 1000R or 1001R (Grade C or better)
Exclusions: BIOL 2066, BIOL 2048R
Enrolment: limited to 150 (25/laboratory)

BIOL 2101B Microbial Diversity: (Area II) An introduction to the basic concepts of microbiology through lectures, laboratory sessions and demonstrations. The diversity and uniqueness of different microorganisms is emphasized, in addition to their structure, growth, metabolism and interactions. The involvement of microorganisms in fields such as medicine, industry and ecology is also discussed. Students who plan to repeat the class must obtain permission from the instructor before they register in the class. This class serves as a pre-requisite for all third-year Microbiology classes offered in the Biology and Microbiology departments. Students can take this as well as MICR 2100A as content is different.

Format: lecture 2 hours, laboratory 3 hours
Instructors: J. Breckenridge, B. Pohajdak
Prerequisite: BIOL 1000R or 1001R (Grade C or better or permission)
Enrolment: 140

SCI 3000R Science Fundamentals: A interdisciplinary class for Honours students in the Faculty of Science. It stresses the motivations, methodologies, and responsibilities of scientists, and provides extensive formal instruction in written and oral communication of scientific material. For details, see main calendar entry "Science, Interdisciplinary." Biology Honours students may count this class as a Biology credit if they wish.

Format: Lecture 3 hours
Prerequisite: None
Instructors: B. Clarke and staff
Enrolment: TBA

BIOL 3012A Introduction to Biological Chemistry: This class is described under Biochemistry, BIOC 3200A.

BIOL 3013B Intermediary Metabolism: This class is described under Biochemistry, BIOC 3300B.

BIOL 3014A Nucleic Acid Biochemistry and Molecular Biology: This class is described under Biochemistry, BIOC 3400A.

BIOL 3020A Advanced Cell Biology: Molecular and organellar aspects of cytoplasmic organization in eukaryotic cells are examined. A number of interrelated topics are discussed providing an opportunity to study new concepts in cell biology and to evaluate established ideas in the context of

recent findings. Students must supplement lectures with assigned readings and discuss selected subjects in essays.

Format: 3 lectures of 1.5 hours per week

Instructor: T.H. MacRae
Prerequisite: BIOL 2020A or B or BIOL 2015R (with a minimum grade of B-) or Instructor's consent limited to 20
Enrolment:

BIOL 3031B Molecular and Evolutionary Genetics: Topics to be covered in this class include molecular models of genetic recombination, elements of population genetics, evolutionary change in nucleotide sequences, rates and patterns of nucleotide substitution, molecular phylogeny and evolution by gene duplication, exon shuffling and transposition.

Format: lecture 3 hours, tutorials 2 hours every 2nd week

Instructor: E. Zouros
Prerequisite: BIOL 2030A or B
Exclusion: BIOL 2035R (last offered in 1989-90)

Enrolment: 50

***BIOL 3032B Cytogenetics: (not offered in 1993-94)** Detailed consideration of certain genetical and cytological mechanisms in relation to chromosomal modifications, gene mutations and evolution.

Format: lecture, 2 hours; laboratory, 3 hours

Instructor: O.P. Kamra
Prerequisite: BIOL 2030A or B
Enrolment: TBA

***BIOL 3034B Biological Effects of Radiation: (may not be offered in 1993-94)** A survey of current knowledge of the effect of ionizing radiation on biological material at three levels: physical, chemical and biological. In addition, methods of dosimetry, autoradiography, somatic and genetic effects, radiometric chemicals and bioassays are discussed.

Format: lecture 3 hours

Instructor: O. Kamra
Prerequisite: 1st year Biology and Chemistry
Enrolment: 20

***BIOL 3039B Human Genetics:** For students of Biology and Medicine with special interest in human genetics. Topics include human cytogenetics and abnormalities, inborn errors, genetic risk induced by environmental factors; prediction and detection of genetic risk, genetic counselling, genetic and non-genetic factors in behavioural characters and multi-factorial diseases; genetic variability; selection and genetic load in human populations; ethical and social issues associated with manipulation of human genetic pools.

Format: lecture 3 hours; laboratory 2 hours

116 Biology

Instructors: O. Kamra, P. Welch, E. Zouros
Prerequisite: BIOL 2030A or B
Enrolment: 40

BIOL 3050A Developmental Biology: The lectures describe development as a sequence of programmed events, in which 'simple' structures such as the fertilized egg are progressively transformed into complex organisms. These events are governed by a set of developmental 'rules'. Our knowledge of these rules comes from experimental study of developing systems such as sea urchins, frogs, peas, carrots, chick embryos and humans. Laboratories stress the use of live material and give students practice with such techniques as test tube fertilization in echinoderms.

Format: lecture/discussion 3 hours,
laboratory 3 hours

Instructors: P. Collins, B.K. Hall, G.S. Hicke

Prerequisite: BIOL 100R or 1001R (Grade C or better)

Exclusion: BIOL 2050A (last offered 89/90)

Enrolment: 100 (25/laboratory)

BIOL 3051B Advanced Animal Development: (May not be offered in 1993-94) This class is the follow-up to BIOL 3050A and deals with the mechanisms and controls which regulate the development of vertebrate and invertebrate embryos. Topics covered include cell determination and differentiation, morphogenesis, mechanisms of organ formation, inductive tissue interactions, growth, regeneration and wound healing. The two laboratory projects involve experiments designed to explore aspects of cell differentiation and morphogenesis, preparation of laboratory reports, and introduction to microdissection, sterile techniques, tissue recombinations and whole-embryo staining.

Format: lecture 3 hours,
laboratory/discussion 3 hours

Instructors: P. Collins, B.K. Hall

Prerequisite: BIOL 3050A (with a minimum grade of B-) plus completed or concurrent registration in second year cell/molecular classes from the old or new core.

Enrolment: 25

BIOL 3060B Environmental Ecology: This class considers the ecological effects of pollution, disturbance, and other stressors. Emphasis is on air pollutants, toxic metals, acidification, eutrophication, pesticides, forestry, extinction and warfare.

Format: lecture 2 hours,
laboratory/tutorial 3 hours

Instructor: B. Freedman

Prerequisite: BIOL 2060A or B (or see instructor)

Enrolment: No limit

Cross-listing: BIOL 5060B

BIOL 3061A Communities and Ecosystems: Major concepts and recent advances in community-ecosystem ecology are stressed; size-spectrum theory, evolutionary strategies of organisms and a delineation of contemporary ecosystem problems, especially those pertinent to the area of environmental impact assessment. The focus is on aquatic ecosystems - both freshwater and marine - and their major features are compared. The models, and community descriptions are discussed in the first half of the term.

Students also are given practical laboratory experience in associated methodologies. In the second part of the term, three major approaches to ecosystem analysis are compared. The laboratory parallels the lectures and gives experience in analyzing ecosystem data and applying theoretical techniques. In the tutorials, broader issues of environmental ecology will be presented by the students.

Format: lecture 2 hours; tutorial 1 hour; lab 3 hours

Instructor: P. Lane

Prerequisite: BIOL 2060A or B

Enrolment:

***BIOL 3062B Behavioural Ecology:** This class examines animal behaviour from an evolutionary perspective. Why do animals do what they do? Using the theory of natural selection as a basis, we will examine foraging, grouping patterns, territorial behaviour, parenting, mating behaviour, social organization, aggression and cooperation. There will be tutorials and laboratory/field and essay assignments.

Format: lecture 2 hours, tutorial 1 hour

Instructor: H. Whitehead

Prerequisite: BIOL 2060

Enrolment: 50

BIOL 3063B Resource Ecology: Introduction to sustainable development and the management of renewable resources. Topics vary from year to year but generally include fisheries population models and bioeconomics, wildlife and forest management, biological control strategies and agro-ecology, genetic containment and the protection of genetic diversity.

Format: lectures & seminars 3 hours

Instructors: R. Doyle, B. Freedman, S. Waide

Background: Introductory ecology, calculus and statistics classes or half-classes.

Enrolment: 60

BIOL 3066A Plant Ecology: (May not be offered in 1993-94) Various topics within the

field of Plant Ecology are discussed. At the ecosystem level, we deal with the cycling of energy and significant nutrients, and with successional changes in these processes. At the autecological level we deal with plant population biology, resource allocation, and physiological ecology. The plant environment is described in terms of energy budgets, soils, and water availability.

Format: lecture 2 hours, laboratory 3 hours, one/two field trips on weekends

Instructor: Staff

Prerequisite: BIOL 2080

Enrolment: no limit

Cross-listing: BIOL 5066A, ENVI 5120

BIOL 3059A Population Ecology: An examination of selected topics in population ecology. Topics include the effect of species interactions (predation, competition, mutualism) on population fluctuations, cycles and extinction. The relevance of theory to particular case studies such as lynx-hare cycles and biological control of winter moth will be discussed. Recent literature will be emphasized. Written assignments and exams will contribute to the final grades.

Format: lecture/tutorial 3 hours

Instructor: S. Waide

Prerequisites: Introductory Ecology, MATH 1010, 1060, or equivalent

Enrolment: 35

BIOL 3070R Principles of Animal Physiology: A discussion of the mechanisms which coordinate the activities of cells within multi-cellular organisms and permit such organisms to maintain a stable internal environment in a changing external environment. The emphasis is on the mechanisms most widely distributed through the animal kingdom. The laboratories are designed to illustrate these "principles of physiology" in a variety of organisms and to demonstrate the experimental approaches used to study physiology.

Format: lecture 3 hours, laboratory 3 hours

Instructors: R.P. Croll, R.K. O'Dor, A. Pinder, M-J. O'Halloran

Prerequisite: BIOL 2001A or 2002B

Exclusion: BIOL 3071R

Enrolment: 50

BIOL 3071R Physiology of Marine Animals: The problems of animals in a marine environment are quite different from those found in air or fresh water, but the "physiological principles" are similar. This class deals with the same principles as 3070, but emphasizes the special characteristics of marine animals and the techniques necessary to study them in laboratories and tutorials.

Format: lecture 3 hours, laboratory 3 hours

Instructors: R.P. Croll, R.K. O'Dor, A.

Pinder, M-J. O'Halloran

Prerequisite: BIOL 2001A or 2002B

Exclusion: BIOL 3070R, BIOL 3074A, BIOL 3075B

Enrolment: 20

***BIOL 3073B Plant Physiology:** (May not be offered in 1993-94) Topics include water relations, photosynthesis, respiration, nitrogen metabolism, transport, translocation, and some aspects of plant development, crop physiology and productivity.

Format: lecture 2 hours, laboratory 3 hours

Instructor: TBA

Prerequisite: BIOL 2002 or 2020 or instructor's consent

BIOL 3074A/3075B Physiology of Marine Animals Parts I and II: These classes will cover topics described already under BIOL 3070 and 3071 and are only open to Marine Biology Co-op (Honours and Advanced Major) students that are unable to take BIOL 3071R because of work term schedules. These Co-op students must take both classes, normally BIOL 3074A in their 3rd year and 3075B in their 4th year. All other students should take BIOL 3071R. The format, instructors, prerequisites, and exclusions are the same as listed under BIOL 3071R.

Enrolment: 15

BIOL 3100B Aquatic Microbiology: The main emphasis of this class is on the interactions of microbes and aquatic plants and animals including nutrition, disease, and immunization. The latter part of the class considers the role of microorganisms in nutrient availability and productivity in aquatic environments.

Format: lecture 2 hours, laboratory 3 hours

Instructors: R.G. Brown and D. Cone

Prerequisite: Normally, Biology 2101 or Microbiology 2100, but Marine Biology Honours students are exempt.

Enrolment: 35

BIOL 3211A Systematic Survey of the Algae: An examination of the taxonomic and evolutionary relationships of the algae. Considerable emphasis is placed on practical work (field and laboratory) where students become familiar with the algal components of the local flora.

Format: lecture 2 hours, laboratory 3 hours

Instructors: E. Kenohington

Prerequisite: grade C or better in BIOL 2001

Enrolment: 20

***BIOL 3212B Biology of the Algae:** (may not be offered in 1993-94) A non-systematic

examination of the cellular, organismic, population and community organizations of benthic and planktonic algae.

Format: lecture 2 hours, laboratory 3 hours

Instructor: A. Chapman

Prerequisite: grade C or better in BIOL 2001A

Enrolment: 25

BIOL 3215A Systematics of Higher Plants:

This class is largely concerned with the flowering plants. We cover the historical basis of classification from its classical origins, through the Renaissance, Linnaeus to the modern theorists. The new analytical techniques of phenetics, cladistics and chemotaxonomy are introduced as well as a critical examination of the Magnoliophyte Hypothesis and the origin of the Angiosperms. While not a class on the plants of Nova Scotia each student has to become familiar with a few plant families and submit a small collection of pressed plants (see instructor for details).

Format: lecture 2 hours, laboratory 3 hours

Instructor: P. Taschereau

Prerequisite: Biology 2002 or instructor's consent

Enrolment: 25

***BIOL 3218B Plant Anatomy:** Lectures will explore the internal organization of the leaves, stems, and roots of both the flowering plants and the cone-bearing plants, emphasizing the common plan that is found at the tissue system level of organization. All major cell and tissue types will be reviewed in the light of modern evidence which correlates structure with function. These surveys will embrace both the primary and the secondary plant bodies, and developmental aspects will be emphasized. Laboratory exercises will illustrate these concepts, focusing on the study of a variety of economically important woody and herbaceous crop plants.

Format: lecture 2 hours, lab 3 hours

Instructors: P.A. Collins, G. Hicks

Prerequisite: BIOL 1000R or 1001R

Enrolment: 50

BIOL 3220A Land Plants: A Survey: A survey of the biology, systematics and evolutionary history of the main divisions of land plants including: conifers and their gymnosperm allies; ferns, horsetails, ground pines, club mosses and liverworts. Flowering plants are excluded. A framework for discussion of the comparative morphology of these groups will be alternation of generations. Evolutionary adaptations to the land will be emphasized. Considering the fossil record in some detail, we will evaluate evidence for the origin of leaves, the seed

habit, gymnosperm cones and the seed habit. The class may be useful to those students considering the teaching profession, graduate study or who are interested in broadening their general knowledge.

Format: lecture/discussion 3 hours

Instructor: G. Hicks

Prerequisite: BIOL 2002B or permission of the instructor

Enrolment: 25

BIOL 3301A/3302B Invertebrates Parts I and II: These classes will cover topics described under BIOL 3321R, and are only open to Marine Biology Co-op students who are unable to take BIOL 3321R because of work-term schedules. These Co-op students must take both classes, normally 3301A in their 2nd year and 3302B in their 3rd year. All other students should take BIOL 3321R. The format, instructor, prerequisites, and exclusions are the same as for BIOL 3321R.

Enrolment: 15

BIOL 3321R Invertebrates: Recent fossil findings in the Burgess Shale of British Columbia and elsewhere plus methods of cladistic analysis have profoundly changed our understanding of the relationships between and within the various invertebrate phyla. Thus this class will not only examine the structure, function, and classification of the invertebrates, using live material from the marine environment as much as possible, but will come to terms with some of the new ideas about their phylogenies.

Recommendation: This class is designed not only for honours students in marine biology, but for anyone who loves "mucking about" with some of the world's most beautiful organisms.

Format: lecture 3 hours, laboratory 3 hours

Instructor: J. Farley, I. McLaren

Prerequisite: BIOL 1000R or 1001R (Third and fourth year Geology students interested in paleontology may take this class without any previous biology classes.)

Exclusion: BIOL 3301A and BIOL 3302B

Enrolment: 40

BIOL 3322A Parasitology: The lectures emphasize the parasite-host relationships, evolution of the parasites and adaptations to the host, modifications of physiology, structure and life cycle for a parasitic existence. Examples are taken from all major animal groups where a parasitic mode of existence has developed beginning with the protozoa. Since the most extensive research pertains to parasites of man, the emphasis is on human parasites. Recommended for

Ecologists and Pre-Meds. The laboratory stresses recognition and identification of parasites.

Format: lecture 2 hours, laboratory 3 hours

Instructor: E. Angelopoulos

Enrolment: 48

BIOL 3324R Entomology: Entomology is an important branch of academic biology and also one of the largest divisions of applied biology. The class is an introduction to the study of insects dealing with: (1) The classification and evolutionary diversity of insects. (2) The biology, ecology and behaviour of insects. (3) Applied aspects — medical, agricultural and forest entomology, harmful and beneficial insects; biological control of insects.

Format: lecture 2 hours, laboratory 3 hours

Instructor: E. Angelopoulos

Enrolment: 24

BIOL 3326B Vertebrate Design: Evolution and Function: Design of organisms is the result both of evolutionary history and natural selection for function. Organisms have to work, but do not have to be the best possible design. In this class we will analyse current designs found among the vertebrates in terms of vertebrate evolutionary history and functional morphology. This class will be particularly valuable in conjunction with BIOL 3070R/3071R.

Format: lecture 3 hours

Instructors: A.W. Pinder and R.J. Wasseraug

Prerequisites: Biology second year core

Enrolment: 75

***BIOL 3402A The Rise of Modern Science:** The modern world has been fundamentally altered by science and technology. In what ways? How has this come to be? This class will attempt to answer these questions by looking at the origins of modern science and technology in the 16th and 17th centuries, its growth of popularity in the 18th, and the rise of the scientific profession and science-based industry in the 19th and 20th centuries. **Recommendation:** This class is designed for students in the arts and the sciences who have some interest in history and/or philosophy. Science students in particular should realize that a considerable amount of reading and writing will be required in this class.

Instructors: J. Farley, R. Ravindra

Cross-listing: HIST 3072; PHYS 3402; CREL 3502

Prerequisites: No formal prerequisites, but students **must** be in their 3rd or 4th year and **must** have at least a B average.

Enrolment: 30

***BIOL 3403A or B History of Biology:** The class deals with the history of the biological sciences in the 19th and 20th centuries, with emphasis on systematics, evolution, genetics, embryology and molecular biology. This class is designed for honours and majors in biology and geology, who have some interest in the history of their discipline.

Format: class 3 hours

Instructor: J. Farley

Enrolment: 30

***BIOL 3404A or B History of Medicine:** This class deals with the history of medicine in the 19th and 20th centuries. It will stress the impact of the medical sciences (physiology, pathology, bacteriology etc.) on the theories and practice of medicine from the 1880's to the present. This class is designed for pre-medical students and students in the health professions.

Format: class 3 hours (evenings)

Instructor: J. Farley

Cross-listing: HIST 2995A or B

Enrolment: 100

BIOL 3421B Comparative Vertebrate Histology: An advanced histology course surveying the whole range of vertebrate tissues and organs.

Format: lecture 2 hours, lab 2 hours

Instructor: D.M. Chapman (Anatomy and Neurobiology Dept.)

Prerequisite: BIOL 3430A

Cross-listed: ANAT 3421B

Enrolment: 15

BIOL 3430A Introduction to Human Histology: Histology is the study of the structure of cells, tissues and organ systems, and utilizes information derived from both light and electron microscopy. It complements studies in anatomy, cell biology, physiology and biochemistry, broadening the understanding of how organisms function.

Format: lecture 2 hours, laboratory 2 hours

Instructor: D.H. Dickson (Anatomy and Neurobiology Dept.)

Prerequisites: BIOL 2020A, or 2015R or permission of instructor

Cross-listings: ANAT 2160A, PHYT 2160A

Enrolment: 48

BIOL 3435R Anatomy: A comprehensive review of the gross anatomy of the human body with special emphasis on musculoskeletal, cardiovascular and respiratory systems.

Format: lecture 3 hours, laboratory 4 hours

Instructor: R.E. Clattenburg (Anatomy and Neurobiology Dept.)

Prerequisites: instructor's consent

Cross-listings: ANAT 2170R, PHYT 2170R

Enrolment: limited to 30

BIOL 3440B Neuroanatomy: A survey of the histology, development and organization of the central nervous system, with emphasis on the developmental and structural relationships between spinal cord and brainstem. The organization of cranial nerves and microanatomy of the brain stem is discussed. The organization of sensory and motor systems is presented in detail. The cerebral cortex, cerebellum, basal ganglia, and limbic system are also covered.

Format: lecture or laboratory 3 hours
Instructor: D.A. Hopkins (Anatomy and Neurobiology Dept.)

Prerequisite: BIOL 2020A or B or 2015R or permission of instructor

Cross-listing: ANAT 0210B, NESC 3440B and PHYT 2100B

Enrolment: 30

BIOL 3580A or B Philosophy of Biology: This class is described under Philosophy, PHIL 3420B

BIOL 3601A Nature Conservation: Previously called "Man in Nature", the course traces the development of human economy and the resultant impact on the wild environment. Particular attention is paid to human population dynamics, biotic extinctions and land-use patterns. Having identified the causes of impoverishment of biodiversity the course examines possible cures, including: sustainable development, conservation science and environmental ethics. Special attention is paid to the establishment and management of protected areas.

Format: Lecture/tutorials

Instructor: M. Willison

Prerequisites: BIOL 1000 or 1001 or BIOL/ESCI/PHYS 1200, or permission of instructor

Enrolment: 150

Exclusion: Biol 3410B taken in 91/92 or 92/93

BIOL 3614C Field Ecology: (Not offered 1993-94) The class provides practical experience in techniques of quantitative field ecology, including design of field sampling programmes and manipulative experiments. Students examine specific ecological questions and hypotheses by collecting, analyzing and interpreting field data and writing scientific reports. Projects focus on intertidal and subtidal systems but involve concepts and techniques that have broad application in ecology. Lectures provide the theoretical background to projects and the rationale for methodology and statistical analysis. Topics include: spatial pattern, zonation, animal movement, disturbance and succession, and herbivore-plant interaction.

Format: 5 projects involving 7 days of field work in September; laboratory or lecture first term only

Instructor: R. Scheibling

Prerequisites: BIOL 2060 and MATH 1060, 1070 or equivalent

BIOL 4010A/BIOC 4404A Gene Expression: This class is described under Biochemistry, BIOC 4404A.

BIOL 4011B/BIOC 4403B Genes and Genomes: This class is described under Biochemistry, BIOC 4403B.

BIOL 4012A or B Advanced Laboratory in Biochemical Techniques: This class is described under Biochemistry, BIOC 4063A.
Cross-listing: MICR 4801

BIOL 4024A Microscopy: The class is concerned with biological ultrastructural analysis concentrating on transmission and scanning electron microscopy. Electron microscopy, including ancillary techniques, is considered in depth. The importance of a proper understanding of the physical and/or chemical principles governing technical procedures such as fixation, freeze-fracture, colloidal gold probes, stereology, autoradiography, x-ray microanalysis and photography are emphasized. During laboratory periods students have the opportunity through individual projects to participate in some of the techniques covered in the lectures. This class is designed primarily for honours and graduate students.

Format: lecture 2 hours, no formal lab
Instructors: G. Faulkner, K.B. Easterbrook, D.B. Stoltz

Prerequisites: Instructor's consent

Cross-listing: MICR 4024A, BIOL 5025A

Enrolment: 12

***BIOL 4060A Marine Mammalogy:** The class will examine the characteristics that mammals brought with them when they returned to the ocean, the evolution of the different groups of marine mammals, some of their special adaptations, the roles of marine mammals in oceanic ecosystems and general principles of the marine mammal population biology. Finally we will consider the factors that regulate marine mammal populations and how these influence attempts to manage and conserve them. Assignments will include dissections of a seal and/or porpoise, a review essay on some marine mammal adaptation, exploring a computer model of a marine mammal population, and an examination.

Format: lectures/discussion/tutorials 3 hours, and some labs

Instructors: I.A. McLaren (plus others)

Prerequisites: BIOL 2060 and 3069 or see instructors

Enrolment: 15

BIOL 4061C Experimental Design and Data Analysis in Biology: The purpose of this class is to introduce students who have previously taken formal classes in statistics to the practice and pitfalls of experimental design and data analysis in biology. Using many real examples, especially from the ecological literature, we will show how experiments should be designed and analysed in different situations, with emphasis on potential problems and how they may be overcome. We will also introduce some of the more common techniques used in the analysis of univariate and multivariate biological data.

Format: lecture, 2 hours/tutorial every other week

Instructors: R. Scheibling, H. Whitehead

Prerequisites: STAT 2070/2080; offered to well prepared honours students as well as graduate students

BIOL 4064C Pleistocene Biogeography: (may not be offered in 93/94) Lecture, discussion, and laboratory experience in the reconstruction of environmental change during the Pleistocene epoch. Laboratory and field experience pay particular attention to the environmental history of the Maritime region, including environmental changes caused by man. Techniques of pollen and diatom analysis, plant and animal macrofossil study, dendrochronology, geochemical and isotopic dating methods are explored. Field and laboratory work include a class problem in an area in the Halifax region.

Format: laboratory 3 hours

Instructor: TBA

Prerequisites: At least two credits in Biology or Geology; Instructor's consent

Cross-listing: ESCI 4064C

BIOL 4068A Limnology: (may not be offered in 93/94) The class is divided into four sections: (A) Physical Limnology — geology, morphometry, thermal properties, system hydrology & budgets, optical properties, vegetational interactions, history of limnology in N.S.; (B) Chemical limnology — oxygen, acidity/alkalinity, physical/chemical interactions, major/minor ions and heavy metals, organic molecules, atmospheric geochemistry, ionic budgets and mass balances; (C) Biological limnology — palaeolimnology, microbiology/phytoplankton, quantitative geochemistry, zooplankton/invertebrates, vertebrates, sampling technology; (D) Cultural limnology — eutrophication, BOD/COD, phosphorus loading, environmental impact assessments, acid rain, future shock.

Format: lecture 3 hours, laboratory/tutorial 3 hours

Instructor: TBA

Prerequisites: BIOL 2060

***BIOL 4070C Advanced Topics in Animal Physiology:** (may not be offered in 93-94) Whereas the introductory animal physiology classes emphasize common principles, this class emphasizes the diversity of physiological solutions to common problems among animals. A different problem is chosen each year and each student presents a seminar reviewing the literature of a particular animal's solution and applies advanced techniques in an experimental study of the animal. Students choose the animal and the technique.

Format: lecture 2 hours, open laboratory

Instructors: R.P. Croll, R.K. O'Dor, A. Pinder

Prerequisite: BIOL 3070 or 3071

***BIOL 4072A or B Animal Nutrition:** (May not be offered in 1993-94) General principles and techniques of animal nutrition are reviewed and used to examine current literature. Emphasis is on the assessment of nutrition requirements of aquatic and marine species.

***BIOL 4101B Industrial Microbiology and Biochemistry:** This class considers the industrial and environmental applications of micro-biology, particularly the industrial processes, like brewing, manufacturing, anti-biotic production, and waste water management. A fundamental and practical understanding of the biochemistry of these processes is a key component.

Format: lecture and seminar 2 hours

Instructor: M. Silver

Prerequisite: BIOL 2101B or MICR 2100A

Enrolment: TBA

BIOL 4113B Biology of the Prokaryotic Cell: (May not be offered in 1993-94) Although the class concentrates on the structure and function of the bacterial cell envelope, that is, the capsule, cell wall and cell membrane, other topics such as the physiology of obligate anaerobiosis, sporulation, motility etc. are also covered. As part of this class, students will write one essay.

Format: lecture 2 hours

Instructor: R. Brown

Prerequisite: MICR 2100A or BIOL 2101B and CHEM 2400 or BIOL 2010

Enrolment: 24

***BIOL 4214B Physiology of Marine Algae:** (May not be offered in 1993-94) A comparative study of the physiology and biochemistry of the various algae classes is

conducted, including studies of carbohydrates, proteins, fats, pigments and nutrition.

Format: lecture 3 hours
Instructor: J. Craigie
Prerequisite: Permission of instructor

BIOL 4303B Molecular Immunology: An advanced class which investigates the molecules involved in the generation and expression of immune responses. Topics typically include the structure and function of cytokines, the generation of antibody diversity by immunoglobulin gene rearrangement, the structure and function of cell surface receptors such as the T cell antigen receptor, MHC and adhesion molecules, and the molecular interactions which lead to immune non-responsiveness.

Format: lecture, student presentations, discussion

Instructors: T. Lee, A.W. Stadnyk, B. Pohajdak

Prerequisites: MICR 3115A and/or instructor's consent

Cross-listing: MICR 4303B/5303B

BIOL 4369B Fisheries Oceanography: This class is described under Oceanography, OCEA 4160B. (may not be offered in 1993-94)

BIOL 4403R Human Physiology: A class dealing with the physio-chemical basis of the physiological processes in humans.

Format: lecture 3 hours
Instructor: N. Morgunov (Physiology/Biophysics Dept.)

Prerequisites: Introductory classes in Biology, Chemistry and Physics. Permission of the instructor is required.

Cross-listing: PHYL 2010R and 4403R

BIOL 4404A Introduction to Pharmacology I: This introductory class is designed to acquaint students with the actions of drugs on physiological and biochemical functions in mammals including humans. The interaction of drugs with the central and peripheral nervous systems will be covered. Factors which affect the blood levels of drugs (absorption, distribution, metabolism, and elimination) will be considered, together with the mechanisms by which drugs act and their potential uses.

Format: lecture 2 or 3 hours
Instructors: H. Robertson, J. Blay (Co-ordinator)

Prerequisite: Permission of Co-ordinator
Cross-listing: PHAC 5406A, BIOC 4804A, NESC 4374A

Enrolment: 35

BIOL 4405B Introduction to Pharmacology II: This class is intended to cover specific aspects of drug action in greater depth than

4404A and to provide students with practical expertise in pharmacology. The laboratory component consists of prescribed exercises using varied techniques.

Format: lecture 3 hours, laboratory 3 hours

Instructors: H. Robertson, J. Blay (Co-ordinator)

Prerequisite: Permission of Co-ordinator
Cross-listing: PHAC 5407B, BIOC 4805B, NESC 4375B

Enrolment: 20

BIOL 4600B Invertebrate Fisheries and Aquaculture: Subject matter will deal with commercially exploited invertebrates (crustaceans and molluscs) with a heavy emphasis on bivalves. Topics to be covered include: (1) Review of the major invertebrate harvest fisheries (locations, methods, population cycles, fisheries models) (2) Biology and ecology of the Bivalvia (feeding, bioenergetics, growth, and reproduction) (3) Shellfish aquaculture (methods, species, site location, economics). These topics will be covered with respect to the Maritimes as well as non-local fisheries. Course structure will be a mixture of lecture and class discussions. Course requirements will include a research paper and oral presentations.

Format: lecture/discussion 3 hours
Instructors: J. Grant, G. Newkirk, R. Mohn

Prerequisites: BIOL 2001A, 2060A or B, and 3321R; fundamental knowledge of statistics; instructor's consent

Cross-listing: OCEA 4600/5600, BIOL 5600B

BIOL 4650B Resource Systems and Economic Development: (may not be offered in 1993-94) Major theories of natural resource management have evolved rather separately through economic, behavioural and ecological disciplines. The interphases of ecology with these other disciplines and the criteria which may be used to weigh ecological inputs in economic development planning processes are the major topics to be covered. Current approaches and analytical techniques are described. These illustrate adaptive strategies for long-term resource use, pest and disease control. The course may focus on specialized topics such as fisheries or tropical resource management, as announced in advance. The class includes an introduction to practical problems of project cycles, of defining objectives and of budget analysis. It is open to students from any faculty by permission of the instructor.

Format: lecture/seminar 3 hours
Instructor: M. Gardner (Inst. for Resource & Environmental Studies)

Prerequisite: Permission of instructor
Cross-listing: ENVI 5020B
Enrolment: TBA

BIOL 4660A Introduction to Biological Oceanography: Quantitative descriptions of biological oceanographic processes are used to explore interactions with physical and chemical processes in various oceanic ecosystems. Topics discussed range from factors affecting rates of microalgal photosynthesis to expected response of the ocean ecosystem to global variation in carbon dioxide and climate. Laboratory emphasizes independent, original research.

Format: lecture 2 hours, laboratory 1 plus hours

Instructor: C. Boyd. (Oceanography Dept.)
Prerequisites: Biology 2060A or B or 2046R or equivalent, Meth 1000A or B/C, 1010A or B, and instructor's consent

Cross-listing: OCEA 4150A/5150A

BIOL 4662B Biology of Phytoplankton: The role of phytoplankton as primary producers of organic material in the sea, and as agents of biogeochemical transformations, is explored in the context of interactions with physical and chemical oceanographic processes. Emphasis is on the current literature.

Instructor: M. Lewis
Cross-listing: OCEA 4230B

BIOL 4664B History of Oceanography: This class describes the development of Oceanography from biological, chemical, physical, and geological knowledge going back to the 18th century in scientific, political and social contexts. Includes: plankton dynamics, deep sea biology, ocean circulation and plate tectonics.

Format: lecture and seminar
Instructor: E.L. Mills (Oceanography Dept.)

Prerequisite: Instructor's consent, Science or History

Cross-listing: OCEA 4331B/5331B
Enrolment: no limit

BIOL 4866B Benthic Ecology: This class is described under Oceanography, OCEA 4330B. (may not be offered in 1993-94)

BIOL 4800 Special Topics: Available as 4806A, 4807B, 4808C. Arranged by consultation with staff and with approval of the Curriculum Committee.

BIOL 8700A or B Co-op Seminar I (non-credit)

BIOL 8891 Co-op Work Term I

BIOL 8892 Co-op Work Term II

BIOL 8893 Co-op Work Term III

BIOL 8894 Co-op Work Term IV

BIOL 4900R Honours Research and Thesis: Compulsory class in honours programme.

Format: Student seminars
Instructor: P. Collins, J. Wright, and staff
Enrolment: 40

Marine Biology

Honours and Advanced Major in Marine Biology

The Biology Department offers a 4 year Honours and a 4 Year Advanced Major degree in Marine Biology. Since 1991, we have also been offering these two degrees as a Co-operative Education degree (Marine Biology Co-op) where students integrate work experience into their academic programme.

These programmes are designed to provide a fundamental background in biological science while permitting concentration in Marine Biology. The Advanced Major prepares students for technical positions in government fisheries laboratories, fish farms, etc. The honours programme is more rigorous and provides research experience during the thesis and is intended for students wishing to continue with further research training at graduate school.

The resources of the departments of Biology and Oceanography are combined in the Life Sciences building which is equipped with a sophisticated flow-through sea-water system. The Life Sciences centre is located very close to the sea coast and this enables many classes to offer field work.

Co-operative Education Programme in Marine Biology, Honours and Advanced Major

Programme Co-ordinator

M.J.O'Halloran

The Co-operative education degree is an integrated programme of 8 academic terms and 4 work terms in industry, government laboratories, aquaculture farms, etc. The work terms, each of 4 months duration, enables students to apply their knowledge of marine biology and provides them with work experience for making intelligent career choices. Upon successful completion of the programme the student's transcript indicates the programme was a co-operative one. The Co-op degree normally takes 4 1/3 years to complete.

The Work-study programme

The work terms are of 4 months duration and alternate with study terms as follows:

Year	Fall	Winter	Summer
1	AT1	AT2	Free
2	AT3	AT4	WT1
3	AT5	WT2	AT6
4	WT3	AT7	WT4
5	AT8	Graduation	

AT = Academic term

WT = Work Term

The Faculty's Co-op Placement Officer serves to co-ordinate the contacts between students and employer. Students are remunerated according to the employer's policies regarding permanent employees of similar training and education. At the end of each work term, each student must submit an acceptable work report.

The academic programme and required classes for Honours and Advanced Major Co-op students are essentially the same as for the non co-op programme (listed below). Students in the third and fourth year of their co-op programme will have difficulty taking full-credit R classes during the academic year because of their work terms. The 2 required full-credit third year biology classes (Biology 3321R and 3071R) will be split into Part 1 (A term) and Part 2(B term) so that students can take Part 1 in the fall term of their third year and Part 2 in the winter term of their fourth year.

Many employers require basic computer skills (word-processing, data-base management) so students are advised to take non-credit (Henson College) or credit classes during their first 2 years.

During their second year Co-op students must attend a few non-credit seminars to prepare them for their work term placements.

Eligibility

Students should obtain application forms from the Marine Biology Co-op Co-ordinator at the end of their first year. They should also contact the Co-op Co-ordinator during their first year of study to have their programme checked.

Both Honours and Advanced Major Co-op students are required to demonstrate sufficient academic potential and maintain a B average or higher, with no mark lower than B- in Biology 1000R, 2001A, 2020A or B, 2030A or B, 2060A or B. Students must also be Canadian citizens or landed immigrants.

Honours in Marine Biology

Programme Advisor:

J. Farley

Honours students must take a minimum of 9 and a maximum of 11 credits in their major subject (Marine Biology/Biology) above the 1000 level in addition to the general rules of the College of Arts and Science (see degree requirements in the College of Arts and Science section of this calendar).

Students are recommended to take Oceanography as their minor subject and 2 credits are required.

Honours students are also expected to undertake a research project and thesis (Biol

4900R) in a marine field with a member of the department or one of our honorary research associates. Consult the Marine Biology Co-ordinator or the Biology Office for a list of these associates, many of whom are located at Fisheries and Oceans laboratories or the Bedford Institute of Oceanography.

For the standing required for Honours please see "Graduation Standing" section "Academic Regulations" given earlier in this calendar.

Our department requires marine biology honours students to obtain a B average with no mark less than B- in the following second year classes:

BIOL 2001A, 2020A or B, 2030A or B, and 2060A or B. These classes must be completed by the end of year 2.

Curriculum

Descriptions for the these classes can be found under their subject area in the appropriate section of this calendar.

Mandatory Core classes:

Year 1 BIOL 1000R (Principles of general biology) or BIOL 1001R (Introductory Biology)

CHEM 1010R (General chemistry) or CHEM 1040R

MATH 1000A (Differential and integral calculus)

MATH 1060B Introductory statistics for science and health sciences)

1 writing class elective

1 Language and Humanities elective

OR

1 Social Science elective(if not covered by writing class)

Year 2 BIOL 2001A (Marine diversity)

BIOL 2020A or B (Cell biology)

BIOL 2030A or B (Genetics and Molecular Biology)

BIOL 2060A or B (Introductory ecology)

OCEA 2850R (Introduction to Oceanography) or OCEA

2851A/2852B (Introduction to Oceanography Parts 1 and 2) for Co-op students only.

1 Language and Humanities OR

1 Social Science elective(If not covered by writing class.

BIOL 8700A (Work-term preparation seminars) for co-op students only.

Summer of Year 2 or 3

1 half-credit Biology Field class: BIOL 3013A (Natural History and field biology) offered by Acadia university

or any recognised field class at the Huntsman Marine, Bermuda Biological or other approved stations.

Year 3 and 4

BIOL 3071R (Physiology of Marine Animals) or **BIOL 3074A** and **3075B** (Physiology of Marine animals Part 1 and 2) for Co-op students only,
BIOL 3212A (Biology of Algae) or **BIOL 3211B** (Systematic survey of the algae)

BIOL 3321R (Invertebrates) or **BIOL 3301A** and **3302B** (Invertebrates Part 1 and 2) for Co-op students only.

BIOL 4081A (Experimental design and data analysis)

BIOL 4900R (Honours research and thesis)

STAT 2080A or **B** (Statistical methods for data analysis and inference)

Suggested biology credits and electives

The following 3rd and 4th year classes are marine related and could be used for obtaining more biology credits or serve as electives. Other biology classes can also be taken if students want to concentrate in a specific area such as ecology, molecular or developmental biology but please discuss this with your Marine Biology programme Advisor first.

All students should ensure they have the necessary pre-requisite classes for entry into higher level classes.

Aquaculture **BIOL 4600B** (Invertebrate fisheries and aquaculture)

Development **BIOL 3050A** (Developmental biology)

Animal Diversity **BIOL 3328B** (Vertebrates and evolution), **BIOL 405.0** (Biology of fishes) offered by St.Mary's university, **BIOL 4080B** (Marine Mammalogy)

Ecology **BIOL 3061B** (Communities and ecosystems), **BIOL 3069B** (Population ecology), **BIOL 4666B** (Benthic ecology)

Geology **GEOL 4280B** (Marine geophysics)

Microbiology **BIOL 3100B** (Aquatic microbiology)

Oceanography

BIOL 4660A/OCEA 4150A (Introduction to biological oceanography)

BIOL 4662B/OCEA 4230B (Biology of phytoplankton)

OCEA 4170A (Introduction to physical and chemical oceanography)

OCEA 4260A (Biology of zooplankton)

OCEA 4380B (Marine modelling)

OCEA 4664B (History of Oceanography)

Limnology **BIOL 4068A** (Limnology)

Physics **PHYS 1300R** (Physics in and around you)

Physiology **BIOL 4070C** (Advanced topics in animal physiology)

Politics **POLI 3590R** (Politics of the Sea)

Resource management/economics **BIOL 3063B** (Resource ecology), **BIOL 4650A** (Resource systems and economic development), **ECON 361B** (Fisheries economics) offered at St.Mary's University).

Science **SCI 3000R** (Science fundamentals)

Classes at St. Mary's University

Biology of Fishes 405.0R: (may not be offered in 1993-94, check Biology Dept at SMU) A study of fishes, their classification, growth and development, ways of life and management. The laboratory portion of the course familiarizes students with representatives of world taxa and the study of fishes in Nova Scotia.

Format: Lectures 3 hrs and lab or fieldwork 3 hrs a week for 2 terms

Instructor: Staff

Prerequisites: **BIOL 2001A**, **STATS 1060A** or **B**

Fisheries Economics 361.1(2)B: This class emphasizes the application of economic concepts to problems of fishery management and development. Topics to be discussed include: common property resources, the economics of fishery regulation, socioeconomic, fish markets, and the fishery as part of the national and regional economy. Particular attention will be paid to current issues in the Atlantic Canada fishery. (Check with the Finance and Management Science Dept at SMU to see if offered in 1993-94)

Format: Classes 1.5 hrs, seminars 1.5 hrs a week in B term

Instructor: T. Charles

Prerequisites: Instructor's consent. An introductory economics class would be useful.

Advanced Major (4 year) Degree in Marine Biology

Advanced major students are required to take a minimum of 6 and a maximum of 9 credits above the 1000 level in their major subject (Marine biology/Biology) in addition to the general rules for Advanced majors which are listed in the degree requirements section of the College of Arts and Science regulations in this calendar.

Curriculum

Descriptions of these classes can be found under their subject area in this calendar.

Mandatory classes

Year 1 BIOL 1000R (Principles of general biology) or BIOL 1001R (Introductory Biology)

CHEM 1010R (General chemistry) or CHEM 1040

MATH 1000A (Differential and integral calculus)

STAT 1060B (Introductory statistics for science students)

1 Writing class elective

1 Language and Humanities OR

1 Social Science elective (if not covered already by writing class)

Year 2 BIOL 2001A (Marine Diversity)

BIOL 2020A or B (Cell biology)

BIOL 2030A or B (Genetics and Molecular biology)

BIOL 2060A or B (Introductory ecology)

Summer of Year 2 or 3

A half-credit field class:

e.g. BIOL 3013A (Natural history and field biology) offered by Acadia university or any recognised field class at the Huntsman Marine, Bermuda Biological, or other approved stations.

Suggested Biology credits or electives

These can be selected from any of the "mandatory" or "suggested" marine related classes listed earlier in the Marine Biology Honours programme with the exception of BIOL 4900R.

Other biology classes may be taken if students wish to concentrate in a particular subject area of Marine Biology such as ecology, molecular or developmental biology but this should be discussed first with the Marine Biology programme co-ordinator.

School of Business Administration

Location: 6152 Coburg Road
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.

The undergraduate programme includes studies in the humanities and social sciences as well as in the functional areas of business. Recognition is given to the growing emphasis on quantitative and behavioural analysis.

Administrative Staff 1992/93

Director, School of Business Administration

Leonard C. MacLean

Director, Centre for International Business Studies

Philip J. Rossen

Director, Courseware Development Project

Donald P. Sheridan

Co-ordinator, Canada/China Management Education

Programme, Dalhousie/Xiamen Linkage, Dalhousie/Zimbabwe Linkage

Cecil R. Dipchand

Director, Academic Programmes

Edgar W. Soott

Director, Co-op Programme

John R.E. Parker

Administrative Assistant

Susan M. DeYoung

Academic Staff 1992-93

Emeritus Professors

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

R.E. George, BSo (Lond), MA (Bristol), PhD (Lond)

Professors

M.R. Brooks, BOT (McG), MBA (Dal), PhD (WVnes)

F.G. Crane, BA (Aoadia), DPA, MPA (Dal), PAdm (ICSAC), PhD (Bradford)

C.R. Dipchand, BComm, (Queen's), MBA (Sask), PhD (Western)

I. Fooladi, BS (Iran), MA (Tehran), MS, PhD (Oregon)

L.C. MacLean (Director), BA, BEd (StFX), MA, PhD (Dal)

J.D. McNiven (Dean, Faculty of Management), BA, MA, PhD (Mich)

M.J.C. Martin, BSo, (Nottingham), PhD (Sheffield) (on leave January-June 1994)

J.R.E. Parker, (Associate Dean, Faculty of Management), BComm (Dal), MBA (Wash), CPhil (Mich), FCA

G.S. Roberts (Bank of Montreal Chair), AB (Oberlin), MA, PhD (Boston Coll)

P.J. Rossen, Dip MS (Salford), MA (Lancaster), PhD (Bath)

Yassin Sankar, BA (McG.), MA (Tor.), PhD (Johns Hopkins)

D.A. Schellinok, BSo, MBA (Dal), PhD (Ill)

Associate Professors

B.C. Archibald, BA (Queen's), MSo (Stanford), PhD (Waterloo)

R.G. Blunden, BComm (Dal), MM (Northwestern)

R. Carroll, BBA, BEd (St.FX), MBA (Dal), FCGA

D.C. Cherry, BComm (Dal), MBA (McM), CMA

J.E.D. Conrod, BComm (Dal), MBA (Tor), CA

C.J. Dirksen, MBA (Oregon), BS (Santa Clara), PhD (Oregon)

J.F. Duffy, BS, MS, PhD (Iowa)

R.A. Ellison, BSo (UNB), MBA (McM), PhD (Tenn)

H.I. Gessmann, Vordiplom (Stuttgart), MS (Oregon), PhD (UBC)

R.E. Klapstein, BSo (Calg), BA (Alta), MBA, LLB (Dal), LL.M (Osgoode Hall), CMA

S.O. Larsson, BSc (SGW), MSo (Alta), PhD (UBC)

R.N. Maddox, BA, MBA, PhD (Ohio State)

L.W. Mealea, AB, MBA (Rutgers), PhD (Mass)

Andrews Oppong, BSo (Ghana), MBA (Chicago), PhD (Iowa), CGA, (on leave 1993-94)

D.J. Patton, BA (UNB), MA (Tor), DBA (Indiana)

A.C. Peacock, BA, MA, PhD (Western) (on leave 1993-94)

R.S. Sandhu, BSo, BCL, LL.M (Delhi), LL.M (Yale), MBA (Dal) (on leave 1993-94)

E.W. Soott, BComm (Dal), MBA (Col), CA, CMA

Yaghoob Shafai, BSo, MPA (Tehran), MBA, PhD (Mich State) (on leave 1993-94)

D.P.J. Sheridan, CD, BA, BEd, MEd (Admin) (Sask), PhD (Alta)

R.A. Street, BComm, LLB (Dal), MBA (Western), LL.M (Dal)

Assistant Professors

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

J.K. Grude, BA (Alta.), MSo, PhD (London)

B.W. MaoLean, BComm, MBA (Dal), CA
F.S. Skinner, BComm (Memorial), MBA, PhD
(Tor)

Part-Time Faculty

C. Ivey, BComm, MBA (Dal), CMA, FCMA

P. Jefferson, BA, MA (Dal)
J. MacDonald, BCom (Alberta), MBA (Dal)
H. McNutt, MBA (SMU)
B. Moffatt, BA (Acadia), MBA (Dal), CMA
E. Pease, BA, BEd (Dal), MEd (MSV)
D.G. Ross, BBA (Acadia), MBA (Dal), PhD
(Bradford)
D. Trainor, BBA (UPEI), MBA (Dal), CA
G. Tritse, BA (York), CA, CISA
M.F. Whalen, BSc (SMU), MBA (Dal)

Bachelor of Commerce

The School of Business Administration offers the undergraduate Bachelor of Commerce degree, which is a four-year programme. Starting in September 1991, the Bachelor of Commerce was changed to a mandatory co-operative education programme which allows students to combine relevant work experience with academic studies. The schedule for the Bachelor of Commerce Co-op includes seven academic terms (AT) and three work terms (WT), as follows:

Yr/Term	Fall	Winter	Summer
1	AT1	AT2	FREE
2	AT3	WT1	AT4
3	WT2	AT5	WT3
4	AT6	AT7	

Students enrolled before September 1991 will be able to continue the regular Bachelor of Commerce programme. Such students should consult the Calendar for the year they entered the commerce programme. For further information, contact the Director, Academic Programmes, School of Business Administration, 6152 Coburg Road, (902)494-7080.

Both the regular and co-op programmes in Commerce require a broad and general range of studies, including required and elective classes provided by the College of Arts Science. Both programmes also allow students to choose a measure of concentration in a variety of special areas.

The term "Bachelor of Commerce" is used in this Calendar with reference to the programme applicable to students enrolled prior to September 1991. The programme of studies for the Bachelor of Commerce Co-op is the programme described in detail in this calendar.

Courseware Development Project

The School of Business Administration has undertaken a multi-million-dollar project to introduce computers into all aspects of the School. Prime objectives of the project include the integration of information technology into the curriculum and the development of sophisticated decision support systems for practicing managers through research carried out by faculty members in cooperation with industry.

Currently, all faculty members and support staff have their own personal computers and students have access to a computer laboratory with 45 personal computers and 20 terminals. All personal computers and terminals are connected through a data switch to the School's three MicroVAXes and artificial intelligence computer, and are networked with other computer systems on campus providing gateways to international data networks.

The generosity of several Canadian corporations, as well as the support of the Capital Campaign for Dalhousie, has enabled the School of Business Administration to become a recognized world leader in this area.

Programme Guide

The School has developed suggested programmes for the guidance of students in the BComm Co-op who wish to concentrate in a particular area of study. Consult the office of the Director, Academic Programmes.

The professional accounting bodies allow certain exceptions in respect of classes taken in the School of Business Administration. These differ from province to province. Particulars can be obtained from the several provincial offices of the Institute of Chartered Accountants, the Association of Certified General Accountants, the Society of Management Accountants, and the Chartered Institute of Secretaries. In Atlantic Canada, the Atlantic School of Chartered Accountancy provides the pre-qualification education for the CA profession, and can advise which of the classes completed at Dalhousie are accredited for their purposes.

Note: All classes are half-credits except those designated as "R", which are full credits.

Classes Offered

Note: Each of the following A or B classes may be offered only as A or B. Check the current timetable to determine in which term the class is offered. It may not be possible to offer all the electives listed below in every year. Students should bear this in mind when planning their programme for the following year.

COMM 1000A Introduction to Business: This course is designed to introduce the student to the various aspects of business and the areas of study within it, including economic systems, entrepreneurship, marketing, management, accounting, and finance. A wide range of teaching-learning methods are applied, including lectures, seminars, computer simulations, case discussion, and business games. The course prepares the student for the more rigorous treatment of functional topic areas in subsequent courses and establishes a business person's perspective.

Format: lectures 1 1/2 hrs per week, tutorial/seminar 1 1/2 hrs per week

COMM 1101A or B Introductory Accounting I: for Non-Commerce students: An introduction to the principles and practices used by accountants in processing and communicating data both within and outside the entity. Emphasis is on financial statement accounting and reporting, with the following objectives:

- (1) to introduce the theoretical framework upon which financial statement accounting is based, and examine its major underlying principles;
- (2) to examine basic financial accounting methodology, and develop the analytical and procedural skills related thereto;
- (3) to develop an understanding of the information content of conventional financial statements, and an appreciation of the inherent limitations of accounting information.

Format: Regular lecture method: two 90-minute lectures per week, plus a 90-minute weekly tutorial, as required. Selected computer exercises are part of the course, requiring some time to be spent in the Computer Lab.

Exclusion: Credit can be given for only one of Commerce 1101 and Commerce 2101

COMM 1102A or B Introductory Accounting II: for Non-Commerce students: Emphasis is placed on the need for accounting information by managers, with the following objectives: (1) to develop an understanding of the kinds of accounting information managers need; (2) to introduce managerial accounting methodology and develop the analytical and procedural skills related thereto; (3) to introduce accounting reports which are useful for management planning, control and decision-making; (4) to develop an awareness of the limitations of managerial accounting information.

Format: Two 90-minute lectures per week; written and computer-based assignments

Prerequisite: Commerce 1101

Exclusion: Credit can be given for only one of Commerce 1102 and Commerce 2102

COMM 1501A or B Introduction to Computers in Business Management: The goal of this course is to enable students to be immediately productive within an information processing system. Successful completion of this course will provide students with a clear understanding of computers and how they may be incorporated into a business environment, as well as a proficiency with word processing, spreadsheets, databases and a fourth-generation language. The class combines traditional lectures with a completely self-paced, computer-managed, instructional environment, including tutorials, quizzes and electronic mail. It is strongly recommended that students complete this class in their first year of study.

Format: Lectures/computer labs, 3 hours

Exclusions: Computer Science 1000, 1200 and 1400 may not be counted for credit, nor are they eligible as substitutes for Commerce 1501

COMM 2101A or B Introductory Accounting I: for Commerce students: An introduction to the principles and practices used by accountants in processing and communicating data both within and outside the entity. Emphasis is on financial statement accounting and reporting, with the following objectives:

- (1) to introduce the theoretical framework upon which financial statement accounting is based, and examine its major underlying principles;
- (2) to examine basic financial accounting methodology, and develop the analytical and procedural skills related thereto;
- (3) to develop an understanding of the information content of conventional financial statements, and an appreciation of the inherent limitations of accounting information.

Format: Regular lecture method: two 90-minute lectures per week, plus a 90-minute weekly tutorial, as required. Selected computer exercises are part of the course, requiring some time to be spent in the Computer Lab.

Exclusion: Commerce 1101

COMM 2102C Introductory Accounting II: for Commerce students: Emphasis is placed on the need for accounting information by

managers, with the following objectives: (1) to develop an understanding of the kinds of accounting information managers need; (2) to introduce managerial accounting methodology and develop the analytical and procedural skills related thereto; (3) to introduce accounting reports which are useful for management planning, control and decision-making; (4) to develop an awareness of the limitations of managerial accounting information.

Format: Two 90-minute lectures per week; written and computer-based assignments

Prerequisite: Commerce 2101

Exclusion: Commerce 1102

COMM 2110A or B Data Processing

Systems: This class provides a basic understanding of information systems, especially accounting information systems. It builds on material learned in Commerce 1501 dealing with various hardware and software issues not covered in that course. The course emphasizes the topics of systems analysis, design, control and evaluation, and topics related to database systems. In addition, the course involves instruction in, and the use of, various computer programmes such as spreadsheets, databases and wordprocessors.

Format: Ranges from 3 hours of lectures per week to no classroom time, with extensive computer conferencing

Prerequisites: Commerce 1101 or 2101, 1102 or 2102, 1501; computer- and accounting-related work experience often provides an adequate background for this class; see instructors for further information.

COMM 2201A or B Introduction to

Managerial Finance: An introduction to the problems business managers face in the acquisition and effective use of the firm's financial resources, and analytical concepts for evaluating financial decisions. How the firm can achieve successful interaction with its external environment and make an appropriate contribution to the operation of the economy is considered. Topics covered: time value of money; present value; financial ratio analysis; working capital management; and long-term financial decisions.

Format: Lecture 1.5 hours; tutorial 1.5 hours

Prerequisites: Commerce 1000, 1101 or 2101; Economics 1100

Co-requisite: Commerce 1102 or 2102

COMM 2301A or B Organizational Behaviour: Insight into human behaviour in organizations and capacity for objective analysis is

developed. Research and text material drawn from the fields of sociology, anthropology and psychology are used in the development of understanding and objectivity. Case material and substantive data from the behavioural sciences are considered. Covers such major topics as motivation, group behaviour, individual differences, personality, perception, communications, leadership, inter-group behaviour, conflict management, job design, corporate culture, learning and creativity.

Format: lecture 1.5 hours; tutorial 1.5 hours

Prerequisites: Commerce 1000 and 1501, Economics 1100 and one Mathematics at the 1000 level

COMM 2302C Organizational Theory and Design (formerly 3302): Surveys both theory and research pertaining to complex organizations with emphasis on design, structure and administrative practices in the environmental setting and how the interaction of these variables relates to organizational performance. Concomitant with this exposure to theory and research, students have the opportunity to apply this knowledge to case studies relevant to complex organizations. Emphasis is on the analysis of case studies and the formulation of general solutions and decisions for action. Covers such topics as bureaucracy, function-product structures, matrix structure, organizational goal-setting, organizational design and ethics, organizational decision-making, communications, control, management of change and innovation, new corporate designs, computer technology and organizational design.

Format: Lecture 3 hours

Prerequisite: Commerce 2301

Exclusion: Commerce 3302 (former number)

COMM 2401A or B Introduction to

Marketing: The student receives a basic understanding of the character and scope of marketing and its role in business operations and in society, with focus upon the concepts and techniques an organization must employ to anticipate and satisfy consumer needs. Emphasis is placed on the tools available for the marketing manager, the problems to be confronted, and the development of understanding and analytical ability in the following: the role of the consumer; product-line development; channels of distribution; pricing systems; selling and promotional activities. Case materials and problem sets are used to give insight into the analytical tools used in problem analysis and decision-making.

Format: lecture/discussion, 3 hours

Prerequisites: Commerce 1000 and 1501; Economics 1100; and one Mathematics at the 1000 level.

Co-requisite: Commerce 1101 or 2101

Exclusions: students cannot receive credit for both Commerce 2401 and 1401 (as this course was formerly numbered)

COMM 2501A or B Statistics for Business I: An introduction to the principles and applications of statistics relevant to business and economics, with emphasis on making inferences based on observed data. Topics covered include descriptive statistics, probability, random variables, decision theory, estimation, hypothesis testing, statistical software.

Format: Lecture 3 hours

Prerequisite: Commerce 1000 and 1501, Economics 1100 and one Mathematics at the 1000 level

Exclusions: Mathematics 1080, 2080, Statistics 1080, 2080, Economics 2280

COMM 2502C Statistics for Business II: A continuation of Commerce 2501. Topics covered include ANOVA, chi-square, non-parametric regression and correlation, time series, Index numbers, an introduction to the use of statistical packages on the computer, and management uses of statistical data.

Format: Lecture 3 hours

Prerequisites: Commerce 2501 or Mathematics 1080 or 2080, or Statistics 2080, or Economics 2280

Exclusions: Mathematics 2080, Statistics 2080, Economics 2280

COMM 2601A or B Legal Aspects of Business - Contracts: This course provides an appreciation of some of the legal problems that might be faced by the business community. It examines the meaning and sources of law, the machinery of justice, the law of torts, the formation of contracts, capacity to contract, legality of object, mistake, undue influence, duress, misrepresentation, statute of frauds, privity of contracts, interpretation, breach and discharge of contracts, and the law of agency. Students must make extensive use of the law library in writing reports on a series of cases.

Format: Lecture 3 hours

COMM 2602A or B Commercial Transactions: This follow-up to Commerce 2601 examines the law relating to the sale of goods, bailment, contracts of employment, negotiable instruments, real property, tenants and landlords, mortgages, partnerships, corporations, devices for securing credit and

the rights of creditors. Students must make extensive use of the law library in writing reports on a series of cases.

Format: Lecture 3 hours

Prerequisite: Commerce 2801

COMM 2701C Business Communication: The goal of this class is to teach students how to properly prepare both written and oral business communications. The stress will be on written communication, specifically business memos, letters and reports, although communication theories and the role of communication in business will be discussed. As well, one oral presentation per student will be required.

Format: Lecture 3 hours

Prerequisite: English Competency Requirement must be satisfied

COMM 2801B: Work Term one, Bachelor of Commerce Co-op

Prerequisites: successful completion of 7 full credits (14 half credits) including ECO 1100; MATH 1000 and 1010, or MATH 1110 and 1120; COMM 1000; COMM 1501; and COMM 1101.

COMM 3100A Financial Accounting and Investigation: This course is intended for non-accounting students. The approach to the course is analytical rather than procedural, with an emphasis on a user perspective. Topics include an in-depth treatment of liquidity and profitability analysis, pensions, leases, earnings per share, cashflow, accounting for inflation, special industry analysis, and non-profit accounting.

Format: Lecture 3 hours

Prerequisites: Commerce 1101 or 2101, 1102 or 2102

Exclusions: Commerce 2111, 3111, 3113

COMM 3101B Managerial Accounting: The course applies, through a combination of case analysis and problem-solving, managerial accounting concepts to the planning and controlling activities in organizations. Emphasis will be given to non-manufacturing activities. This course is intended for students not concentrating in accounting.

Format: Lecture 3 hours

Prerequisites: Commerce 1101 or 2101, 1102 or 2102, 2201

Exclusions: Commerce 3112

COMM 3111A or B Intermediate Financial Accounting Procedures: This class and its follow-up, Commerce 3113, are meant to provide an understanding of corporate financial reporting and the related conceptual framework. The course develops technical expertise in various financial accounting topics, some of which were introduced in

Commerce 2101 and 2102. The focus is on understanding the implicit inter-relationships in the framework and the environmental factors that work to establish GAAP (generally accepted accounting standards).

Format: Lecture 3 hours

Prerequisites: Commerce 1101 or 2101 and 1102 or 2102 with a B— average, or permission of instructor

Exclusion: Commerce 3100; Commerce 2111 (former number)

COMM 3112A or B Cost Accounting: The purpose of this course is to provide the student with detailed knowledge of cost/managerial accounting concepts and practices which help organizations in their planning, decision-making and control activities. Topics to be covered include product costing systems, cost behaviour analysis and estimation, cost allocation, standard costs and budgeting. The course is intended primarily for students who plan to concentrate their studies in the accounting area. Students who wish to take a course in cost/managerial accounting beyond the introductory level, but do not plan to pursue a career in accounting, should consider taking Commerce 3101 instead of this course.

Format: Lectures/case discussions, 3 hours

Prerequisites: Commerce 1101 or 2101 and 1102 or 2102, with at least a B— average, or permission of the instructor

Exclusions: Commerce 3101; Commerce 2112 (former number)

COMM 3113A or B Intermediate Financial Accounting Theory: This course and its prerequisites, Commerce 3111, are meant to provide an understanding of corporate financial reporting and the related conceptual framework. The course examines the assumptions underlying topics in the external reporting model, and the consequences of relaxing those assumptions in, for instance, the study of Accounting Measurement Models. Quantitative technical skills are emphasized simultaneously with the qualitative factors governing accounting policy choice.

Format: Lecture 3 hours

Prerequisite: Commerce 3111 (formerly 2111), or permission of the instructor

Exclusion: Commerce 3100

COMM 3114A or B External Auditing: This course covers the theory and practice of public auditing according to generally accepted auditing standards (GAAS). The first half of the course considers the forces impacting on the setting of standards and the current level of standards. This part includes

pronouncements of the accounting profession, reporting standards, professional ethics, statute laws, legal liability and responsibilities, standards for examination of internal control in both manual and computerized environments, standards for the quality of evidence, statistical sampling and the sufficiency of evidence, documentation and working papers. The second part of the course considers typical audit programmes for examination of balance sheet and income statement accounts.

Format: Lecture 3 hours

Prerequisites: Commerce 2110, 3111 (formerly 2111)

COMM 3120A or B Information for Organizational Control: The course develops and evaluates in detail management control systems in all types of organizations - profit and not-for-profit, manufacturing and service organizations. Case analysis is used to look at structures such as cost, profit and investment centres. Information requirements of specific control and planning models, such as linear programming, decision theory and forecasting, are also examined.

Format: Lecture/case analysis/problem-solving, 3 hours

Prerequisites: Commerce 3112, 2301, 2502, or permission of instructor

COMM 3201A or B Intermediate Finance: A more intensive study of capital budgeting, cost of capital and valuation theory than that of Commerce 2201. The course is intended to provide an overview of the theory of corporate finance and the application of that theory to the problems faced by a financial manager. Emphasis is on principles of capital budgeting, valuation, investment decisions, financial structure, dividend policy and bargaining for funds vital in financing a business enterprise. Case analysis will be used.

Format: Lecture 3 hours

Prerequisites: Commerce 2201 and one of 3111 (formerly 2111), 3112, 3100 or 3101

COMM 3202A or B Security Analysis: Introduces the theory and philosophies of investment, and concentrates on investment analysis using computers, machine-readable data and other tools available to the institutional investor. The focus is on common stocks, bonds, and investment trusts. Case material is primarily Canadian and covers stocks, bonds, options and mutual funds. Reading assignments and case analysis provide opportunities to handle investment analysis and portfolio management on a problem-solving basis.

Format: Lecture 3 hours

Prerequisites: Commerce 2201, 2502; Economics 2201

COMM 3203A or B Canadian Capital Markets: Canada's capital markets and the flow of funds within them. Main sectors in the capital markets are identified and their historical development and function within the total structure is emphasized. Other areas include term structure and risk structure of interest rates, the risk-return relationship on financial assets and the efficiency of Canada's capital markets. Reading assignments, case analysis, evaluation of available research results and classroom discussion comprise the class.

Format: Lecture 3 hours
Prerequisites: Economics 2201; Commerce 2201. The latter may be waived with the consent of the instructor.

COMM 3210A or B Insurance and Risk Management in the Corporate Setting: Basic concepts of insurance, insurance market organizations, types of insurance and the development of programmes for corporate risk management. Problems of implementation and administration are also considered.

Prerequisites: Comm 2102/2201/2302/2502; ECO 2200 or 2201

COMM 3303A or B The Personnel Function: Covers the major aspects of the personnel function: job analysis, human resource planning, selection, training, performance appraisal, compensation, labour relations, safety and health, and human resource information systems. Knowledge of the processes is supplemented by the development of analytical skill in coping with various personnel problems and in the integration of the processes with the many other functions required in the organization. This "system and process" analysis builds upon the skill and knowledge acquired in Commerce 2301. Cases simulate work environments. The role of personnel management and administration of the personnel function are analyzed.

Format: Lecture 3 hours
Prerequisites: Commerce 2301

COMM 3304A or B Labour - Management Relations: Introduces students to some practical and theoretical aspects of labour-management relations in Canada. Examines historical, legal, behavioural, economic and political background of our system. Emphasis is on the key processes of industrial relations as they impinge on the activities of managers. Cases used are drawn mainly from Canadian sources.

Format: Lecture 3 hours

Prerequisites: COMM2301/2302 or instructor consent

COMM 3305A or B Individual And Organizational Change: Current concepts and methods of individual and organizational change. The primary objective: to develop the student's skills as a change agent and improve performance as a manager, using lectures, exercises and case studies. The opportunity to fine-tune those analytical and decision-making skills necessary for the effective introduction of change into complex organizations, enabling the student to: (1) identify those situations where change is appropriate; (2) develop effective change strategies; (3) implement planned change; and (4) effectively monitor the change process.

Format: Lecture 3 hours
Prerequisites: Commerce 2301 and 2302, or permission of instructor

COMM 3306A or B Interpersonal Dynamics: A more intensive study of the processes and possible problems associated with the dynamic interaction between individuals. Building upon Commerce 2302, such techniques as sensitivity training, structured exercises in interpersonal relations, and case studies are employed.

Format: Lecture 3 hours
Prerequisites: Commerce 2301 and 2302, or permission of instructor

COMM 3307A or B New Venture Creation: This course is about entrepreneurship - the process of creating new businesses. It is designed to expose students to the issues, problems and challenges of creating new businesses and to provide students with the opportunity, within the framework of a formal course, to explore and develop business ideas they have been considering or wish to investigate. Cases are used to permit students to vicariously experience some of the issues entrepreneurs face. Experiential exercises enable the students to better understand themselves, their entrepreneurial potential and the merits of their new venture idea. A major field project requires the development of a detailed business plan for the new venture.

Format: Lecture 3 hours
Prerequisites: COMM 2102/2201/2401, or permission of instructor
Exclusion: Commerce 3308 (before 1991/92)

COMM 3401A or B Buyer Behaviour: In view of the very competitive situation in Western business, the firm that is successful designs and sells products that meet the desires of specific consumer segments. Thus, analysis and prediction of consumer behaviour are increasing in importance and sophistication. An extensive body of research evidence from

marketing and the behavioural sciences is explored and evaluated to assess the marketing implications of elements of consumer behaviour. The emphasis of the class is empirical research on an outside project. The theoretical background for the projects and their progress are discussed in class. Students must do a considerable amount of background reading from the text and outside sources.

Format: Lecture/discussion, 3 hours
Prerequisite: Commerce 2401

COMM 3402A or B Marketing Communications: The communication tools of advertising, sales promotion, and public relations are presented as part of the overall marketing mix. Positioning, segmentation, and other marketing concerns will be studied as they relate to the firm's communications situation. Problems of the promotion manager will be presented to help students appreciate those factors which affect promotional decisions. The completion of a marketing communications plan for an outside organization is required, as is group case work.

Format: Lecture/case method/applied project work, 3 hours
Prerequisites: Commerce 3401

COMM 3404A or B Marketing Research: The scientific method in solving marketing problems. Emphasis on planning and formulating research problems, research design, application of sampling methods, statistical design of experiments, and analysis of data collected. A real-life research project is required, its nature to be determined considering student interests and backgrounds.

Format: Lecture/discussion, 3 hours
Prerequisites: Commerce 2502, 3401

COMM 3405A or B Export Marketing: The course will discuss reasons why Canadian companies get involved in exporting, and will focus on the development of marketing plans for the export of Canadian goods and services. Also discussed will be barriers faced by companies engaging in international trade, and government agencies providing support services to facilitate international transactions.

Format: Lecture/discussion, 3 hours
Prerequisites: Commerce 1102, 2401;
 Economics 1100

Recommended: Commerce 3701

COMM 3406A or B Retailing: Retailing is designed to provide an understanding of the functions, problems and practices of retail management. It provides an exposure to location planning, layout, organizational structure, retail personnel management, buying, pricing, retail accounting and control

mechanisms. A major component of the course is the completion of a strategic plan for a retail business concept.

Format: Lecture/case method/applied project work, 3 hours

Prerequisites: Commerce 2201, 3401, 3410

COMM 3407A or B Logistics Management: An examination of the decision problems faced by the manager of the channels of distribution, the transportation and storage of products, and the communications and data processing system, in order to minimize the total cost of these activities and satisfy the marketing requirements of the firm and its customers. Topics include: the integrated logistics management concept, customer service, transportation, distribution centres, inventory management, materials management, packaging, purchasing, order processing and information systems, financial control, logistics organization, international logistics, reverse distribution and recycling, and the strategic logistics plan.

Prerequisites: Commerce 3410 and 3501, or permission of the instructor

COMM 3408A or B Transportation Modes and Policy: This course examines the development and operation of various transportation modes and national transportation policy in Canada. Topics include the characteristics, cost structures and pricing decisions of the various modes (air, pipeline, rail, road and water); the National Transportation Act and other relevant legislation; the structure of the industry and government agencies; regulation; subsidies, passenger transportation and tourism, urban and metropolitan transportation; traffic and carrier management; transportation and environmental issues; current and emerging freight and passenger issues (with particular reference to the role of transportation in the Atlantic Region).

Format: Lecture/discussion/seminar, 3 hours

Corequisite: Commerce 3410, or permission of the instructor

COMM 3409A or B Sales Management: This course is designed to provide an understanding of the tasks and problems facing today's sales manager and to familiarize one with current sales force management practices. Specifically, this class provides an exposure to the concepts, techniques and procedures in buyer-seller relations, salesmanship, organization of the sales force, personnel management, selection, sales training, motivation, compensation, evaluation and supervision, budgets, quotas, territories and sales control. Extensive use is made of the case method,

and classroom discussion is used to extend the basic text material and examine other points of view.

Format: Lecture/case method/field work, 3 hours

Prerequisites: Commerce 2401

Co-requisites: Commerce 2201, 2301, 3101

Exclusion: Commerce 2402 (as this class was formerly numbered)

COMM 3410A or B Channels of Distribution:

Few companies deal with their final customers directly, most relying on a network of distribution channel intermediaries to get their products to market. This requires that producers carefully design, select and manage their distribution channel operations to achieve the desired level of performance. This course reviews theory and practice in this field of management, employing case analysis and projects to enhance student learning.

Format: Lecture/discussion, 3 hours

Prerequisites: Commerce 1102 or 2102, 2401, 2201, 2301

Exclusions: prior to 1988/89, this class was numbered Commerce 2401. Credit will be given for only one of Commerce 2401 (taken prior to 1988/89) and Commerce 2403 (taken after 1987/88) and Commerce 3410 (taken after 1992/93)

COMM 3501A or B Production/Operations Management: "Production" is one of the basic functions of any organization, whether it provides goods or services. Consequently, all managers, whatever their specialist interests, should have an understanding of some of the key concerns in managing operations, particularly if they aspire towards senior/general management positions. The purpose of this course is to provide such an understanding. It begins at a basic level by examining various types of production processes and continues by considering key aspects of scheduling, control, materials management and quality assurance. It concludes by examining production planning and strategy.

Format: Two 1.5-hour lectures (or case discussions)

Prerequisites: Commerce 2201, 2301, 2401, 2501

COMM 3601A or B The Law of Business Associations:

Modern business operating through various forms of associations, in particular the corporation, raises complex problems: (a) the choice of the form of business enterprise; (b) the nature of the corporate personality; (c) the dual system of incorporation; (d) the corporate constitution; (e) the contracts between the corporation and outsiders; (f) the control and

management of a corporation; (g) the capital structure of a corporation in the raising and maintenance of capital; (h) the securities legislation; and (i) organic changes in a corporation through mergers, amalgamations, sale of assets, take-overs, reorganization, receivership and winding up. Improved understanding of the complexities of the field, while providing indispensable minimal skills essential in reaching well-formulated decisions, is the objective.

Format: Lecture 3 hours

Prerequisites: Commerce 2601, 2602

COMM 3602A or B The Consumer and the Regulation of Business: Complexities in the relationships between the consumer, business and government continue to increase. A rapidly expanding body of law designed to regulate these relationships in an effort to promote freedom of contract has developed. Of particular concern are problems relating to quality and safety of goods and services, warranties and guarantees, misleading advertising, unfair trade practices, the regulation of consumer credit, and legal remedies. Some of the more critical problems, the legal remedies available, and the role of administrative tribunals, their jurisdiction, and their procedures and policies are examined.

Format: Lecture 3 hours

Prerequisites: Commerce 2601, 2602

COMM 3701A or B The Firm in the International Environment: As an introduction to international business, this course examines the principal methods of doing business abroad and the dimensions of the international business environment that are important to each. Successful exporting calls for an understanding of, among others, international trade flows, national trade policies, international financial flows and foreign exchange movements. Accordingly, selected aspects of the theories of international trade and finance are presented, as well as the origins and current operations of major international institutions - the GATT, IMF and World Bank Group. Regional trading areas and international commodity arrangements are also covered. The course also treats the theory of the multinational enterprise, along with methods for analyzing the economic, political and social dimensions of host countries.

Prerequisites: Commerce 2102, 2201; Economics 2200 or 2201

COMM 3801A: Work term two, Bachelor of Commerce Co-op

Prerequisites: Commerce 2801 and successful completion of 9 full credits (18 half credits)

COMM 3802: Work term three (May - August), Bachelor of Commerce Co-op

Prerequisites: Commerce 3801 and successful completion of 11 full credits (22 half credits)

COMM 4101A or B Advanced Topics In Accounting I: This course covers advanced concepts in accounting. Topics include non-profit accounting, current pronouncements, special industry accounting, valuation, capital market and information efficiency, estates and trusts, bankruptcy, as well as an in-depth review of certain topics treated in prerequisite courses.

Format: Lecture 3 hours
Prerequisites: Commerce 3111, 3112 and 3114, or permission of the instructor

COMM 4102A or B Advanced Topics In Accounting II: This class has two objectives: (1) to provide an in-depth study of the interrelated topics of intercorporate investments, business combinations, consolidated financial statements and foreign operations, and (2) to develop a framework that may help to resolve controversial issues in advanced financial accounting.

Format: Lecture 3 hours; extensive use is made of assigned cases and problems
Prerequisites: Commerce 3111 and 3113, or permission of the instructor

COMM 4107A or B International Accounting: Accounting practices in various countries are studied for both internal and external accounting and reporting problems. Foreign currency translation methods for Canadian companies operating in other countries are also reviewed.

Format: Lecture 2 or 3 hours, depending on the instructor and his/her emphasis on research as a supplement to didactic lecturing
Prerequisites: Commerce 3113, 3120

COMM 4113A or B Contemporary Issues In Accounting: Current issues in accounting and recent accounting literature are examined to provide a familiarity with the direction of accounting developments, and as a basis for future study of accounting problems and practices. Difficulties with present practices are explored, along with proposed alternatives.

Format: Seminar 2 or 3 hours, depending on the instructor's emphasis and on enrolment
Prerequisite: Commerce 3113

Recommended: Accounting concentration

COMM 4114B Computer Auditing: This class examines the special considerations when auditing in a computerized environment.

Three major areas covered in the class are:

(1) Special internal control techniques/requirements and standards for examination of internal control. This includes standards for acquisition, development, implementation, conversion, testing and maintenance of systems, concentrating on the goal of ensuring that good internal control is attained. The course also covers the standards associated with computerized processing of transactions, creation and control over databases, and special planning for interruption of computer operations and re-start. (2) Audit procedures in a computerized environment. For each special internal control technique, there exist a number of possible audit procedures. Audit strategy is considered, including auditing around the system, reliance on and examination of computerized controls, and use of computer-assisted audit techniques. (3) Use of computer-assisted audit techniques, including use in the course of "Interactive Data Extraction and Analysis", a software package from the CICA, developed by the Auditor General of Canada.

Format: Lecture 2 hours; lab 1 hour
Prerequisites: Commerce 2110, 3114

COMM 4120A or B Taxation: An introduction to the taxation system in Canada, with special reference to the provisions of the Income Tax Act (federal) and their effects on business decisions. The measurement processes used to determine the tax base are examined, and the basic elements in the calculation of tax payable for individuals and corporations are discussed.

Format: Two 90-minute lecture sessions, with significant effort directed to the solving of short case problems

Prerequisites: Commerce 1101 or 2101; Economics 1100

Exclusions: Taxation I in the Law School, if taken recently

COMM 4121A or B Advanced Taxation: (Not offered every year.) A more detailed examination of the corporate taxation system in Canada. Some examples of how tax awareness and planning can be a significant element in the regular business decision-making process for both individuals and corporations, and especially for private corporations.

Format: Lecture 3 hours per week for part of the term; the remainder consists of seminar presentations of researched topics by students

Prerequisites: Commerce 4120

Recommended: should be taken in the student's senior year

COMM 4150B Research In Accounting: This class provides the opportunity for students to undertake both directed and independent study of selected topics in accounting, and requires a major research paper. This class is available to Honours students only.

Format: Research seminar 3 hours
Prerequisites: Commerce 4113, and an average grade of at least B+ in Commerce 3113, one of Commerce 3111 or 3112, one of Commerce 2110 or 3114, one of Commerce 2201 or 3201, one of Commerce 2602 or 2302, and Commerce 2502

Recommended: All Honours requirements met or currently being completed

COMM 4200R Seminar In Finance: Special seminar restricted to Honours students in Finance. Students are exposed to aspects of financial theory not covered in other classes. Each student prepares an original Honours thesis.

Prerequisites: an average of B+ in Commerce 2201, 2502, 3201, either 3202 or 3203, and Economics 2200 or 2201

COMM 4201A or B International Financial Management: This course focuses on the financial management of the individual firm in the international market place. Topics include the financial goals of multinational enterprises (MNEs), foreign exchange management, international money markets, financing foreign trade, international capital budgeting, and managing the MNE system.

Prerequisites: Commerce 1102 or 2102, 2201, 2502, 3701; Economics 2200 or 2201

COMM 4300R Seminar In Management: Special seminar restricted to Honours students in Management.

Prerequisites: Commerce 3305 or one-half credit in Psychology at the 2000 level and a B+ average in Commerce 2301, 2502, 2302, 3303, 3304; Economics 2200 or 2220

COMM 4350R Strategic Management: This is the capstone course of the Commerce programme. It is about general management - the practice of business from the perspective of the general manager. As such, it integrates the concepts and techniques developed in earlier courses. The principal tool of the general manager is strategy, so the primary course concern is the formulation and implementation of strategy. Other issues addressed include: business ethics and the role of personal values in strategy, business-government relations, and managing strategic change. The course exposes

students to a wide variety of organizations and contexts through cases, and includes a major field project where students, in small groups, study and advise actual businesses.

Format: Lecture 3 hours
Prerequisites: Commerce 2102, 1501, 2201, 2301, 2401, 2302, and 3501; Economics 1100

COMM 4401A or B Marketing Strategy: This course is intended for marketing majors who wish to deepen their understanding of how marketing strategy is formulated and implemented. This involves high-level, long time-frame decisions, since the product and market strategies are at issue. The course aims to improve decision-making skills in managing product/market portfolios and implementing marketing strategies. As a capstone course, it is designed to permit the integration of learning from other marketing courses, as well as those in finance, policy and management. Instruction is mostly through case study discussions, report writing, and group presentations.

Format: Seminar 3 hours
Prerequisites: COMM 2401/3401/3404 (or 3408 if transportation major) & 1 other marketing course (3410 - formerly 2403 - recommended)

Recommended: Concentration in marketing

COMM 4402A or B Independent Study In Marketing: The content of this class is negotiated with an individual instructor. The class offers the student the opportunity to explore in greater detail any particular area of interest in marketing.

Format: Directed readings and discussions
Prerequisites: Commerce 2401, 3404, and two other half classes in marketing

COMM 4403A or B Special Topics In Marketing: A special interest seminar for senior level marketing students. The particular topics to be discussed are at the discretion of the instructor. Interested students should consult the School.

Format: Lecture/discussion/seminar, 3 hours
Prerequisites: Commerce 2401, 3401
Exclusion: Commerce 3403 (former number)

COMM 4413A Advanced Topics In Marketing: This class carries students beyond the basic tools of Marketing, developing an understanding and appreciation of the value of theory in Marketing. (This is a required class for Honours students in Marketing.)

Format: Discussion/seminar, 3 hours

Prerequisites: Commerce 2401, 3401, 3404, and at least one-half other class in Marketing at the 3000 or 4000 level

Prerequisites: Mathematics at the 1000 level; Commerce 1501 and 2502, or consent of instructor

COMM 4450B Honours Thesis in Marketing: Students write an Honours thesis demonstrating their ability to gather, analyze, and synthesize data leading to new knowledge useful in understanding Marketing. Special seminar restricted to Honours students in Marketing.

Format: Seminar 3 hours

Prerequisites: Commerce 4413A; an average grade of B+ in all Marketing classes beyond Commerce 2401

Co-requisites: Commerce 4401B must be taken concurrently

COMM 4501A or B Operations Research: The goal of this course is an understanding of the major O.R. techniques and how to apply them, not their theoretical development. Topics included are: linear programming formulation, simplex method, sensitivity, integer variables, transportation, dynamic programming, queuing, simulation. Cases are used to illustrate the main topics, L.P. and simulation.

Format: Two 1.5- hour lectures

Prerequisites: Commerce 1501 and 2502, or permission of the instructor

COMM 4534A or B Managing Technological Entrepreneurship: High technology based industries face unique management problems imposed by the rapid rate of technological change and the often uncertain environmental impacts of technological innovations. This class examines some of the techniques that have recently been developed to improve management effectiveness in high technology organizations and their responsiveness to environmental concerns.

Prerequisites: all required core area classes, except Commerce 4350, or consent of instructor

COMM 4538A or B Applied Multivariate Analysis: The convenience of packaged statistical programmes (e.g., SPSS) has opened the area of data analysis to researchers with a wide variety of backgrounds. Since it is possible to operate "canned" programmes without understanding advanced mathematics, there is a need for a class designed around a packaged statistical programme (SPSS) that introduces the user to the basic concepts underlying the techniques. An introductory class in multivariate analysis for students in business and economics. Students use and interpret statistical programmes with data sets from such business areas as marketing, finance and organizational behaviour.

Canadian Studies Programme

Location: Multidisciplinary House, 1444 Seymour Street, Halifax, N.S.
Telephone: (902) 494-3814
Fax: (902) 494-2178

Coordinator

J.A. Wainwright - (494-3814/3384)

Faculty

R. Apostle (Sociology and Social Anthropology)
 B. Bednarek (French)
 M. Bradfield (Economics)
 D. Cameron (Political Science)
 D. Clairmont (Sociology and Social Anthropology)
 M. Cross (History)
 C. Denyak (History)
 J. Elliott (Sociology and Social Anthropology)
 R. Finbow (Political Science)
 B. Leaser (Economics)
 P. Monk (English)
 J. Gore (French)
 H. Runte (French)
 J. Smith (Political Science)
 G. Taylor (History)
 A. Wainwright (English)

Aim

The purpose of the programme is to allow students to concentrate part of their work on Canadian Studies both within their major field and outside of it. For example, a student who is planning to major in a subject will take a number of classes in that subject that are designated as Canadian. The student will in addition take a number of classes that are designated as Canadian outside his or her major field.

In other words, the Canadian Studies Programme does not attempt to establish a new major field. It seeks to use any one of a number of departments in the Faculty of Arts and Social Sciences as a base around which a student may effectively cluster a number of classes in Canadian subjects. However, all students in the Canadian Studies programme must take the half-credit interdisciplinary seminar, CANA 2000A or B. Students in this seminar will consider significant issues in Canadian history, politics, society, and literature and their interrelated contribution to this country's past, present, and future. Those who fulfil the Canadian-content requirements of this programme will have the words "With An Emphasis in Canadian Studies" on their transcript upon graduation.

Classes

Before enrolling in any of the classes listed below, students should consult with the Coordinator of Canadian Studies in the Multidisciplinary House.

In addition to the disciplines and classes listed below, there are individual Canadian content classes available from the Departments of Comparative Religion and Music, and from the School of Education. Please consult with the appropriate Chair.

Students who are interested in a Canadian Studies programme should attempt in their first year to take an introductory class in the following subjects: English, French, History (preferably HIST 1200R if available), and in either Political Science or Sociology and Social Anthropology. (Prospective Economics majors may substitute an introductory class here).

With attention to prerequisite classes, in the second, third, and possibly fourth years of study, students, either as part of, or in addition to, fulfilling their major discipline requirements, should take:

- One or more classes in English from the list below;
- One or more classes in French from the list below, including FREN 2021A/FREN 2022B (Études pratiques/Practice in Language Skills - please consult the Department for appropriate section);
- One or more classes in History from the list below;
- One or more classes in either Political Science or Sociology and Social Anthropology from the lists below (again, an Economics major may substitute an upper-level class here).

NOTE: Classes marked * are not offered every year. Please consult the current timetable on registration to determine if these classes are offered.

CANA 2000 A or B Distinct Societies - A Seminar in Canadian Studies: An interdisciplinary seminar for second, third, and fourth year students in the Faculty of Arts and Social Sciences who, in pursuit of their degree in a particular subject, are taking one or more Canadian-content classes in English, History, and French, as well as one or more Canadian-content classes in Political Science OR Sociology and Social Anthropology OR Economics. This seminar will be taught by a number of professors in various Faculty of Arts and Social Sciences disciplines. In individual weekly seminars students will consider essays and other short readings in English, History, French (in translation), Political Science, Sociology and Social Anthropology, and Philosophy. The class is designed to provide students with the

opportunity to consider the structure and content of Canadian society from a variety of academic viewpoints - philosophical, historical, political, sociological, and literary.

Instructors: Wainwright, Taylor, Cross, Danysk, Apostle, Elliott, Bednarski, Oore, Runte, Burns

Format: Seminar/Discussion

Co-requisite: Canadian-content classes in English, History, French, and Political Science or Sociology and Social Anthropology or Economics

Enrolment: Limited to 5-10 students

English Classes Cross-listed With Canadian Studies

*ENGL 2207R Canadian Literature

*ENGL 4357R Honours Seminar in Canadian Literature

French Classes Cross-listed With Canadian Studies

FREN 2021A/FREN 2022B Études pratiques/Practice in Language Skills

FREN 2203A or B Approches du texte littéraire/Approaches to Literary Texts

*FREN 3025A or B Les Parlers acadiens: Introduction linguistique/Linguistic Introduction to Acadian Dialectology

*FREN 3900A/FREN 3901B La Littérature canadienne-française/French Canadian Literature

*FREN 3910A or B Études acadiennes/Acadian Studies

*FREN 4902A Écrivains Québécois Contemporains/Contemporary Quebec Writers

*FREN 4904A or B Écrivaines Québécoises/Quebec Women Writers

History Classes Cross-listed With Canadian Studies

HIST 1200R History of Canada

*HIST 2202A or B Canada's Industrial Revolution, 1850-1950

HIST 2211A or B Social History of Canada Before 1870

HIST 2212A or B Social History of Canada Since 1870

HIST 2221A or B Rough Justice: Canadian Popular Culture to the 1890's

HIST 2222A or B Rough Justice: Canadian Popular Culture, 1890's to Present

HIST 2230R Canada in the 20th Century

HIST 2270R The Atlantic Provinces

*HIST 2334A or B The United States, Canada, and the World

*HIST 3220A or B Youth Culture in Canada, 1950's to 1970's

*HIST 3222A or B Topics in Canadian Social History, 19th and 20th Centuries

*HIST 3225A or B Crime, Punishment and the Criminal Law in Canadian Society

*HIST 3230A or B Labour and Community in 19th Century Canada

*HIST 3231A or B The Canadian Working Class: The 20th Century Experience

*HIST 3245A or B French Canada

*HIST 3250A or B Canada Within the Empire

*HIST 3255A or B The Age of MacDonald and Laurier

*HIST 3260A or B West by North: History of the Canadian West and North

*HIST 3261A or B The Rural Experience in Canada

*HIST 3272A or B Themes in the History of Atlantic Canada

HIST 3273A or B Nova Scotia: Pre-Confederation

HIST 3274A or B Nova Scotia: Post-Confederation

*HIST 3286A or B The Urban Experience in Canada

*HIST 3292A or B Wealth and Power in North America

*HIST 3302A or B Technology and History in North America

*HIST 3610A or B Women in Capitalist Society: The North American Experience
Cross-listed in Women's Studies as *WOST 3305A or B.

*HIST 3750A or B History of Seafaring

Please Note: 3000-level classes have prerequisites which apply to Canadian Studies students as well as History majors.

Political Science Classes Cross-listed With Canadian Studies

POL 2200R Canadian Government and Politics

*POL 2228A or B Government and Business Relations

*POL 3205A or B Canadian Political Thought

POL 3216A or B Local and Regional Government

POL 3220A or B Intergovernmental Relationships in Canada

-POL 3224A or B Canadian Political Parties

*POL 3228A or B Interest Groups: Function and Management

*POL 3235A or B Regional Political Economy in Canada

*POL 3245A or B The Judicial System and Canadian Government

*POL 3250A or B Canadian Public Administration

POL 4204R Advanced Seminar in Canadian Government

POL 4240A or B Policy Formulation in Canada

POL 4241A or B Introduction to Policy Analysis

Social Anthropology Classes

Cross-listed With Canadian Studies

*SOSA 2110R Canadian Society

Please note that this class is not offered every year. However, there are numerous Canadian content classes in the Department. Students should consult with the Chair and then with the Coordinator of Canadian Studies.

Economics Classes Cross-listed With Canadian Studies

ECON 2232R Canadian Economic History

ECON 3316B Collective Bargaining and Labour Market Policy

*ECON 3317B Poverty and Inequality

ECON 3324R Public Finance

*ECON 3326A Money and Banking

ECON 3332A or B Resource Economics

*ECON 3336B Regional Development

*ECON 3432R Regional Economics

*ECON 4000R Seminar on Economic Policy (not usually offered)

*ECON 4426B Monetary Policy

*ECON 4433B Intergovernmental Fiscal Relations

Other Economics classes that deal with Canadian issues are available. Students should consult with the Chair and with the Coordinator of Canadian Studies.

Chemistry

Location: Chemistry Building
 Telephone: (902) 494-3305
 Fax: (902) 494-1310

Chairperson of Department
 R.J. Boyd

Faculty Undergraduate Advisors

T.S. Cameron (494-3759)
 T.P. Forrest (494-3315)
 J.S. Grosseert (494-3314)
 R.D. Guy (494-7079)
 P.G. Kueailk (494-3827)
 J.A. Pincock (494-3324)
 L. Ramaley - Chair (494-7078)
 R.E. Waaylishen (494-2564)

Emeritus Professors

O. Knop, DSc (Laval), Harry Shirreff Professor
 of Chemical Research
 D.E. Ryan, BSc (UNB), MA (Tor), PhD, DSc
 (Lond), DIC

Professors

D.R. Arnold, BS (Bethany College), PhD
 (Roch), Alexander McLeod Professor of
 Chemistry
 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,
 SoD (Cantab), President, Dalhousie University
 J.A. Coxon, MA (Cantab), MSc, PhD (East
 Anglia)
 T.P. Forrest, BSc (MtA), MSc (Dal), PhD
 (UNB)
 J.S. Grosseert, BSc, MSc, PhD (Natal)
 J.C.T. Kwak, BSc, MSc, PhD (Amsterdam)
 K.T. Leffek, BSc, PhD (Lond)
 P.D. Pacey, BSc (McG), PhD (Tor)
 J.A. Pincock, BSc, MSc (Man), PhD (Toronto)
 L. Ramaley, BA (Col), MA, PhD (Prin)
 R. Stephens, MA (Cantab.), MSc (Bristol),
 PhD (London), DIC
 R.E. Waaylishen, BSc (Wat), MSc, PhD (Man)
 M.A. White, BSc (Western), PhD (McM)

Associate Professors

N. Burford, BSc (Wales), PhD (Calgary)
 T.B. Grindley, BSc, MSc, PhD (Queen's)
 K.R. Grundy, BSc, MSc Hons, PhD (Auckland)
 R.D. Guy, BSc (SFU), PhD (Carl)
 D.L. Hooper, BSc, MSc, PhD (UNB)
 C.H. Warren, BSc (Western), PhD (McM)

Assistant Professors

P.G. Kueailk, BSc (Lethbridge), MSc, PhD
 (UBC), (NSERC University Research Fellow)

P.D. Wentzell BSc (Dal), PhD (Mich State)
 R.L. White BSc (Dal), PhD (McM)

Visiting Scientists (1992)

N. Forowghifar, Arak University, Iran
 Xavier Lopez, University of the Basque
 Country, Spain
 Russell G. Ross, University of East Anglia,
 United Kingdom/ University of Umea, Sweden
 J. Valkonen, University of Jyväskylä, Finland

Senior Instructors

C.D. Burkholder, BSc (Wat)
 C.M. Byers, BSc Hons (Dal)
 J. Gabor, MSc (Budapest)
 S.A. Sawler, BSc (MSVU), BEd (Dal), MBA
 (Dal)
 D.J. Silvert, MSc (CWRU)
 W.D. Tacreiter, MSc (Krakow)
 K.E. Thompson, BSc (Acadia), MBA (SMU)
 M.E. Warren, BSc (Western)

Adjunct Professors (1992)

R.K. Boyd, National Research Council,
 Institute for Marine Biosciences
 A.J. Thekkar, UNB, BSc, PhD (Queen's)
 K. Vaughan, St. Mary's, BSc (UMIST), PhD
 (St. Andrew's)
 M. Zaworotko, St. Mary's, BSc (London),
 PhD (Alabama)

**Postdoctoral Fellows and Research
 Associates/Assistants (1992)**

G. Bednarz, MSc (Łódź), PhD (Dal)
 R. Cordes, BSc (Dal), MSc (UBC)
 X. Du, PhD (Dal)
 K. Elohele, PhD (University of Tübingen,
 Germany)
 L.A. Erikson, PhD (Uppsala, Sweden)
 H. Furue, BSc (Inter. Christ Univ., Japan),
 MSc (Osaka Univ., Japan), PhD (Queen's)
 W. Kwiatkowski, PhD (Technical University
 of Łódź, Poland)
 Y.G. Lee, PhD (Chungnam National
 University, Korea)
 M. Li (Qinghai Inst. of Salt Lake Chinese
 Academy of Science)
 M. Mandy, PhD (Tor)
 K.C. Manthorne, BSc (Dal), BSc Eng (TUNS)
 S. Mason, PhD (Leicester)
 I. McLennan, PhD (Guelph)
 K. McManus, PhD (Dal)
 R. Rao, BSc (Andhra, India), PhD (IIT,
 Bombay, India)
 Z. Shi, BSc (Shandong), PhD (Dal)
 I. Svishchev, PhD (Moscow)

Introduction

Chemistry is one of the fundamental sciences. It explores the interactions among different forms of matter and energy. Its main purpose is to gain a basic - but also a very useful - understanding of how compounds react and when and why they form particular

products. The universe and the world in which we live are composed of chemicals. Therefore, chemical knowledge helps us to influence and protect our environment; chemical principles and procedures are found everywhere in the groundwork of the natural and medical sciences.

The Honours BSc is the expected professional requirement for a chemist. Chemists with honours degrees are employed in widely differing areas in industry and government. This degree will provide a background for further graduate work in chemistry or in such diverse areas as medicine, law, business administration, biochemistry, oceanography and geology. A postgraduate degree is essential for independent original research in an industrial career or in university teaching.

Chemistry 1010 (or 1020 or 1040 or 1500) is an introduction to the discipline. All students intending to take classes in chemistry beyond the first-year level should include classes in mathematics and physics in their first year. Final grades in these classes should not be less than C; if they are, the student is bound to find advanced classes in chemistry difficult and frustrating.

At the second-year level the student is exposed to the four traditional areas of specialization in chemistry. Inorganic chemistry deals with all the chemical elements except carbon, and the compounds which these elements form. Organic chemistry is devoted to the study of the almost limitless number of compounds containing carbon. Analytical chemistry is concerned with the determination of the composition of substances, and with the detection of elements in quantities however minute. Physical chemistry is concerned with both macroscopic phenomena, including why and at what rates chemical reactions occur, and with molecular phenomena through the application of spectroscopic techniques. Beyond the second-year level, a student's studies in chemistry become increasingly concentrated in one of these four areas. The student may also be introduced to biochemistry or the chemistry of living organisms, as well as such specialties as structural chemistry, radiochemistry, environmental chemistry and theoretical chemistry.

Degree Programmes

The Honours in Chemistry, Joint Honours in Chemistry and Biochemistry and Advanced Major in Chemistry as described in this calendar, are programmes accredited by the Canadian Society for Chemistry (CSC). CSC accreditation ensures that graduates of these programmes have met certain criteria

concerning the quantity and quality of their instruction and qualifies such graduates for membership in the CSC.

Honours in Chemistry

This programme is intended to provide a broad training in chemistry while at the same time making provision for the individual interests of students. Competence in mathematics as well as chemistry is required. All honours students must consult annually with an Honours Student Advisor and obtain approval of their course selection.

All nine required chemistry credits must be passed with a grade of at least C.

Honours Programme

The following Chemistry classes beyond first year must be completed by all honours students: CHEM 2101A or B, 2201A or B, 2301A, 2302B, 2400R, 3101A or B, or 3102B or A, 3201A, 3301A, 3302B and 3401B. In addition, all honours students must complete MATH 1000A, 1010B and 2000R (or equivalent) and PHYS 1100R.

The remaining seven half credits in Chemistry must be chosen from the classes listed below, with at least one half credit from each of the groups A, B, C and D.

- A: CHEM 3101A or B, or 3102B OR A (whichever was not taken earlier), 4101A or B, 4102B or A
- B: CHEM 3202B, 4201A or B, 4202A or B, 4203A or B.
- C: CHEM 3303A, 4301B, 4304A, 4305B, 4306A or B, 4307B
- D: CHEM 3402A, 3403B, 4401A, 4402B, 4403A
- E: CHEM 3501B, 4501A or B, 4502A or B, 4503A or B, 4504B

In order to ensure that the honours requirements can be completed within the usual four year period, students are urged to follow the program outlined below.

- Year 1: CHEM 1010R or preferably CHEM 1500R (or equivalent); Mathematics 1000A and 1010B, Physics 1100R, an approved writing class, and one elective
- Year 2: CHEM 2101A or B, 2201A or B, 2301A, 2302B and 2400R; Mathematics 2000R or 2480A/2490B or 2500R; and one elective
- Year 3: CHEM 3101A or B, or 3102B or A, 3201A, 3301A, 3302B, 3401B plus at least one other chemistry half credit from one of Group A, B, C, D or E; and two electives
- Year 4: The remaining six half credits in chemistry from Groups A, B, C, D and E; and two electives. In addition, the non-credit classes CHEM 3880, 4880, and 8880 (21st or honours credit) must be taken.

Two credits beyond the 1000 level must be taken in a minor subject. Minor subjects allowed for this degree are biochemistry, biology, computing science, earth sciences, mathematics, or physics. The minor, the unspecified credits in chemistry, and electives should be chosen according to the future plans of the student.

Combined Honours Programme

The department has designed a number of programmes which allow a student to obtain a Combined Honours Degree in Chemistry with one of Biochemistry, Biology, Computing Science, Earth Sciences, Mathematics or Physics. To obtain an introduction to all the basic areas of chemistry, CHEM 2101A or B, 2201A or B, 2301A, 2302B and 2400R must be part of any combined honours programme involving Chemistry, and must be passed with a grade of at least C.

The additional eight credits in chemistry and the other subject must be chosen in consultation with the two departments involved. Students must consult an Honours Student Advisor of the Department of Chemistry and the Chair of the other area of study before registering in the combined programme. Interested students should also consult the Department's Handbook "Undergraduate Studies in Chemistry" for more information.

Advanced Major in Chemistry

In order to obtain a general background in Chemistry, the student, after taking CHEM 1010R or 1020R or 1040R or 1500R, must include in his/her programme the classes 2101A or B, 2201A or B, 2301A, 2302B, 2400R, 3101A or B OR 3102A or B, and 3201A as part of the required minimum 7 credits in chemistry beyond first year. These required classes give exposure to the four areas of specialization in chemistry.

Of the classes remaining to satisfy the minimum requirements in Chemistry, at least one half class should be chosen from 3301A, 3302B and 3401B depending on the student's major interests. Advanced Major students in their fourth or higher year of study can also elect to be involved in a literature or experimental project, CHEM 4801A, B or C. Each student who plans to major in chemistry should consult with a Chemistry Counsellor each year regarding a programme of study. The student's programme must also include Mathematics 1000A, 1010B, and 2000 (or equivalent) and Physics 1100R (or equivalent).

All chemistry classes to be counted towards the Advanced Major in chemistry must be passed with a grade of C- or better.

Advanced Double Major Programme

The Department has a number of programmes which allow a student to obtain an Advanced Double Major Degree in Chemistry with one of Biochemistry, Biology, Computing Science, Earth Sciences, Mathematics or Physics. To obtain an introduction to all the basic areas of chemistry, CHEM 2101A or B, 2201A or B, 2301A, 2302B and 2400R must be part of any advanced double major programme involving Chemistry, and must be passed with a grade of at least C-.

Additional credits in Chemistry and the other subject must be chosen in consultation with the two departments involved. Students are encouraged to consult an academic advisor of the Department of Chemistry and the Chair of the other area of study before registering in the programme. Interested students should also consult the Department's Handbook "Undergraduate Studies in Chemistry" for more information.

Major in Chemistry

After taking CHEM 1010R or 1020R or 1040R or 1500R, a student must include in his/her programme the following Chemistry classes: 2101A or B, 2201A or B, 2301A, 2302B, and 2400R. These required classes give exposure to the four areas of specialization in Chemistry. Physics 1300 or 1100 and Math 1000 and 1010 are required. The remaining single Chemistry credit (minimum) beyond the first year can be taken from any of the 3000 or 4000 level Chemistry classes. Notwithstanding the Faculty regulation that two credits in the major must be at the 3000 or 4000 level, in Chemistry three credits must be at the 2000 level with one credit (minimum) at the 3000 or 4000 level. Note that CHEM 4801A, B, or C is not available in the Chemistry Major Programme.

All chemistry classes to be counted towards the Major in chemistry must be passed with a grade of C- or better.

Classes Offered

A or B indicates that the class is a half credit and is offered in either the A or B term or in exceptional circumstances in both terms. C indicates a half credit class extending over both the fall and winter terms. An asterisk (*) indicates that the class is not necessarily offered every year. Consult the timetable for up-to-date details.

Early registration for classes is strongly encouraged. In recent years certain classes, particularly CHEM 1010R, 1500R, 2101A or B, 2201A or B and 2400R have reached

maximum possible enrolment long before completion of the final registration period in September.

Students who have passed a first-year Chemistry class with a grade of D should consider themselves inadequately prepared for further studies in this subject. Such students may not be allowed to register directly for second-year Chemistry classes but may request that their names be put on a waiting list. Consult the Department for details. Duly registered students, who do not show up for the first two scheduled lectures in a class, may lose their place to students on the waiting list.

Chemistry Resource Centres

First-Year and Advanced Resource Centres are located in Rooms 122 and 115. The former is staffed with people who can help with Chemistry problems. Facilities include study areas, a computer laboratory with special programmes designed for Chemistry students, molecular models, audio-visual aids and a small library.

CHEM 1000R The Chemical World: This class is intended for students who want to take only a first-year credit in science, and who wish to understand some of the chemical aspects of the world around us. The class does not use a mathematical approach to science, and can be taken by students with no, or limited, previous chemistry experience. The class will cover the development of chemical knowledge from early times to the present. By means of lectures, frequent (and sometimes spectacular!) demonstrations, and laboratory or reading projects, students will be introduced to the world of chemistry and to chemicals and chemical ideas in everyday use. Students contemplating careers, e.g., in law, business, or government could profit from the material studied in this class. Students will be required to do extensive written assignments, which will be marked both on content and writing style. CHEM 1000R is an approved "writing class" in the College of Arts and Science. CHEM 1000R does not serve as a prerequisite for second-year chemistry classes.

Instructor: T.S. Cameron
Format: lectures 2 hours, lab/tutorial 2 hours

Exclusions: CHEM 1000R cannot be taken concurrently with or after CHEM 1010R, 1020R, 1040R and 1500R

Enrolment: limited.

CHEM 1010R General Chemistry: A study of the fundamental principles of chemistry with particular reference to stoichiometry, atomic and molecular structure, gases, liquids and

solids, solutions, thermochemistry, equilibria, chemical properties of common substances, acid-base and oxidation-reduction reactions and chemical kinetics. Students enrolling in this class should have a background in chemistry equivalent to the Nova Scotia XII level. Mature students should consult the Department. It is important that students be familiar with exponents and logarithms, and be able to solve quadratic and simultaneous equations.

Instructors: A. Chatt, T.B. Grindley, K.R. Grundy, P.G. Kusalik, R. Stephens, C.H. Warren

Format: lectures 3 hrs, tutorial 1 hr, lab 2 hrs

Any of CHEM 1010R, 1020R, 1040R or 1500R may serve as a prerequisite for any 2000 level class in chemistry, and as a credit in the College of Arts and Science. However, credit will only be given for one of 1010, 1020, 1040 or 1500.

CHEM 1020R General Chemistry for Engineering Students: This class is similar to Chem 1010, but with greater emphasis on quantitative topics, including chemical equilibrium, thermodynamics, reaction kinetics and electrochemistry. The class is open only to students enrolled in the Engineering programme, but it serves also as a regular prerequisite for all second-year chemistry classes.

Instructors: J.A. Coxon, R.E. Wasylshen
Format: lectures 3 hours, tutorial 1 hour, lab 2 hours

CHEM 1040R General Chemistry for the Life and Health Sciences: The basic content and rigour of this class is the same as that of CHEM 1010. However, more emphasis is given to organic (as opposed to inorganic) structures, and topics that are of interest to the life and health sciences are favoured over those of the inanimate variety. Thus, chemical principles are illustrated primarily by examples from living systems. Some additional topics such as enzyme kinetics, ionizing radiation, and several types of bio-analyses are introduced in short and simple form. CHEM 1040 uses the same textbook and laboratory experiments as CHEM 1010 and serves as a regular prerequisite for all second-year Chemistry classes.

Instructor: W.A. Aue
Format: lectures 3 hours, tutorial 1 hour, lab 2 hours

CHEM 1410A Introductory Chemistry: A descriptive introduction to chemistry with emphasis on materials related to the life and health sciences. The class requires a background of high school chemistry and mathematics. Topics covered include units, matter, the Periodic Table, stoichiometry of

reactions, gases, liquids, solids, solutions, simple concepts of equilibria, acids, bases, radioactivity hydrocarbons, alcohols, ethers, amines, amides, esters and simple carbohydrates and proteins. The organic chemistry deals primarily with structures and introduces molecules of medicinal interest.

Instructor: P.D. Pacey
Format: lectures 3 hours, tutorial 2 hours

Note: This class does not serve as a prerequisite for any other chemistry class.

CHEM 1430R Introductory Chemistry and Biochemistry: This class combines CHEM 1410A and Biochemistry 1420B for use by Nursing students. It does not qualify as a prerequisite for any other classes in Chemistry or Biochemistry.

CHEM 1500R Principles of Chemistry (formerly 1030R): Similar to CHEM 1010 but with more emphasis on atomic and molecular structure, thermodynamics, equilibria and kinetics. This class is intended for prospective science students and for students wishing to gain a more thorough introduction to the principles of chemistry. Students enrolling in this class must have attained high standing in high school chemistry and are advised to contact the lecturer prior to registering for this class. Concurrent enrolment in Mathematics 1000 and 1010, or in Mathematics 1500 is advised.

Instructors: R.J. Boyd, N. Burford
Format: lectures 3 hours, lab/tutorial 3 hours
Enrolment: limited

CHEM 2101A or B Introductory Inorganic Chemistry: The fundamentals of inorganic chemistry are covered. Specific topics include: ionic bonding and the nature of solids, the structure of atoms and simple bonding theory, coordination chemistry of the transition metals and selected topics in main group chemistry. The preparation, analysis and observation of inorganic compounds are the laboratory assignments.

Instructor: T.S. Cameron
Format: lectures 3 hours, lab 3 hours
Prerequisite: CHEM 1010 or 1020 or 1040 or 1500(1030)

CHEM 2201A or B Introductory Analytical Chemistry: An introduction to those analytical techniques most often employed in modern chemical analysis. Topics include: acid-base and redox chemistry and the theory of titrations based on these types of reactions; atomic and molecular spectroscopy in the visible and ultraviolet regions of the electromagnetic spectrum; potentiometry and the use of ion selective electrodes; and gas and liquid chromatography. Laboratory

experiments will be based on topics selected from the lectures and will introduce the student to a wide variety of methods.

Instructors: P.D. Wentzell
Format: lectures 3 hours, lab 3 hours
Prerequisite: CHEM 1010 or 1020 or 1040 or 1500(1030)

CHEM 2301A Chemical Thermodynamics: The physical chemist attempts to describe macroscopic systems and chemical reactivity based on an understanding of the atoms and molecules which make up the systems we study. This first class in physical chemistry will start with a discussion of the forces between molecules, and the properties of gases, liquids and solids. Energy relations in macroscopic systems are presented; further topics in thermodynamics include thermochemistry, entropy, and free energy relations, with many applications including phase equilibria, chemical equilibrium, solutions and colligative properties. In the laboratory students will perform experiments based on many of the concepts discussed in class, including an introduction to data handling by computer.

Instructor: M.A. White
Format: lectures 3 hours, lab 3 hours
Prerequisites: CHEM 1010 or 1020 or 1040 or 1500(1130), Mathematics 1000 and 1010

CHEM 2302B Chemical Kinetics and Dynamics: This class examines the dynamics of systems by considering motion and reactivity of molecules. Topics include transport properties such as diffusion and ionic conductivity, the molecular kinetic theory of gases, and rates of chemical reactions. The latter are studied in detail, with applications in atmospheric chemistry, liquid and solid state reactivity, catalysis, enzyme kinetics and polymers. The laboratory experiments emphasize the determination of molecular motion and chemical reactivity using a variety of techniques and instrumental methods.

Instructor: J.C.T. Kwak
Format: lecture 3 hours, lab 3 hours
Prerequisites: CHEM 1010 or 1020 or 1040 or 1500(1130), Mathematics 1000

***CHEM 2303B or A Physical Chemistry for the Life Sciences:** Chemistry majors may not apply credit for CHEM 2303 towards the major requirements for a degree in Chemistry. Those who do not plan a career in chemistry, but who can use the principles and concepts of physical chemistry in related areas, are introduced to the basic ideas of physical chemistry with the necessary mathematical concepts in simple terms. Previous knowledge of calculus is not necessary. The principal topics: thermodynamics, rates of

enzyme-catalyzed reactions, chemical equilibrium and spectroscopy are treated by application to examples of biological and environmental interest.

Instructor: P.G. Kusalik
Format: lectures 3 hours, lab/tutorial 3 hours

Prerequisite: CHEM 1010 or 1020 or 1040 or 1500(1130)

Exclusions: Credit will not be given for both of CHEM 2301 and CHEM 2303 or for both of CHEM 2302 and CHEM 2303

CHEM 2400R Introductory Organic

Chemistry: This class gives a broad introduction to the chemistry of carbon compounds, including molecular shapes and bonding, characteristic reactions of functional groups and the way in which they take place, and the application of spectroscopy to organic chemistry. Laboratory work is designed to teach a broad range of fundamental operations and techniques used in modern organic chemistry laboratories. Students should have a good comprehension of the principles studied in CHEM 1010 (1100) or equivalent, as evidenced by a grade of at least C.

Instructors: D.R. Arnold, J.S. Grosseart, T.P. Forrest, and J.A. Pincock

Format: lecture 3 hours, lab 3 hours

Prerequisite: CHEM 1010 or 1020 or 1040 or 1500(1130)

SCI 3000R Science Fundamentals: An interdisciplinary class that stresses the motivations, methodologies, and responsibilities of scientists, and provides extensive formal instruction in written and oral communication of scientific material. For details, see main calendar entry "Science, Interdisciplinary." The status of this class (elective, minor, or major credit) varies from department to department; check with your undergraduate advisor.

CHEM 3101A or B Chemistry of the Main

Group Elements: This class gives an overview of the chemistry of the non-metal elements (p block), with particular emphasis on the elements of the second (B - F) and third rows (Al - Cl). Preparative methods, molecular structure, characterization, and bonding are discussed, with some examples examined in detail. The laboratory introduces synthetic procedures for the preparation of inorganic compounds and some study of their reactions. Some of these experiments involve special techniques, such as vacuum line manipulation and high temperature.

Instructor: N. Burford

Format: lecture 3 hours, lab 3 hours

Prerequisite: CHEM 2101

CHEM 3102A or B Coordination Chemistry of the Transition Metals: Modern bonding theories are used to unify discussion of the chemical and physical properties of compounds of the transition elements. The laboratory experiments introduce procedures for the preparation and characterization of compounds of the transition elements. The compounds prepared illustrate the principles discussed in class and exhibit unusual structures, geometries, oxidation states and other interesting properties.

Instructor: K.R. Grundy

Format: lecture 2 hours, tutorial 1 hour, lab 3 hours

Prerequisite: CHEM 2101

CHEM 3201A Analytical Spectroscopy and

Separations: The most commonly employed instrumental techniques in chemical analysis use spectroscopy in some form or involve separations. Qualitative and quantitative analysis and the instrumentation involved are discussed in some detail for spectroscopic methods in the visible, ultraviolet, and X-ray regions of the spectrum. Various methods of separation including precipitation, solvent extraction, and the various types of chromatography are presented. Laboratory experiments illustrate the above techniques with practical examples.

Instructor: R.D. Guy

Format: lecture 3 hours, lab 3 hours

Prerequisite: CHEM 2201

CHEM 3202B Instrumental Methods of

Analysis: This class deals with the application of various important instrumental and computer techniques to problems in chemical analysis. These techniques include electrochemistry, radiochemistry, mass spectrometry, sampling theory, electrophoresis, data analysis and automation. Basic chemical, physical and mathematical principles are explained, instrumentation is described and analytical applications are examined. Laboratory experiments are designed to illustrate the techniques covered in the lectures.

Instructor: P.D. Wentzell

Format: lecture 3 hours, lab 3 hours

Prerequisite: CHEM 3201 or Instructor's consent

CHEM 3301A Quantum Mechanics and

Chemical Bonding: This class gives an introduction to quantum mechanics and its application to spectroscopy and the electronic structure of atoms and molecules. The postulates of quantum mechanics are presented and applied to some simple physical systems, followed by a discussion of the rotations and vibrations of molecules, and the electronic structure of atoms, concluding

with an introduction to the simple Hückel molecular orbital method. The relevance to chemical bonding will be stressed.

Instructor: C.H. Warren

Format: lectures 3 hours

Prerequisite: Mathematics 2000 or 2490B and CHEM 2101 or 2301 or 2302

CHEM 3302B Symmetry and Spectroscopy:

Many different types of electromagnetic radiation, such as ordinary visible light, microwave radiation, and X-rays, are absorbed and emitted by all atoms and molecules. The understanding and uses of such phenomena constitute the subject of spectroscopy. Spectroscopic methods are used extensively in all areas of chemistry and a wide range of applications have been developed. In recent years, the traditional approaches have been complemented by dramatic development of newer techniques, such as magnetic resonance and laser spectroscopies. This class provides an introduction to the physical basis and applications of most types of spectroscopy, including microwave, infrared, visible, ultraviolet, laser, Raman, and magnetic resonance techniques. The topics of molecular symmetry and elementary group theory are introduced at an early stage, and provide a satisfying and unifying thread extending over all areas of spectroscopy.

Instructor: J.A. Coxon

Format: lecture 3 hours, lab 3 hours

Prerequisite: CHEM 3301 or permission of the instructor

CHEM 3303A Materials Science: The emphasis of this class will be on the exposition of the underlying principles involved in understanding physical properties of materials, such as thermal and mechanical stability, and electrical and optical properties. All phases of matter will be examined: gases, liquids, films, liquid crystals, perfect crystals, defective solids, glasses. The principles of important processes such as photography and Xerography will be explained.

Instructor: M. A. White

Format: lecture 3 hours

Prerequisite: CHEM 2301 or Physics 3200A or Earth Sciences 2100R or Engineering 2340A or permission of the instructor.

CHEM 3401B Intermediate Organic Chemistry: This class is a continuation of CHEM 2400 and covers many of the topics included in the last third of modern organic chemistry texts. Topics presented include enolate anions, amines, aromatics, heterocycles, carbohydrates, amino acids, and concerted reactions. The synthesis of compounds of chemical and pharmaceutical

interest will be used as a focus for these topics. In addition, an introduction to some of the principles of mechanistic organic chemistry will be presented. Students work independently in the laboratory on the preparation of organic compounds. The success of student syntheses is monitored by the use of spectroscopic and other techniques. Students should have a good comprehension of the principles studied in CHEM 2400R, as evidenced by a grade of at least C.

Instructor: J.A. Pincock

Format: lecture 3 hours, lab 3 hours

Prerequisite: CHEM 2400R (or equivalent)

CHEM 3402A Identification of Organic Compounds: The class develops separation techniques, together with wet chemical and spectroscopic analysis methods, that were introduced in CHEM 2400. Spectral techniques studied include ultraviolet, infrared, Raman, proton and carbon nmr, and mass spectrometry. Students, using a variety of techniques, work independently in the laboratory to identify unknown substances and to separate and identify components of mixtures. Students should have a good comprehension of the principles studied in CHEM 2400R, as evidenced by a grade of at least C.

Instructor: J.S. Grossert

Format: lecture 3 hours, lab 3 hours

Prerequisite: CHEM 2400 (or equivalent)

CHEM 3403B Bioorganic Chemistry: The principles of organic chemistry that are used by the organic chemist to explain and predict the reactivity of compounds will be used to study the behaviour of organic compounds in nature. To cause a reaction to occur in the laboratory it might be necessary to alter functional groups and provide other conditions necessary to induce particular reactivity. In a natural system the same principles can be considered in the analysis of the reactivity of the organic compounds involved. The basic principles controlling the reactivity of organic compounds will be reviewed and applied to a study of selected naturally occurring reaction pathways.

Instructor: R.L. White

Format: lecture 3 hours

Prerequisite: CHEM 2400 or equivalent

CHEM 3501B Numerical Methods in Chemistry: This class provides an introduction to numerical methods that can be applied to various problems in chemistry. Students will utilize these techniques on microcomputers. Topics to be covered include the treatment of experimental data by least squares methods; by curve fitting, smoothing, and interpolation techniques; and by numerical integration. Matrices, determinants, and eigenvalue equations will

be studied and applied to problems in quantum chemistry and spectroscopy. Complex equilibria will be examined through the numerical solution of simultaneous equations. Computer graphics will be introduced and applied to topics such as wave functions, gas laws, potential energy contours, coordinate transformations and molecular geometries. Computer simulation of experiments will also be examined.

Instructor: C.H. Warren
Format: lecture 3 hours
Prerequisites: CHEM 2301 and 2302 and Mathematics 2000 or 2480A and 2480B or instructor's consent

CHEM 3580 General Topics In Chemistry: A non-credit seminar class to be given by invited speakers. Attendance at all seminars is required of all 3rd year Honours Chemistry students.

***CHEM 4101A or B Topics In Non-Metal Chemistry:** Following a brief overview of the fundamental aspects of preparation, structure and bonding for familiar systems, selected topics are examined in some detail. An emphasis is placed on novel structure and bonding arrangements in comparison with carbon chemistry and other common systems.

Instructor: N. Burford.
Format: lectures 3 hours
Prerequisite: CHEM 3101

***CHEM 4102B/A Advanced Transition Metal Chemistry:** Organotransition metal chemistry has grown over the last several decades into one of the most important areas of research and development in inorganic chemistry. In this class the most important types of organic ligands and their bonding characteristics will be surveyed, as will the most important reaction pathways such as migratory insertion, oxidative addition, nucleophilic addition, etc. The class concludes by examining homogeneous catalysis by organotransition metal complexes. The lab consists of several projects in which the principal reaction pathways are explored and the important characterization techniques are employed.

Instructor: K.R. Grundy
Format: lecture 2 hours, lab 3 hours
Prerequisite: CHEM 3102 or instructor's consent

***CHEM 4201A or B Advanced Topics In Separations:** Chemistry started as the science of separations and separations are still its most prominent feature in most laboratories around the world. This class will deal mainly with chromatography and associated techniques; in particular, gas chromatography in its regular, capillary and supercritical forms, high-pressure liquid (including ion) chromatographies, capillary

electrophoresis, and gas and liquid chromatography combined with other instrumental techniques such as mass spectrometry. The original ideas behind the design of separation media and detection modes will be emphasized, and so will be their consequences for the analysis of living and environmental systems. This class will not present a survey of the field; rather, it will focus primarily on past (and future) innovation. Please consult the instructor for the detailed content of this class in a given year.

Instructor: W.A. Aue
Format: lecture 2 hours, lab arranged
Prerequisite: CHEM 3201, or instructor's consent

***CHEM 4202A or B Topics In Advanced Analytical Spectroscopy:** The topics covered are applicable to elemental analysis: atomic absorption, emission, fluorescence; optical rotation; X-ray spectroscopy; neutron activation analysis. The class will cover the theory and application of the different spectroscopic methods, and will include discussion on instrument design and performance. The emphasis on different topics may vary from year to year; students are advised to consult with the instructor for further detail.

Instructor: R. Stephens
Format: lecture 2 hours, lab arranged
Prerequisite: CHEM 3201

***CHEM 4203A or B Environmental Chemistry:** The first part of this class covers the chemical equilibria suitable for the description of metal ion and organic chemical interactions in the environment. Topics to be covered in this section include polyprotic acid equilibria in sufficient depth to describe carbonate and hydrogen sulphide systems (acidity, alkalinity, conservative quantities), redox equilibria (Eh-pH diagrams), solubility of oxides, hydroxides and carbonates and complexation equilibria. Adsorption equilibria are covered for metal ion and organic interactions with clays, humic and hydrous oxide materials. The second part of the class covers analytical methodology for the determination of metals and organics in environmental systems. Particular interest is paid to analytical methods for the speciation of compounds in waters and sediments. Students should be familiar with or interested in using microcomputers for chemical calculations.

Instructor: R.D. Guy
Format: lecture 3 hours, lab arranged
Prerequisite: CHEM 3201

CHEM 4301B Theory of Chemical Bonding: This class discusses chemical bonding within the framework of molecular quantum mechanics, the science relating molecular

properties to the motions and interactions of electrons and nuclei. The emphasis is on the qualitative features and physical basis of molecular orbital theory and its application to chemistry. The symmetry properties of molecular orbitals are discussed within the context of group theory. Other topics include ladder operators and the addition of angular momenta.

Instructor: R.J. Boyd
Format: lecture 2 hours
Prerequisite: CHEM 3301 or instructor's consent

***CHEM 4304A Kinetics and Catalysis:** This class relates the properties of molecules in motion to the rates of chemical changes. Collision, transition state and diffusion theories are applied to significant industrial, biological and atmospheric processes. Photochemistry, and its converse, luminescence, are interpreted. Mechanisms of catalyst activity are discussed. The laboratory experiments use sophisticated techniques, including computerized data acquisition.

Instructor: P.D. Pacey
Format: lecture 2 hours, lab 3 hours, alternate weeks

Prerequisite: CHEM 2302 or equivalent

***CHEM 4305B Introductory Statistical Thermodynamics:** The principles of statistical mechanics are introduced and the relationship between the laws of thermodynamics and the underlying microscopic processes is examined. Wherever possible applications to chemical systems are emphasized. An overview of modern techniques is also given.

Instructor: P.G. Kusalk
Format: lecture 3 hours
Prerequisites: CHEM 2301 and 3301, or instructor's consent

***CHEM 4306A or B Magnetic Resonance:** The basic principles of magnetic resonance will be discussed and reinforced with examples of applications to problems in chemistry and chemical physics. Topics to be discussed include: the magnetic Hamiltonian, chemical shielding, nmr in solids, quantum mechanical approach to spectral analysis of nmr spectra in liquids, use of organic radicals, relaxation, molecular rate processes, and two dimensional nmr. Students will be assigned problems on a regular basis.

Instructor: R.E. Wasyliehn
Format: lectures 2 hours
Prerequisite: CHEM 3301 or instructor's consent

***CHEM 4307A or B Biophysical Chemistry:** This class gives a theoretical and practical introduction necessary for the application of physical chemistry to life sciences and medicine. Topics include the structure and

conformation of biological macromolecules, techniques for the study of biological structure and function, transport processes and biochemical spectroscopy. The laboratory is on an open basis with at least four experiments to be completed during the term.

Instructor: Staff
Format: Lectures 2 hours, lab 3 hours, alternate weeks
Prerequisite: CHEM 2301 and 2302 and CHEM 3301 and 3302 or instructor's consent

CHEM 4401A or B Synthesis in Organic Chemistry: The prerequisite classes provide a foundation of knowledge of many organic reactions that are useful for bringing about specific functional group transformations. This class expands this foundation and shows how these reactions can be combined in well planned, multi-step strategies to synthesize complex molecules. The thought processes involved are illustrated with examples chosen from recently reported syntheses of natural and unnatural products.

Instructor: T.B. Grindley
Format: lectures 3 hours
Prerequisites: CHEM 3401 and 3402 or equivalents, or instructor's consent

CHEM 4402A, B, or C Organic Structure Determination: This class continues the study of molecular structure and conformation begun in CHEM 3402A, using methods and results from infrared and nuclear magnetic resonance, and mass spectrometry.

Instructor: D.L. Hooper
Format: lecture 3 hours, lab as needed
Prerequisite: CHEM 3402

CHEM 4403A or B Organic Reaction Mechanisms: The fundamental concepts of bonding, structure, and dynamic behaviour of organic compounds are discussed. The applications of molecular orbital theory and molecular mechanics calculations are introduced. Methods for determining the mechanisms of organic reactions are discussed. Topics considered include applications of kinetic data, linear free energy relationships and acid and base catalysis, concerted reactions and the importance of orbital symmetry, steric effects, solvent effects, and isotope effects.

Instructors: D.R. Arnold and J.A. Pincock
Format: lecture 3 hours
Prerequisites: CHEM 3401 and 3402 or equivalents, or instructor's consent

***CHEM 4501A or B Electronic Instrumentation for Scientists:** This class starts with basic electrical concepts and describes simple ac and dc circuits.

Semiconductors are introduced, followed by a discussion of power supplies and the various types of amplifiers. Chemical instruments are used as examples whenever possible.

Practical aspects of electronics such as basic measurements, the use of various electronic instruments, reading circuit diagrams and troubleshooting are emphasized. No knowledge of physics beyond the first year is required.

Instructor: L. Ramaley
Format: lecture 2 hours, lab 3 hours
Prerequisite: CHEM 2201

CHEM 4502A or B Polymer Science: This class will cover aspects of synthesis, analysis, characterization, structure and application of synthetic and naturally occurring macromolecules. Emphasis will be on the application of standard methods of organic synthesis, analytical separations, and physico-chemical characterization. There is no laboratory, but students will do an independent literature project.

Instructor: J.S. Grossert, J.C.T. Kwak, R.E. Wasylehen
Format: lecture 3 hours
Prerequisites: CHEM 2201 and 2301 and 2302 and 2400 or instructor's consent

CHEM 4503A or B Group Theory in Chemistry: The theory of abstract groups and their representations, crystallographic and non-crystallographic point groups, and an introduction to space groups are given. Examples from stereochemistry,

crystallography and spectroscopy illustrate the theory.

Instructor: Staff
Format: lecture 3 hours
Prerequisite: CHEM 3302

CHEM 4504A or B Diffraction Techniques in Solid State Chemistry: All chemical elements and compounds can exist as crystalline solids. This class will study the arrangements of atoms and molecules in such solids and will examine the methods used to determine these structures. Particular emphasis will be placed on the techniques of X-ray crystallography.

Instructor: T. S. Cameron
Format: lecture 2 hours, lab 3 hours
Prerequisites: CHEM 2101 and Math 2000 or 2200 or equivalent

CHEM 4801A, B, or C Advanced Major Research Project: This class is designed for those students in the Advanced Major programme that wish to participate in original research. It will consist of a literature or experimental research project on some aspect of chemistry in which the student has an interest. The results of the research will be embedded in a report which shall be graded.

Coordinator: T.S. Cameron

CHEM 4880 Advanced Topics in Chemistry: A non-credit seminar class to be given by invited speakers. Attendance at all seminars is required of all 4th year Honours Chemistry students.

CHEM 8880 Honours Qualifying Examination: This is an additional class required of all Honours students in Chemistry in order to satisfy regulation 1.3.5, pg. 96. It should be taken in the final year of a concentrated chemistry honours programme. All honours students, whether in a concentrated or unconcentrated programme, must consult with the professor in charge of the Honours Thesis Programme.

Coordinator: T.S. Cameron

Classics

Location: 1244 LeMarchant Street,
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Chair

J.P. Atherton (494-3468)

Undergraduate Advisor

C.J. Starnes (494-3468)

Professors Emeritus

A.H. Armstrong, MA (Cantab), FBA
J.A. Doull, BA (Dal), MA (Tor)

Professors

J.P. Atherton, MA (Oxon.), PhD (Liverpool)
R.D. Crouse, BA (Yind), STB (Harv), MTh
(Trin), PhD (Harv), DD (Trin)
R. Friedrich, Dr.phil. (Goettingen)
C.J. Starnes, BA (Bishop's), STB (Harv), MA
(McG), PhD (Dal)

Associate Professors

W.J. Hankey, BA (Yind), MA (Tor), DPhil
(Oxon)
D.K. House, MA (Dal), PhD (Liverpool)
P.F. Kusmaul, Dr.phil (Basle), Dr.phil.habil.
(Heidelberg)

Introduction

Classics is the study of origins - how the Christian-European tradition arose out of the ancient civilizations of the Mediterranean area. The fundamental ideas and beliefs of Europeans and North Americans, by which they are distinguished from Chinese, Indians, and those of other traditions, were formed in the meeting of Greek and Oriental cultures in ancient times. To understand fully contemporary Western culture, we must study its historical origins. The Department of Classics actively encourages students of all backgrounds and traditions to participate in the study of the classical heritage.

Such an understanding of the unique aspects of Western culture is most important in the contemporary world where all cultures have come into relation with one another.

Classics is the study of the intellectual forces that have shaped our civilization, and to understand fully the assumptions and ideas of that civilization we have to go back to their original formulation. Our literary forms, the shape of our political and social institutions, such disciplines as Philosophy,

History, and many of the Natural Sciences all originated and took shape in the ancient cultures of Greece and Rome.

Classics is thus more than the study of ancient languages. Languages are not learned for themselves, but because they are necessary for the scientific study of ancient history, literature, religion, mythology and philosophy. The Classics Department at Dalhousie provides instruction both in these subjects and in ancient languages. While previous preparation in one or more ancient languages is desirable, it is nevertheless quite feasible for a student who discovers an interest in classics to begin his language studies at university.

Students of classics must learn Greek and Latin if they wish to take an honours degree or to go on to graduate studies in the field, but the Department offers a variety of classes in Greek and Roman Literature, Ancient and Medieval Philosophy, Ancient and Christian Religion, and general Classical Culture, which do not require a foreign language.

Classics is worth studying for its own sake by students who wish to obtain a better understanding of the common assumptions and beliefs of Western society. This knowledge has always been regarded as pertinent to a career in politics and the higher levels of the civil service. For those who are thinking of the clergy, Classics is the most relevant preparation. Classical studies also prepare students for a life of teaching and scholarship in several directions. Canada is responsible for its own culture, and we have great need of scholars and teachers who know about our origins. Classics is also the best preparation for the study of non-European cultures (Chinese, Indian, Islamic, etc.), and there is a growing need for specialists in these fields. For the older history of philosophy, and for the history of Christian belief until, and including, the Reformation, a knowledge of Classics is indispensable. The same may be said for Medieval Studies. Classics leads also to ancient Near Eastern Studies (Jewish, Babylonian, Egyptian, etc.) and to Archeology.

Degree Programmes

Honours Programmes

The candidate may choose between three programmes: BA with Honours in Classics (Ancient Literature), BA with Honours in Classics (Ancient History), or BA with Honours in Classics (Ancient Philosophy). In each case, it is highly desirable, but not essential, that the student begin the study of at least one of the classical languages during the first year of study. For purposes of

meeting grouping requirements, some Ancient and Medieval Philosophy classes may be counted either as Classics credits, or Philosophy credits.

- To receive an Honours degree in Classics:
- Students must complete nine to eleven classes in Classics beyond the 1000 level chosen in accord with the general Faculty regulations for Honours.
- The programme must include work in either Greek or Latin Language and Literature to the 3000 level and work in the other language to an appropriate level as determined by the Undergraduate Advisor.
- The programme must be approved by the Undergraduate Advisor.
- Students must take the Honours Seminar and pass the Honours examination.

Whether the Honours degree is awarded in Ancient Literature, History or Philosophy depends on the area of the Department's offerings in which a larger part of the work is done.

Candidates for Honours and Combined Honours degrees who anticipate continuing their studies at the Graduate level in Classics should consult the calendars of the Graduate Schools of their choice concerning requirements for entry into Graduate programmes. It may be the case that additional preparation in the classical languages or in other aspects of ancient civilizations is required for entry into certain programmes.

Combined Honours

Classics may be taken as part of a combined honours programme with other disciplines. Students interested in such programmes should consult with the undergraduate advisors of the respective departments.

20 Credit Advanced Major

The department offers an advanced major. For further information refer to specific regulations for this programme on page 97. The Department normally requires students to take at least two language classes (in Greek and/or Latin).

BA and BSc

Of classes offered by the department, CLAS 1000R, CLAS 1010R, CLAS 1020R, CLAS 1030R and CLAS 1100R and those classes in Ancient History and Religions, and Ancient and Medieval Philosophy not having a Language prerequisite should be especially useful to students taking a bachelor's degree. All classes beyond the 1000 level are available for major and minor programs in

Classics. The Department is glad to assist students in working out programmes according to their interests.

Note: The following classes satisfy the first-year writing requirements for a degree: CLAS 1000R; CLAS 1010R; CLAS 1100R.

The programmes of all students majoring or honouring in the Department must be approved by the Undergraduate Advisor.

Classes Offered

Note: Classes marked * are not offered every year. It is advisable to inquire at the Classics Department (494-3468) to determine if these classes are offered.

Note: The Introductory classes, and the more elementary classes in Ancient History and Religions, and Classical Philosophy listed below do not require knowledge of the ancient languages. However, students who plan to do advanced work in any of these areas are advised to begin study of the appropriate languages as early as possible.

CLAS 1000R Classical Literature: An introduction to classical civilization by way of the literature, read in English translations. Authors studied are Homer, the Greek Dramatists, Plato, Vergil and St. Augustine. This class meets the first year writing requirement.

Instructors: W. Hankey/R. Friedrich/R. D. Crouse/C. J. Starnes and others.

Format: Lecture 2 hours

Enrolment: 100 including Classics 2000R

CLAS 1010R Ancient History: An Introduction to the Cultural History of the Ancient World: The first term is devoted to a study of the major pre-classical civilizations (Sumer, Egypt, etc.) with attention paid to the art, religion and social forms of these cultures as well as their political development. In the second term the civilizations of Greece, Rome, and Israel are studied, and their issue in the Early Christian world considered. As the class is intended as an introductory one, no special preparation is expected. There is no foreign language requirement. This class fulfills the first year writing requirement.

Instructor: D. K. House

Format: Lecture 2 hours

Enrolment: Limited

***Class 1021A Ancient Art: Greece and the Ancient Near East:** Aided by slides and films, in addition to lectures and readings, this class will study the origin and development of ancient art in Greece, Mesopotamia and Egypt to the end of the Hellenistic period.

Instructor: G. Thomas (this is given at St. Mary's University)

Format: Lecture 3 hours
 Enrolment: 50

***CLAS 1022B Ancient Art: Rome and Christian Europe:** Aided by slides and films, in addition to lectures and readings, this class will study the art of Ancient Rome after the Hellenistic period and of the Christian world to the end of the 14th century.

Instructor: W. J. Hankey
 Format: Lecture 3 hours
 Enrolment: 50

CLAS 1100R Classical Mythology: Why has the mythology of the world of classical Greece and Rome been so central a part of the artistic, intellectual and religious culture of the Western world? This course explains the origin, meaning and importance of classical mythology. During the first term, work begins with a survey of pre-classical mythology: this is explored through myths of the origin and creation of the natural world; here the early cultures of the Sumerians, the Egyptians and the Jews are studied. After a historical lecture on the origins of Indo-European mythology, attention turns to the world of Mycenaean and Early Classical Greece; the works of Hesiod, and the myths of Prometheus are particularly closely considered in this section.

In the New Year the understanding of the human world (community & family) through myth is the principal pre-occupation; here the Iliad of Homer, the Aeneid of Virgil (for the Romans) and the Oedipus plays of Sophocles are the texts through which the mythological consciousness is analysed. The course concludes with a consideration of why the Greeks broke away from the world of myth and began to understand nature and human culture through science and philosophy. This class fulfils the first year writing requirement.

Instructor: J. P. Atherton
 Format: Lecture 2 hours
 Enrolment: 200 including Classics 2100R

CLAS 1700R Introductory Greek: An introduction to Classical Greek. Greek is a highly inflected language and as such presents English-speaking students with a number of challenges not found in most modern languages. This class introduces the student in a systematic way to the most common and important elements of Classical Greek grammar. The aim of the class is to bring the student by the end of the year to read connected passages from Xenophon and other Greek prose writers.

Instructor: Staff
 Format: Lecture 3 hours
 Enrolment: 50

CLAS 1800R Introductory Latin: An introduction to Latin through the study of its

basic grammar. The aim of the class is to enable students to read Latin texts with the assistance of nothing more than a Dictionary.

Instructor: C. J. Starnes
 Format: Lecture 3 hours
 Enrolment: 75

CLAS 2000R Classical Literature: An introduction to classical civilization by way of the literature, read in English translations. Authors studied are Homer, the Greek Dramatists, Plato, Vergil and St. Augustine. This class is the same as CLAS 1000R and may therefore not be taken by anyone who has taken that class.

Instructors: W. Hankey/R. Friedrich/R. D. Crouse/C. J. Starnes and others.

Format: Lecture 3 hours
 Enrolment: 100 including Classics 1000R

CLAS 2100R Classical Mythology: Why has the mythology of the world of classical Greece and Rome been so central a part of the artistic, intellectual and religious culture of the Western world? This course explains the origin, meaning and importance of classical mythology. During the first term, work begins with a survey of pre-classical mythology: this is explored through myths of the origin and creation of the natural world; here the early cultures of the Sumerians, the Egyptians and the Jews are studied. After a historical lecture on the origins of Indo-European mythology, attention turns to the world of Mycenaean and Early Classical Greece; the works of Hesiod, and the myths of Prometheus are particularly closely considered in this section.

In the New Year the understanding of the human world (community & family) through myth is the principal pre-occupation; here the Iliad of Homer, the Aeneid of Virgil (for the Romans) and the Oedipus plays of Sophocles are the texts through which the mythological consciousness is analysed. The course concludes with a consideration of why the Greeks broke away from the world of myth and began to understand nature and human culture through science and philosophy. This class is the same as CLAS 1100R and may therefore not be taken by anyone who has taken that class.

Instructor: J. P. Atherton
 Format: Lecture 2 hours
 Enrolment: 200 including Classics 1100R

***CLAS 2200R Ancient History:** The Ancient City: An introduction to Ancient History through a study of the constitutions of the Greek city states (especially Athens) and of Rome. Basic texts, such as Aristotle's Athenian Constitution, are read in English translation. This class is open to first-year

students. There is no foreign language requirement. This class is given alternately with **Class 2210R**.

Instructor: P. F. Kussemaul
Format: Lecture 2 hours
Enrolment: 50

CLAS 2210R Roman History: The Roman Empire and the Rise of Christianity: A continuation of the introduction to Ancient History through a study of the institutions and constitutional arrangements of the Roman Empire from the time of Augustus. The relation of the Empire to Christianity is a topic of primary interest. This class is given alternately with **Class 2200R** and, like it, is open to first-year students. There is no foreign language requirement.

Instructor: P. F. Kussemaul
Format: Lecture 2 hours
Enrolment: 50

CLAS 2361A/CLAS 2362B Ancient Philosophy from its Beginning to the Sixth Century AD: Proper attention is paid to the great classical philosophies of Plato and Aristotle studied in their historical context. Much emphasis is laid on the Greek philosophy of the first centuries AD and its influence on developing Christian thought.

The first half considers the history from the Pre-Socratics to Plato. The second half moves from Aristotle to Plotinus.

Instructors: J. P. Atherton/W. J. Hankey
Format: Lecture 2 hours
Cross-listing: PHIL 2361A/2362B
Enrolment: 50
Exclusion: CLAS 3361A/3362B

***CLAS 2501A Introduction to Classical Rhetoric:** In recent years rhetoric has attained great importance and significance for literary criticism and theory as well as for philosophy. The system of rhetoric and its terminology were developed and completed by the Greeks and Romans; therefore, Classical Rhetoric forms the basis of all modern approaches to rhetorical practice and theory. This class is intended to introduce the student to the system and to the central terms of rhetoric, as they have been developed and shaped in the relevant texts of Greek and Roman authors. All texts will be studied in English translation.

Instructor: R. Friedrich
Format: Seminar/Lecture 3 hours
Enrolment: 25

CLAS 2700R Intermediate Greek: A continuation of **CLAS 1700R** and the normal second year class in Greek. The work of the class is divided equally between formal grammar sessions and the reading of Greek texts from Xenophon, Lyellias and Plato. In the grammar sessions a complete and systematic review of all Greek grammar is undertaken during which the student meets

the more difficult forms and constructions which are omitted in **CLAS 1700R**. The aim of the class is to prepare the student to read the philosophical and dramatic texts of the 5th century BC.

Instructor: Staff
Format: Seminar 3 hours
Prerequisite: CLAS 1700R or 2710R
Enrolment: 25

CLAS 2710R Greek Prose: A study of Greek grammar through the reading of Greek prose authors (Xenophon, Lyellias).

Prerequisite: any 1000 level Classics class or equivalent.

Instructor: Staff
Format: Seminar 3 hours
Prerequisite: Any 1000 level Classics class or equivalent

Enrolment: 50

CLAS 2800R A Study of Latin Prose and Poetry: **CLAS 2800R** is a continuation of **CLAS 1800R** or **CLAS 2810R**. A study of the poetry and prose literature of Rome through a selection of texts. Particular attention is paid to improving the students' command of the grammar and syntax of the Latin language.

Instructor: P. F. Kussemaul
Format: Seminar 2 hours
Prerequisite: CLAS 1800R or 2810R
Enrolment: 25

CLAS 2810R Latin Prose: A study of Latin accidence and syntax through the reading of Roman prose authors (Caesar, Cicero).

Instructor: C. Stames
Format: Seminar 3 hours
Prerequisite: Any 1000 level Classics class or equivalent

Enrolment: 75

***CLAS 2860R Latin Historical Texts:**

Instructors: J. P. Atherton/P. F. Kussemaul
Format: Seminar 2 hours
Prerequisite: 1800R or 2810R
Enrolment: 25

***CLAS 3280R Christian Beginnings and the Early History of the Church:**

Format: Seminar 2 hours
Enrolment: Limited

***CLAS 3300R Pagan and Christian Schools from Clement of Rome to Augustine:** The class considers the mutual effect of pagan and Christian intellectual, spiritual and institutional forms on one another in the first four centuries of the Common Era. In particular it treats the way in which the pagan schools and the Christian church mirror one another: the common elements and their opposed systematic relations. Students will ordinarily have some background in Ancient History and Philosophy.

Instructor: W. J. Hankey
Format: Lecture 2 hours
Enrolment: Limited

***CLAS 3370R The Augustinian Tradition:**

The class considers the effect of Augustine on the philosophical and theological thought of late Antiquity and the Middle Ages. The relation to the Proclean Neoplatonism transmitted through Pseudo-Dionysius is a special concern. Texts from Dionysius, Eriugena, Anselm, Bonaventure, Aquinas and Cusanus are analysed. Students will ordinarily have begun either Greek or Latin though others may be admitted by permission.

Instructor: W. J. Hankey
 Format: Lecture 2 hours
 Enrolment: Limited

CLAS 3380R Medieval Philosophy: A study of the development of philosophy in the formative age of European civilization related to political, institutional, literary and theological concerns. An attempt is made to show how the legacy of classical and Christian antiquity was appropriated and reformed to constitute the ideology of medieval Christendom. The lectures are devoted mainly to the study and discussion of a few fundamental texts, beginning with Boethius' *Consolation of Philosophy*. Special attention is given to Anselm's *Prologion* and the first few questions of Thomas Aquinas' *Summa*. It is the object of lectures to present the continuity of the historical development and to emphasize broad implications of the philosophical doctrines presented in the texts. In the later part attention is given to late medieval Platonism and Mysticism, to show something of the Reformation and modern philosophical and religious thought.

Instructor: R. D. Crouse
 Format: Lecture 2 hours
 Cross-listing: PHIL 3380R
 Enrolment: 50

***CLAS 3400R The Dialogues of Plato:** This seminar involves the detailed study of a group of dialogues. The choice of dialogues varies from year to year.

Instructor: D. K. House
 Format: Seminar 3 hours
 Enrolment: 25

***CLAS 3410R St. Augustine's Confessions:** A study of the three parts of Augustine's *Confessions* with a view to understanding his dissatisfaction with the various positions he adopted prior to his conversion to Christianity (Part I), the practical consequences of this conversion (Part II), and the new theoretical understanding of time, space and motion which come out of his Trinitarian exegesis of the first chapters of Genesis (Part III). This class presupposes some knowledge of the history of Ancient Philosophy, and some of Latin. This class is given alternately with CLAS 3420R.

Instructor: C. J. Starnes
 Format: Seminar 2 hours

Enrolment: 35

***CLAS 3420R St. Augustine's City of God:** A study of Augustine's account of the failure of the Roman Empire and of the new Christian 'city' that replaced it. The class sometimes concentrates on the entire twenty-two books of the *City of God* and sometimes begins with a study of earlier accounts of Rome (*Aeneid*), and of the relations of Rome and the church in, for example, the Apostolic Fathers, the Acts of the Martyrs and Tertullian, before turning to the first ten books of the *City of God*. This class is given alternately with CLAS 3410.

Instructor: C. J. Starnes
 Format: Seminar 2 hours
 Enrolment: 35

CLAS 3470R, Reading and Research: Ancient Literature

CLAS 3480R, Reading and Research: Ancient History

CLAS 3490R, Reading and Research: Ancient Philosophy

***CLAS 3500R Aristotle:** This seminar involves the detailed study of either Aristotle's *Metaphysics* or *De Anima* or *Physics* or ethical and political treatises. The choice of texts varies from year to year.

Instructor: D. K. House
 Format: Lecture/Seminar 2 hours
 Recommended background: CLAS 2361A/2362B
 Enrolment: 25

CLAS 3510R Ancient and Modern Drama I: Ancient and Modern Drama I is a study of Western drama from its ritual beginnings in ancient Greece to its 20th century forms. It is presented in two parts, each forming a full credit class. However, both parts (CLAS 3510R and 3511R) are designed in such a way that they can be taken independently from one another. Ancient and Modern Drama I deals with ancient drama and theatre: their beginnings in the Dionysian ritual; the Dionysian festivals; production and stage conventions. The aim of this class is a study of Greek and Roman plays, both tragedies and comedies, by Aeschylus, Sophocles, Euripides, Aristophanes, Menander, Plautus, Terence and Seneca. This study will be accompanied by readings from Aristotle's *Poetics* and Horace's *Art of Poetry*. All texts will be studied in English translation. This class is given alternately with CLAS 3511R.

Instructor: R. Friedrich
 Format: Seminar 2 hours
 Recommended: CLAS 2000R
 Enrolment: 25

***CLAS 3611R Ancient and Modern Drama II:**
Format: Seminar 2 hours
Enrolment: 25

CLAS 3700R Advanced Greek: This class which reads both a prose and a poetic work is the normal third class in Greek.

Instructors: D. K. House/R. Friedrich
Format: Seminar 2 hours
Prerequisite: CLAS 2700R
Enrolment: 15

***CLAS 3710R Greek Epilo:**
Instructor: R. Friedrich
Format: Seminar 2 hours
Prerequisite: CLAS 2700R
Enrolment: 15

***CLAS 3720R Greek Lyric:**
Instructor: Staff
Format: Seminar 2 hours
Prerequisite: CLAS 2700R
Enrolment: 15

***CLAS 3730R Greek Drama: Tragedy:**
Instructor: R. Friedrich
Format: Seminar 2 hours
Prerequisite: CLAS 2700R
Enrolment: 15

***CLAS 3750R Greek Authors:**
Format: Seminar 2 hours
Prerequisite: CLAS 2700R
Enrolment: 15

CLAS 3760R Reading and Research of Greek Texts:
Format: Seminar 2 hours
Prerequisite: CLAS 2700R
Enrolment: 15

***CLAS 3780R Greek Historians:**
Format: Seminar 2 hours
Prerequisite: CLAS 2700R
Enrolment: 15

CLAS 3791A or B Reading and Research:
Format: Seminar 2 hours
Prerequisite: CLAS 2700R
Enrolment: Limited

***CLAS 3800R Roman Satire:**
Instructor: P. F. Kuesmaul
Format: Seminar 2 hours
Enrolment: 15

CLAS 3810R A Study of Vergil: A study of the development and importance of Vergil's basic themes and ideas embodied in the *Aeneid*. In the first part of the class special attention is given to his early work the *Bucolics*, where his themes begin to appear, and their development is then followed through the relevant parts of the *Georgics*. The main part of the class is devoted to the reading and discussion of the chief themes of the *Aeneid*, especially as they illustrate Roman political, religious and social ideas which have greatly influenced our own beliefs and institutions.

Instructors: J. P. Atherton/R. Friedrich
Format: Seminar 2 hours
Prerequisite: A class in Latin at the 2000 level.
Enrolment: 15

CLAS 3820R Advanced Reading in Latin Literature:
Format: Seminar 2 hours
Prerequisite: CLAS 2800R
Enrolment: Limited

***CLAS 3840R Latin Philosophical Texts:** The purpose is to give students experience in reading philosophical Latin. Various authors are read from Cicero to the late Middle Ages.
Instructor: R. D. Crouse
Format: Seminar 2 hours
Prerequisite: CLAS 2800R
Enrolment: Limited

CLAS 3850R Reading and Research of Latin Texts:
Format: Seminar 2 hours
Prerequisite: CLAS 2800R.
Enrolment: Limited

***CLAS 3900R The Philosophy of Aristotle:** The general scope of the Aristotelian Philosophy - the understanding of nature, the City, the aesthetic experience of humanity - is considered in relation to the argument of the *Metaphysics* or 'First Philosophy'. Given alternately with CLAS 3910R.
Instructor: J. P. Atherton
Format: Seminar 2 hours
Enrolment: 20

***CLAS 3910R Neoplatonism: Plato and Neoplatonism:** The philosophy of Plotinus and later thinkers considered as the resume of Greek Philosophy; in particular the role of Plato and other older philosophers in the formation of Neoplatonism is a principal interest. Given alternately with CLAS 3900R.
Instructor: J. P. Atherton
Format: Seminar 2 hours
Recommended: CLAS 2361A/2362B
Enrolment: 29

***CLAS 4200R Ancient Practical Philosophy:**
Format: Seminar 2 hours
Enrolment: Limited

***CLAS 4320R Ancient and Modern Dialectic:**
Format: Seminar 2 hours
Enrolment: Limited

***CLAS 4400R Philosophy of the Church Fathers:** This seminar involves the detailed study of a text, or group of texts, from one or more of the Greek or Latin Church Fathers. The choice of text varies from year to year, in relation to the needs and interests of students. Given alternately with CLAS 4450R.
Instructor: R. D. Crouse
Format: Seminar 2 hours
Enrolment: 20

***CLAS 4450R Medieval Interpreters of Aristotle:** The precise topic of this seminar is chosen in consultation with prospective students. For example, it might concentrate upon the interpretation of a work of Aristotle by Thomas Aquinas, or Albert the Great, or Dante. Given alternately with CLAS 4400R.

Instructor: R. D. Crouse
Format: Seminar 2 hours
Enrolment: 20

***CLAS 4500R Seminar on Neoplatonism:** Major Neoplatonic systems, pagan and Christian, are considered from Plotinus to Cusanus.

Instructor: W. J. Hankey
Format: Seminar 2 hours
Enrolment: 20

CLAS 4530R Seminar on the Roman Empire and the Rise of Christianity: Selected topics from the transition from Classical to Christian culture are studied. Particular attention is paid to the connection between religious innovation and the effect of the new beliefs on literature, art and philosophy.

Instructor: P. F. Kueemaul
Format: Seminar 2 hours
Enrolment: 20

CLAS 4580R Reading and Research

CLAS 4680A/4690B Reading and Research

CLAS 4710A/4720B Special Topics

CLAS 4800R Reading and Research

CLAS 4810A/4820B Special Topics

CLAS 4850R Reading and Research

CLAS 4900R Departmental Seminar:

Format: Seminar 2 hours

CLAS 0400C Honours Seminar: In order to obtain their Honours degree, students must complete twenty credits plus the Honours Seminar and pass the exam at the end of it. This is a non-credit class which meets every two weeks. Details available from the department. Note: Students are not required to take all units of this class in one year but may spread them out over two or three years to suit their individual programmes.

Instructor: R. Friedrich et al
Format: Seminar
Prerequisite: CLAS 2810R and CLAS 2710R
Enrolment: 10

Classes in Ancient Hebrew, Coptic, Syriac and Arabic, are sometimes available as electives at the discretion of the Department, only in relation to the needs of the particular student.

Co-operative Education in Science

Academic Director

A.E. Sedgewick, PhD (Tor)

Placement Officer

C.L. Harding, BSo (Dal), (902) 494-2044
Student Union Building, Room 404

Academic Advisors

A.E. Sedgewick, Mathematics, Statistics, and Computing Science
J.M. Hall, Earth Sciences
B.L. Blackford, Physics
M.J. O'Halloran, Marine Biology

Co-operative Education Programmes

In Canada Co-operative Education means a programme alternating academic terms with paid work experience related to the area of study. An increasing number of departments in the Faculty of Science offer students this option. The academic requirements are generally the same as for an Honours or Advanced Major degree. See the departmental listings for more information. The workterms alternate with academic semesters beginning in January or May of Year II. The workterms, each 13-16 weeks in duration, are spent in industrial, business, government or laboratory positions. The work experience helps students see the applicability of their training in science and helps them make intelligent career choices. Upon successful completion of at least 3 workterms and the 20-credit academic requirements, the student's transcript will have indicated the programme to be a co-operative one.

A Co-op degree normally takes 4 1/3 years. The Physics programme is 5 years. The programmes are available either as Honours or Advanced Major programmes. Earth Science and Physics are Honours only. A Combined Honours Co-op degree, combining a Co-op subject and another appropriate subject, is possible. Students interested in such a programme should consult a Co-op advisor.

Eligibility: Students must be Canadian citizens or landed immigrants and demonstrate sufficient academic potential (typically B-average). Some students may be admitted on a probational basis pending an improvement in their grades. Students whose grades drop significantly may be withdrawn from the Co-op option.

Application: Students should apply to one of the academic advisors near the end of first year and indicate Co-op when they register for second year.

Academic Advice: Students must plan their programmes carefully each year with their departmental academic advisor who must approve any changes. Co-op students have limited opportunity to take R classes. Also the choice of classes for the summer academic term is limited.

Work Terms: Although the Co-op Office has an outstanding placement record, it is ultimately the responsibility of the student to arrange the work term. The Placement Officer serves to co-ordinate the contacts between student and employer. Students are remunerated according to the employer's own policies.

It is important that students realize that successful completion of the work terms is an integral part of the course of study. Indeed, the advantages of Co-op Education derive directly from the successful interplay of academic knowledge and practical implementation. Consequently the work terms are central to Co-op Education.

Work Term Reports: At the end of each work term, each student must submit an acceptable work report. These are generally 15-20 typewritten pages. Guidelines are available from the academic advisor and the Co-op Office. The reports must be submitted by the 15th day of the month the following academic term begins.

Work Term Sequence: Work terms alternate with study terms in a fixed pattern for each programme.

	A	B	S	A	B	S	A	B	S	A			
a)	1	2	-	3	w	4	w	5	w	6	7	w	8
b)	1	2	-	3	4	w	5	w	6	w	7	w	8
c)	1	2	-	3	4	w	5	6	w	w	7	w	8

Most students follow pattern a) with first work term in January of second year. Pattern b) is for Marine Biology. Pattern c) is for Earth Sciences. Changes to a pattern require prior approval. Sometimes two consecutive work terms are arranged.

Co-op Seminar: This is a special seminar arranged for the benefit of Co-op students. Various topics of relevance to the work terms are discussed. The purpose of the seminar is to better prepare students for their work terms so that everyone involved in the work term — the student, the employer, and the University — may benefit as much as possible.

Co-op students enrolled in their second year at Dalhousie must attend this non-credit seminar (min. of 12 hours required).

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Additional information: For additional information contact one of the departments listed above or: Science Co-operative Education, Dalhousie University, Student Union Bldg., Room 404, 6136 University Avenue, Halifax, Nova Scotia, B3H 3J5, (902) 494-2044.

Comparative Religion

Location: 6209 University Ave., 3rd floor, Halifax, N.S.
Telephone: (902) 494-3579
Fax: (902) 494-1997

Chair

R. Ravindra (494-3578)

Undergraduate Advisor

C.T. Sinclair-Faulkner (494-3579)

Professor

R. Ravindra, BSc, MTEch (IIT), MA (Dal), MSc, PhD (Tor), Adjunct Professor of Physics

Associate Professor

C.T. Sinclair-Faulkner, BA (Tor), MTh, MA, PhD (Chic)

Introduction

The University study of religion aims at an intellectual understanding of this more than intellectual reality. Religion is a phenomenon virtually universal in human society and history; some have held that it is central to the human condition. Understanding involves grasping simultaneously both the meaning of faith in the lives of participants, and the critical analysis of outside observers. Both the student wishing enhanced understanding of religion as an historical, and social and human fact, and the student who wishes to wrestle with problems arising in academic reflection concerning the relation between the personal and the objective, can find material to engage them in the classes described below.

Advanced Major

The Department is able to offer an advanced major in the 20-credit programme. For further information refer to specific regulations for the 20-credit programme on page 97.

BA Degree

Students wishing to major in Comparative Religion must successfully complete Comparative Religion 1000R or 1301R, and at least four to eight full-year classes or their equivalent in Comparative Religion beyond the 1000 level. These must include at least two from each of the groups (2001A or B, 2002A or B, 2003A or B) and (2011A or B, 2012A or B, 2013A or B). After earning at least 10 credits of any kind, students must successfully complete one class in Comparative Religion beyond the 3000 level

(see "Topics in Comparative Religion"). This provides them with a broad introduction to both Eastern and Western religious life, and to the various ways in which religion may be studied. In light of their specific interests, Comparative Religion majors are encouraged to enrol in related classes offered by other Departments. Programmes should be planned in consultation with the undergraduate advisor, Dr. C.T. Sinclair-Faulkner.

Please consult the current timetable on registration to determine which classes are being offered.

Classes Offered

First-year students are not admitted to classes beyond the 1000 level without the consent of the instructor. Classes at the 2000 level do not have prerequisites; in general, they are available only to students in their second year or above. Prerequisites for classes at the 3000 and 4000 levels are listed with each individual class below; in general, they are available only to students in their third year or above in the University.

***CREL 1000R/2000R Introduction to World Religion:** This class will focus on a comparative study of Christianity and other major world religions. The first half of the class will be an introduction to the basic ideas and concerns of the world religions with an emphasis on fundamental general questions in comparative studies: What materials in different traditions are comparable? What psychological and intellectual attitudes are required for such a study? The second half is devoted to a comparative study of the Gospels and a scripture from another religion. Extra work will be required in 2000R which is not available to first year students.

Instructor: R. Ravindra
Format: lecture and tutorial 3 hours

***CREL 1301R Introduction to the Study of Religion:** Religion is: a way of life? an encounter with God? a neurosis? the essential human trait? an epiphenomenon? The possibilities are explored by using the insights of modern social scientists, humanists and theologians to study Canadian life. This class fulfils the first-year Writing Requirement. A detailed syllabus is available from the Department of Comparative Religion.
Instructor: C.T. Sinclair-Faulkner.
Format: lecture 2 hours, section meeting 1 hour

***CREL 2001A or B Judaism:**

About thirty-three hundred years ago a man named Moses is said to have led the people of Israel out of slavery in Egypt, bound them in a covenant with God to live in the way that God would have them live, and

brought them to the land of Canaan. They became the people of the Bible (literally, "the Book") and, when their temple at Jerusalem was destroyed two thousand years ago, they developed a dispersed community centred on the Bible as interpreted by their rabbis or teachers. Although six million Jews died in the Holocaust during the Second World War, there are fourteen million Jews in the world today, of whom roughly one-fifth live in the state of Israel (established in 1948) and over 300,000 live in Canada.

Instructor: C.T. Sinclair-Faulkner
Format: lecture and seminar 3 hours

***CREL 2002A or B Christianity:** Christianity was founded two thousand years ago by Yehoshuah (Jesus), a Jew living in the Roman province of Palestine who left behind no writings of his own and who was executed for treason and blasphemy. Before his death he gathered together a diverse group which included some fishermen, a tax collector, a rich woman and a rabbinical student. They and others who joined later became the "Church" (literally, "the things which belong to the Lord"), declaring that Yehoshuah had risen from the dead and that he was both the Messiah and the Son of God. This claim scandalized many Jews and puzzled many Greeks. But Christianity went on to shape much of western civilization, and ultimately the world. Today Christianity is the religion of at least one billion people around the world, and of 90% of Canadians.

Instructor: C.T. Sinclair-Faulkner
Format: lecture and seminar 3 hours

***CREL 2003A or B Islam:** Islam was founded by Muhammad less than fourteen hundred years ago, and it may be argued that it was the first "world" religion. The Arabic word "Islam" means many things at once: submission, obedience, surrender, peace. Setting his face resolutely against the worship of false gods, Muhammad accepted Jews and Christians as "People of the Book" but added the Qur'an to the TANAKH and the New Testament as the scriptures which reveal the way in which Allah (literally, "the God") would have people live. Muhammad is God's messenger, delivering the Holy Qur'an, but Muhammad himself is not divine. At present Islam is the fastest growing religion on earth. There are almost one billion Muslims in the world, of whom more than 100,000 live in Canada.

Instructor: C.T. Sinclair-Faulkner
Format: lecture and seminar 3 hours

***CREL 2011A or B Hinduism:** What has been called **Hinduism** in modern times is less a religion in the Western sense and more a whole way of life woven into the very fabric of the culture and society in India where nearly six hundred million Hindus reside. This

religion is said to be eternal, without any human founder, although continually vitalized by many remarkable sages and incarnations of God. The oldest religion in the world, Hinduism displays an unbroken continuity of the tradition from the pre-historic times to the present, spanning at least five thousand years. Other major and minor religions have been spawned by Hinduism, such as Buddhism and Jainism; also Sikhism and Sufism in interaction with Islam. The religious and cultural life of much of the Asian continent, on which now lives more than half of humanity, has been strongly influenced by one or another aspect of Hinduism.

Instructor: R. Ravindra
Format: lecture and seminar, 3 hours

***CREL 2012A or B Chinese and Japanese Religions:** China and Japan have had an enormous impact on the cultural history of the world in the past, and are also bound to have significant impact in the future. The religious ideas and practices which originated and developed in these countries influence nearly half of mankind today. These days, many Westerners are also drawn to the practical and holistic views of Taoism and Confucianism.

This course will provide an introduction to the major religious traditions in China and Japan, namely, Taoism, Confucianism, Buddhism and Shintoism.

Instructor: R. Ravindra
Format: lecture and seminar, 3 hours

***CREL 2013A or B Buddhism:** Buddhism originated in India in the 6th century B.C.E. with Siddhartha Gautama, the Buddha -the Enlightened and the Compassionate- and from there spread throughout South East Asia and the Far East in the following millennium. It practically disappeared from the land of its origin after nearly sixteen hundred years during which time it permanently influenced Indian thought and spirituality. Buddhism was considerably modified by the great cultures of China, Korea and Japan.

Buddhism has influenced the religious world-views and practices of more than half of humanity, largely owing to its great impact in Asia. Now, many Westerners are also drawn to the philosophy and meditative practices of different forms of Buddhism. This class will offer a basic introduction to the history, ideas and practices of Buddhism.

Instructor: R. Ravindra
Format: lecture and seminar, 3 hours

***CREL 2200A or B Religion and War:** Religious attitudes toward war have ranged from pacifism, through vigorous efforts to enforce limits on war's destructiveness, to outright support for specific wars. The class

will examine comparatively the views of major religious traditions on war; the use of war and the warrior as religious symbols; the origins of religious views on war in the nuclear age. It is cross-listed with Religious Studies 342.2 at Saint Mary's University.

Instructor: C.T. Sinclair-Faulkner
Format: lecture and seminar 3 hours

***CREL 3002R Religion in Story:** When religious people seek answers to ultimate questions or try to come to grips with the mystifying phenomenon of the Holy, they turn to stories. Modern novels and short stories, particularly Canadian works, are the primary reading assignments in this class. They are set in the context of related material from the broader western culture, including the Jewish scriptures. A detailed syllabus is available from the Department of Comparative Religion.

Instructor: C.T. Sinclair-Faulkner
Format: lecture and seminar 3 hours
Prerequisites: at least one of CREL 2001A or B, CREL 2002A or B, CREL 2003A or B or permission of the instructor

***CREL 3003R Religion in Canada:** When Canadians have built cities, gone to war, founded economic empires, fallen in love, designed school systems, and elected governments, religion has often been a decisive factor. Sometimes religion has been the decisive factor. What is "religion" in Canada? In the course of this extensive historical study of life in Canada from the 15th century to the present, a variety of answers will be explored. A detailed syllabus is available from the Department of Comparative Religion.

Instructor: C.T. Sinclair-Faulkner
Format: lecture and seminar 3 hours
Prerequisites: CREL 2001A or B or CREL 2002A or B or permission of the instructor

***CREL 3006A or B Western Spirituality - Mystics:** Some have argued that the mystic's experience lies at the heart of all religions, while others see it as dangerous to what has traditionally been regarded as religion. Original accounts of Jewish, Christian, Muslim and Amerindian spiritualities are studied in their historical context in this class. A detailed syllabus is available from the Department of Comparative Religion.

Instructor: C.T. Sinclair-Faulkner
Format: lecture and seminar 3 hours
Prerequisites: at least one of CREL 2001A or B, CREL 2002A or B, CREL 2003A or B or permission of the instructor

***CREL 3007A or B Western Spirituality - Communities:** Modern persons tend to view religion as a solitary enterprise, but more

often than not religious communities have taken shape around those who have had a profoundly religious experience. Original accounts of Jewish, Christian and Muslim spiritualities are studied in their historical context in this class. A detailed syllabus is available from the Department of Comparative Religion.

Instructor: C.T. Sinclair-Faulkner
Format: lecture and seminar 3 hours
Prerequisites: at least one of CREL 2001A or B, CREL 2002A or B, CREL 2003A or B or permission of the instructor

***CREL 3014A or B Love and Death in World Religions:** lecture and seminar, 3 hours, R. Ravindra. What are love and death? Why do mystics in many traditions speak of love and death together? What meaning can life have in the face of the inevitability of death? Does individual identity come to a complete end or does one continue existence in some form, as most religions assert? What is the nature of judgment after death? Is there reincarnation?

Instructor: R. Ravindra
Format: lecture and seminar, 3 hours a class in Comparative Religion or the permission of the instructor; students must be in third year or above

***CREL 3015A or B Myths, Symbols and Rites:** Myths, symbols and rites have been among the major vehicles of spiritual truths and psychological insights in all religions. After a general discussion of the nature of symbolic and mythic understanding, the focus is on some of the major myths and symbols associated with the lives and teachings of Krishna, Shiva, Gautama Buddha and Jesus Christ.

Instructor: R. Ravindra
Format: lecture and seminar, 3 hours
Prerequisites: a class in Comparative Religion or the permission of the instructor; students must be in third year or above

***CREL 3532A or B Mystical Consciousness and Modern Science:** Yoga, Zen, Prayer of the heart, Sufism and other spiritual disciplines have gathered an enormous amount of experiential and theoretical material about human consciousness and its many levels, from the ordinary to the mystical and cosmic. The first term is devoted to understanding many levels of human consciousness based on these disciplines. The second term is devoted to a critical examination of mystical consciousness in the light of modern scientific discoveries, and of the fundamental presuppositions of modern science in the light of the universal experience and knowledge of the many levels of consciousness.

Instructor: R. Ravindra
Format: seminar 3 hours
Prerequisite: a class in Comparative Religion or in Science (preferably both); students must be in third year or above.
Exclusion: CREL 3531R

***CREL 3533A or B Spirituality and Ecology:** What is the scientific and technological understanding of Nature? How does this relate with the religious views about the cosmos? Are the roots of our contemporary ecological crisis to be found in the relationship between human beings and nature as mentioned in the Bible? Can the Hindu-Buddhist traditions and the North American native spirituality offer something of practical value for the cultivation of the right attitude to the environment and our place in the universe?

Instructor: R. Ravindra
Format: Seminar 3 hours
Prerequisite: a class in Comparative Religion or in Science (preferably both); students must be in third year or above.
Exclusion: CREL 3531R

***CREL 3502A or B The Rise of Modern Science:** The modern world has been fundamentally altered by science and technology. In what ways? How has this come to be? This class, designed for students in the arts as well as the sciences, examines these questions by looking at the origins of modern science in the 16th and 17th centuries, its growing popularity in the 18th century, and the rise of the scientific profession and science-based industry in the 19th and 20th centuries.

Instructors: J. Farley (Biology) and R. Ravindra (Comparative Religion/Physics)
Format: lecture/tutorials 4 hours
Prerequisites: see Biology 3402A or B

***CREL 3503A or B Nuclear Bombs: Survival and Morality:** This class, designed for students in the arts and the sciences, will study the history of atomic bomb development, the moral issues involved in the destruction of Hiroshima and Nagasaki, and the concerns about human survival raised by the proliferation of these weapons.

Instructor: R. Ravindra
Format: seminar 3 hours
Prerequisite: CREL 3502A or B (or equivalent) or permission of the instructor

***CREL 4310A or B Topics in Comparative Religion/*CREL 4320A or B Independent Study in Comparative Religion:** Structured as a seminar or for independent guided study depending on the interests and needs of the students and the faculty. The intention is to

devote some concentrated time to a specific topic of interest (e.g., *Cults and New Religions*, *The Feminine in World Religions*, *Religious Aspects of Middle-East Politics, Tradition and Modernity*). Please consult the Department for the topic which may be discussed in any given term. These classes will normally only be arranged at the request of a student who is majoring in Comparative Religion, though other students may then be admitted to the class upon application to the instructor. These classes permit the student majoring in Comparative Religion to integrate the work of many previous classes and lines of study while examining some chosen topic in the academic study of religion.

Instructor: staff
Format: seminar 3 hours, staff

Computing Science

Location: Chase Building
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Chair of Department
 R. P. Gupta

Director of Division
 A.E. Sedgwick

Faculty Advisors

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 A. Farrag (Graduate)
 A.E. Sedgwick (Co-op)

Professors

P.Keast, PhD (St. Andrews)
 K.J.M. Moriarty, MSc (Dal), PhD (London)
 M.A. Shepherd, MSc, PhD (Western)

Associate Professors

A. Farrag, PhD (Alberta)
 C.S. Hartzman, MS (Purdue), PhD (Colorado)

Assistant Professors

A.E. Sedgwick, MS (Wisconsin), PhD (Tor)
 S. Srinivas, PhD (Ind. Inst. of So.)
 D. Teang, MASc (TUNS), PhD (Penn.)
 C. R. Watters, MSc (Western), PhD (TUNS)

Computer Systems Manager

D. Trueman, MSc (Toronto)

Adjunct Professors

H.S. Heaps, MA (Tor) LL.D (St FX)
 H.S.P. Jones BSc (Wales) MSc (Southampton)
 L. Oliver, MSc (Acadia), PhD (McG)
 S. Sanilevidi, PhD (McG)

Please refer to the entry for the Department of Mathematics, Statistics and Computing Science for a full listing of the members of the Department and information on other programmes offered by the Department.

General Interest Classes

The Division offers a number of classes that should be of interest to students whose major field of study while at Dalhousie will not be Computing Science. These classes are:

CS1000A or B: A class designed for the humanities and social sciences but probably of interest to students in other disciplines as well.

CS1200A and CS1210B: The main purpose of these classes is to provide an introduction

to computing suitable for science majors. This pair of courses leads naturally into CS3170, CS3210, and CS3350.

CS3090A: A class that should be of interest to students in all disciplines.

Degree Programmes

Students who plan to pursue a programme leading to a degree in Computing Science should arrange a programme in consultation with the appropriate Faculty Advisor, listed above. Students should also consult the appropriate sections of the Calendar for specific regulations.

Honours in Computing Science

The Honours programme in Computing Science must include the following courses usually taken in the years shown:

Year 1: Math 1000, Math 1010, CS1400, CS1410, CS1670+,

Years 2&3: CS2450, CS2350, CS2610, CS2700, CS2670, CS3170, Math/Stat 2060, Math/Stat 2080, Math 2130 or (Math 2030, Math 2040), CS3250, CS3040, CS3700

Year 4: CS8870, and four 4000-level CS courses and an Honours Thesis.

Honours Thesis: The Honours Thesis should comprise a body of work equivalent to a half credit, and would normally be worked on for the whole of the last year of the Honours programme. The thesis must be supervised by a faculty member, and must be read by the supervisor and one other faculty member.

Attendance at the Honours seminar is required for all Honours students during the last ten credits.

⁺Typically taken within the first two years.

Combined Honours

Students interested in taking honours in Computing Science and another subject as a combined programme should consult the honours advisor through whom a suitable course of study can be arranged.

A combined honours programme may well be an appropriate choice for many students. If a student is contemplating graduate work, it should be borne in mind that the work in either subject of a combined honours programme may be insufficient for entry to a regular graduate programme, and that a qualifying year may be necessary.

Advanced Major in Computing Science

Advanced majors in Computing Science must obtain at least six (and no more than nine) credits beyond the 1000-level in

Computing Science, with 3 full credits beyond the 2000-level. In addition to the necessary first-year prerequisites (i.e. Math 1000, 1010, Computing Science 1400, 1410) the following classes are required:

Year 2: CS 2350, CS 2450, CS 2610, CS 2700, Math 2030

Year 3: CS 3040, CS 3170, CS 3250, CS 3700

For further information consult sections 11.1, 11.2 and 11.4 of the College of Arts and Science regulations in this calendar.

Major in Computing Science

Majors in Computing Science must obtain at least four (and no more than eight) credits beyond the 1000 level in Computing Science.

In addition to the necessary first-year prerequisites (i.e. Math 1000, 1010, Computing Science 1400, 1410) the following classes are required:

Year 2: CS 2700, CS 2350, CS 2450, CS 2610, Math 2030

Year 3: CS 3170, CS 3700.

Students wishing to major in Computing Science will normally take the pair CS 1400/1410, but it will be possible to proceed from CS 1200/1210 into a Computing Science programme after consultation with the Undergraduate Advisor (see above).

Students who wish to arrange inter-disciplinary programmes (with fields such as Mathematics, Physics, Psychology, and others) are invited to discuss their interests with the department.

Co-operative Education Programmes

The department offers several Co-op education programmes involving Computing Science, a concentrated programme in Computing Science, a 20-credit major programme and a combined programme with Mathematics.

Computing Science Co-op students are required to take all the classes that non Co-op students take.

Further information about the Co-op programmes is included under the Calendar entry for Mathematics. Interested students should note that some departmental regulations for Co-op students differ from those regulations for students not in the Co-op programme.

Any student who is interested in enrolling in a Co-op programme is urged to contact the Faculty Advisor for Co-op Education as early as possible in their academic career for advice on classes and other information.

Prerequisites

If a Computing Science class is listed as a prerequisite for a Computing Science class beyond the first year level, a grade of C or better is required in the listed class for it to count as a prerequisite.

Other Information

The Department operates a network of SUN systems, running Unix with 24 Xterminals, for Computing Science students. The Xterminals are located in the Killam Library Building. Colour workstations are available to senior students. The University also operates a VAX running VMS and an Alliant Fx/2816 running concentrix that are used for some Computing Science courses and has a PC lab and a Macintosh lab available for course work and student use.

Students who complete the first two years of a Dalhousie programme in Computing Science may complete their programmes at Dalhousie or may be able to transfer to the Technical University of Nova Scotia (TUNS) to complete a Bachelor of Computing Science with Engineering options. Further information about the classes required for admission to a TUNS programme may be obtained from TUNS or the Department of Mathematics, Statistics and Computing Science.

Note that credit may not be obtained for the same class twice even if the number has been changed (e.g. 2700 is the same as the former 3690).

Classes Offered

Not all classes are necessarily offered every year. Please consult the current timetable on registration to determine if a class is offered.

COMP1000A or B Microcomputer

Applications: The goal of this class is to learn how to make correct use of contemporary computer application software. Spreadsheets will be used to carefully design and implement models in mathematics, the sciences, and the social sciences. The proper design of database schemes to accurately represent data and their interrelationships will be introduced through the use of database management systems. Societal issues connected with computing will be woven into the fabric of the course. Students will write essays based on these issues using word processing software. Some sections of this course use PC microcomputers, the others use Macintosh computers.

Format: lecture 3 hours, tutorial 1 hour

Prerequisite: None

Exclusion: Note that Computing Science students may not take this course for credit after CS1400.

COMP1200A Introductory Computing Science: Together with CS1210 this class provides an introduction to Computing Science. No previous knowledge of computing is assumed. The course will teach the elements of programming and algorithm development. The language which will be used is FORTRAN. Throughout the course the emphasis will be on numerical and scientific applications.

Format: lecture 3 hours, tutorial 1 hour
Prerequisite: Nova Scotia Math 441 or equivalent

Exclusion: Credit will be given for only one of CS1200 and CS1400

COMP1210B Scientific Applications and Algorithms: This is a continuation of CS1200. The course will deal mainly with scientific applications of computers and with the development of algorithms for scientific problems. Elementary numerical techniques will be taught and deterministic and random simulation will be discussed.

Format: lecture 3 hours, tutorial 1 hour
Prerequisite: CS1200 (or CS1400 and Instructor's consent), and Math 1000

Exclusion: Credit will be given for only one of CS1210 and CS1410

COMP1400A Introduction to Computing Science: This course provides a general introduction to computing science, algorithmic concepts, and structured programming. The main focus is to teach the students programming skills in C and how to apply these skills in solving a variety of useful problems.

Format: lecture 3 hours, tutorial 1 hour
Prerequisites: Nova Scotia Math 441 or equivalent

Exclusion: Credit will be given for only one of COMP 1400 and COMP 1200

COMP1410B Algorithms and Data Structures: This is an introductory course on data structures and algorithms. The prerequisite is CS 1400 or familiarity with the programming language C. The topics include: algorithms analysis, abstract data types, elementary data structures (arrays, stacks, queues, and lists), trees, recursion, sorting and searching.

Format: lecture 3 hours, tutorial 1 hour
Prerequisite: CS1400 (or CS1200 and permission of the instructor) and Math 1000.

Exclusion: Credit will be given for only one of COMP 1410 and COMP 1210

COMP1670A Discrete Structures I: For description see Math 1670A.

Format: lecture 3 hours
Prerequisite: Nova Scotia Mathematics 441 or equivalent

Cross-listing: Mathematics 1670A

COMP2300B Introduction to Mathematical Modelling Using Algebra: For description see Math 2300B.

Format: lecture 3 hours
Corequisite: Math 2030
Cross-listing: Math 2300B

COMP2350A File Structures and Relational Databases: The relational data model is introduced. Efficient retrieval and manipulation of data stored in relational databases motivates the study of file and index structures. The class examines logical file organizations (indexed sequential files, direct files, tree-structure files, etc.), file operations, and their physical implementations. The entity-relationship model, used for proper database design, is introduced. The class will make use of commercial, micro-computer based relational database software.

Format: lecture 3 hours
Prerequisite: CS1410

COMP2450B Introduction to Computer Systems: An introduction to machine architecture from the perspective of an assembly language programmer. Students gain familiarity with an assembly language and the translation process needed to produce machine code. Common addressing modes, macros and file I/O are discussed, together with the internal structure of memory, control units and processing units.

Format: lecture 3 hours
Prerequisite: CS1410

COMP2610A Data Structures and Algorithmic Analysis: Data types and the operations on them are covered in this class. After a review of the data structures covered in CS1410, the class proceeds in detail to examine trees, graphs, sets and strings. Efficient representations and algorithms for these structures are discussed. External file sorting methods are also discussed. Considerable emphasis is placed on the analysis of algorithms.

Format: lecture 3 hours, tutorial 1 hour
Prerequisite: CS1410

COMP2670B Discrete Structures II: For description see Math 2670B.

Format: lecture 3 hours
Prerequisite: C.S.1670
Cross-listing: Mathematics 2670B

COMP2700B Programming Languages: The emphasis is on fundamental concepts such as block structure and recursion and structured control flow. Exercises are given in several

languages such as Lisp and Prolog. Recursion and functional programming are extensively discussed as well as an introduction to program correctness.

Format: lecture 3 hours
Prerequisite: CS2610

SCI 3000R Science Fundamentals: An interdisciplinary class that stresses the motivations, methodologies, and responsibilities of scientists, and provides extensive formal instruction in written and oral communication of scientific material. For details, see main calendar entry "Science, Interdisciplinary." The status of this class (elective, minor, or major credit) varies from department to department; check with your undergraduate advisor.

COMP3040A Introduction to Computer Organizations: An introduction to logic design and detailed computer architecture. Basic logic elements such as gates and flip-flops are discussed and the design of combinational networks, registers and control mechanisms analyzed. Internal representation and arithmetic, communication between components, instruction fetch and sequencing, interrupts and I/O controllers are also discussed.

Format: lecture 3 hours
Prerequisite: CS2450

COMP3090A or B Computers and Society: The impact of computers on society is discussed in this class. Topics include the history of computing and technology, the place of the computer in modern society, legal issues such as the copywriting of software, the computer scientist as a professional, the impact of databases on individual privacy and the public perception of computers and computer scientists.

Format: lecture 3 hours
Prerequisite: None

COMP3170B (formerly 2270) Introduction to Numerical Linear Algebra: Floating point arithmetic. Numerical solution of linear systems of equations; Gauss elimination methods and iterative methods; condition numbers of problems and of algorithms; estimation of condition numbers. Numerical calculation of eigenvalues; QR and LR algorithms; singular value decomposition; Gram Schmidt orthogonalization. Use is made of program libraries such as Linpack, Eispack and Matlab.

Format: lecture 3 hours
Prerequisites: Math 1010, Math 2030, CS 1410

Cross-listing: MATH 3170

COMP3210A or B (formerly part of 320) Introduction to Numerical Analysis: See class description for Mathematics 3210B.

Format: lecture 3 hours

Prerequisites: MATH 2000 and CS3170
Cross-listing: MATH 3210B

COMP3260A Data Base Management Systems Design: The concepts and structures necessary to design and implement a data base management system are stressed. Hierarchical, network and relational models are discussed with emphasis on the necessary logical and data structures. Various normal forms and canonical schemas are discussed as well as the concepts of relational algebras and relational calculus.

Format: lecture 3 hours
Prerequisite: CS2350

COMP3350A or B Introduction to Supercomputing: An introduction to the computer architecture of the supercomputers of today: CRAY X-MP, CRAY 2, FUJITSU VP2000, NEC SX-3, and Alliant FX/2800. The software for the efficient implementation of vectorization and parallel processing will be discussed.

Format: lecture 3 hours
Prerequisites: CS 3170 and CS2450

COMP3390A or B Statistical Computing: For description see Stats 3390

Format: lecture 3 hours
Prerequisites: Statistics 3390, Mathematics 2040, CS1210 (or 1410)

Cross-listing: STAT 3390

COMP3700B Operating Systems I: This class covers the principles of modern operating system design with examples from existing systems. Specific topics include: concurrent processes, interprocess communication, synchronization, scheduling policies, multi-level storage management, and associated algorithms.

Format: lecture 3 hours
Prerequisite: CS2610

COMP3750A or B Artificial Intelligence: An introduction to basic concepts and techniques of artificial intelligence systems with insights given into active research areas and applications. Representational issues and notational structures are emphasized and existing systems are surveyed. Students work on assignments and small projects using Lisp.

Format: lecture 3 hours
Prerequisite: CS2700

COMP4100A or B Operating Systems II: A further development of the material of Operating Systems I, but with the focus on distributed operating systems. Topics include the client-server model, IPC, light weight processes, RPC, distributed file systems, distributed transactions, transparency and reliability.

Format: lecture 3 hours
Prerequisites: CS3700B

COMP4130A or B Analysis of Algorithms: This class covers algorithmic solutions to a wide variety of problems and a formal analysis of their complexity. It is a continuation of the 2610 class. Problems are taken from combinatorics and numerical computation including algorithms for unordered and ordered sets, graphs, fast multiplication, prime testing, factoring, polynomial arithmetic and metric operations. Other topics include the analysis of algorithms used in systems programming and artificial intelligence, such as pattern matching for text processing and algorithms in natural language processing.
Format: lecture 3 hours
Prerequisite: CS2700
Cross-listing: MATH 4130

COMP4140A or B Software Design and Development: This class involves a formal approach to state-of-the-art techniques in software design and development. Students work in teams in the organization, development and management of a large software project. Formal models of structured programming, stepwise refinement and top-down design, strength and coupling measures, milestones and estimating, chief-programmer teams, programme libraries and documentation are included.
Format: lecture 3 hours
Prerequisite: CS2700

COMP4150A or B Theory of Programming Languages: This is a class in the formal treatment of programming language translation and compiler design concepts. Topics include lexical analysis and parsing with emphasis on the theoretical aspects of parsing context-free languages, translation specification and machine-independent code optimization. Finite state grammars, lexical scanners, and context-free parsing techniques such as LL(k), precedence, LR(k), SLR(k) are included.
Format: lecture 3 hours
Prerequisite: CS2700

COMP4200B Selected Topics in Computing Science:
Format: lecture 3 hours

COMP4250A or B Information Retrieval: An introduction to online information retrieval systems for textual databases. The major models of information retrieval will be covered as well as such basic topics as automated indexing and performance measures, and hypertexts.
Format: lecture 3 hours
Prerequisite: CS2350

COMP4350A or B Object-Oriented Programming: An introduction to

object-oriented programming (OOP) and object oriented analysis, object oriented design, and C++.
Format: lecture 3 hours
Prerequisites: Three 3000 level CS courses

COMP4400A or B Programming Methodology: Techniques for verification of computer programmes. Formal specification of software.
Format: lecture 3 hours
Prerequisite: B average in 3000-level Computing Science courses

COMP4450A or B Introduction to Data Communications: The elements of data communications and the structure of computer networks will be discussed. The course uses the ISO model as a reference and includes an introduction to basic data transmission techniques, computer network topologies and architectures, and a look at some specific implementations and applications. This course will concentrate on the lower layers of the ISO model.
Format: lecture 3 hours
Prerequisites: STATS 2070/2080

COMP4550A or B Microcomputers: This course provides an overview of microcomputer systems both at the general concept level and by examining specific systems. General architecture topics include instruction sets, memory I/O, bus systems and interrupt structures. Specific systems by several different manufacturers are examined on the basis of both hardware and software.
Format: lecture 3 hours
Corequisite: CS3700

COMP4650A or B Selected Topics in Information Retrieval: Assuming that the student has a broad understanding of the field of information retrieval, this course takes an in-depth look at selected topics at the forefront of the field. The topics will vary slightly from year to year, but may include: clustering and nearest neighbour matching, information theory, bibliometrics, and new models of information retrieval.
Format: lecture 3 hours
Prerequisite: CS4250

COMP4660A or B Automata and Computability: This class deals with finite state, pushdown and linear bounded automata; their correspondents in the Chomsky hierarchy for formal grammars and Turing machines. Appropriate closure properties and non-determinism are discussed as well as computable and noncomputable functions and the Halting problem.
Format: lecture 3 hours
Prerequisite: CS2670
Cross-listing: MATH 4660

COMP4670A or B Computer Graphics:

Graphics for computing science include topics on graphical kernel system (GKS), rotation, compression, segmentation, analysis, and fractals.

Format: lecture 3 hours

COMP4700A or B Advanced Topics in Data Base Design: Topics vary from year to year depending on the interests of the students and the instructors. Past topics have included concurrency control, scheduling, query optimization and object-oriented data bases.

Format: lecture 3 hours

Prerequisites: CS3250

COMP4800A Computer Systems Modelling:

This course develops queueing network models suitable for modelling computer systems. Approximate and exact solutions to these models are developed and single and multiple classes of users are considered. Modelling multiprocessors, I/O, shared memory, swapping, paging, etc. are also considered. Finally, some of the modelling techniques are applied to other situations such as database performance. The models are developed intuitively and justified rigorously using queueing network theory.

Format: lecture 3 hours

Prerequisites: CS3700 and Stats 2070/2080

COMP8700 (non credit) Co-op Seminar

COMP8870C Honours Seminar

COMP8891 Co-op Work Term I

COMP8892 Co-op Work Term II

COMP8893 Co-op Work Term III

COMP8894 Co-op Work Term IV

Contemporary Studies Program

Location: University of King's College,
Halifax, Nova Scotia
Telephone: (902) 422-1271
FAX: (902) 423-3357

Acting Co-ordinator
Kenneth Kierans 422-1271

Teaching Staff at the University of King's College:

Kenneth Kierans BA, (McGill), DPhil (Oxon),
Acting Co-ordinator
Other staff to be announced in the 1993-94
academic year.

Teaching Staff at Dalhousie University:
To be announced in the 1993-94 academic
year.

The Contemporary Studies Programme

Our assumptions about the contemporary world are not only changing but becoming increasingly diverse and complex. One way in which we can reasonably try to make sense of our period as a whole is to combine into a single course of study several different disciplines and traditions of enquiry. To this end, Dalhousie University and the University of King's College jointly offer an interdisciplinary Program in Contemporary Studies (CSP). This combined-honours BA Program brings together departmental offerings in arts and the social sciences at Dalhousie and joins them with Contemporary Studies classes—including a required 'core' class for each upper year of study—at King's. The King's portion of this intercampus degree Program consists of integrated and interdisciplinary classes. These classes include specialists from a number of disciplines, involve team-teaching throughout, and are supported by a tutorial system. The intention is to provide students with a many-sided yet unified introduction to the study of the contemporary world.

The interdisciplinary offerings within the CSP at King's count as one of two honours subjects. Contemporary Studies classes are designed so that important writers and artists of the 20th century may be considered both on their own terms and in relation to some of the fundamental themes of our time. This naturally very often involves a consideration of the difference between these writers and artists and those of the 19th century. The three 'core' classes give students a framework for understanding political,

scientific, and aesthetic phenomena in the 20th century. The non-required classes focus on diverse aspects of and explanations for these often contradictory contemporary phenomena.

Aside from preparing undergraduates for future more specialized training at the graduate or professional level, the CSP is intended to provide them with a broad overview of 20th-century culture, especially the European and North American relation to it. Students are encouraged to relate the various aspects of contemporary thought to one another and to develop independent insights into the nature of the world in which they live. It is also hoped that CSP students will take an active role in organizing certain events each year, including lectures, debates, and exhibitions.

Degree Programmes

The departmental offerings within the CSP at Dalhousie include the other honours subject, a number of possible electives, and certain cross-listed classes. The other honours subject must be selected from the following list of Dalhousie departments and Programs: Classics, English, French, German, History, International Development Studies, Music, Philosophy, Political Science, Russian, Sociology and Social Anthropology, Spanish, and Theatre. Electives may be taken in any of the above-mentioned departments and Programs as well as in the following: Comparative Religion, Music, and Women's Studies. In addition, a number of classes in the Dalhousie Faculty of Arts and Social Sciences have been cross-listed with Contemporary Studies, and some Dalhousie faculty members participate in Contemporary Studies classes at King's.

Combined Honours

All students must meet the distribution requirements of the Faculty of Arts and Social Sciences (see regulations 3 and 11.1). Students who are eligible to take an honours degree are urged to apply to the CSP. Because it is an honours programme, the quality of work required in it is higher than that required in a major or an advanced major programme (see regulation 22.1).

Applications for admission must be made to the Dalhousie department concerned and to the Contemporary Studies Office at King's on forms available from the Registrar at either Dalhousie or King's. Students should apply before registering for the second year. If application is made later, it may be necessary to make up some work not previously taken. For each individual student the entire degree programme, including elective classes, is subject to supervision and approval by the Dalhousie department concerned and by a

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member of the Contemporary Studies teaching staff.

All CSP students are encouraged to acquire competence in languages through appropriate classes which are relevant to their degree, interests, and future plans.

The Joint Dalhousie/King's Contemporary Studies programme is based on the general requirement that the 20 full classes needed to graduate include:

- (1) Completion of either the King's Foundation Year programme (either the three- or the four-class version) or at least two appropriate first-year full classes at Dalhousie: *Classics*, CLAS 1000R, CLAS 1010R, CLAS 1021A and CLAS 1022B, CLAS 1100R; *Comparative Religion*, CREL 1000R/2000R; *English*, ENGL 1000R; *History*, HIST 1001A, HIST 1002A/B, HIST 1050R, HIST 1100R HIST 1200R, HIST 1300R, HIST 1400R; *Music*, MUS 1000R, MUS 1350A and MUS 1351B; *Philosophy*, PHIL 1000R, PHIL 1010R; *Political Science*, POL 1100R, POL 1103R, POL 1501R; *Sociology and Social Anthropology*, SSA 1000R, SSA 1050R, SSA 1100R, SSA 1200R; *Spanish*, SPAN 1100A/B; *Mathematics*, 1001A and 1002B.
- (2) A normal requirement (see regulation 11.3) of eleven full classes beyond the 1000-level in the two honours subjects, but not more than seven full classes being in either of them. Students may, with the approval of both the Dalhousie department concerned and the Contemporary Studies teaching staff, elect a maximum of thirteen full classes in the two principal subjects, not more than nine full classes being in either of them. In this case, the requirement in (3) below is reduced to two or three full classes.
- (3) Four full elective classes in subjects other than the two offered to satisfy the general requirement (see regulation 11.3) that students complete fifteen full classes beyond the first year of study.
- (4) The three 'core' classes in Contemporary Studies: CSP 2000R, CSP 3000R, CSP 4000R.
- (5) An honours qualifying examination (see regulation 11.3). At the conclusion of an honours programme a student's record must show a grade which is additional to the grades taken to complete the required 20 full classes. This grade may be obtained through a comprehensive examination, the presentation of a

research paper (which may be an extension of one of the classes), or such other method as may be determined by the Dalhousie department concerned and/or the Contemporary Studies teaching staff. CSP students may choose to acquire this additional grade in either honours subject or in both. Completion of CSP 4200R, as a twenty-first credit, is sufficient to satisfy the requirement for an honours qualifying examination.

Students may take an 'Independent Reading' class only when they reach their third or fourth year. There are six options for this class, but only one full class or the equivalent may be taken in a year. No more than two full classes of this type may be taken during the course of study. The permission of a member of the teaching staff is necessary in order to take these classes, and their availability is strictly limited.

Classes offered at the University of King's College

CSP 2000R Social and Political Development in the 20th Century: In this class, students will consider the development of some of the great social and political movements of our time. There will be some reflection on the 19th-century roots of these movements, but the main emphasis throughout will be on their growth (and decay) in the 20th century. Special attention will be paid to the various schools of contemporary painting and the role of the artist in western industrial societies.

Instructor(s): staff. The instructor for CSP 4000R will participate in this class.

Format: lectures and tutorials.

Prerequisite: either the King's Foundation Year programme or two first-year classes at Dalhousie as indicated above in (1).

Enrolment: 40

CSP 2010R/CSP 3010R/CSP 4010R The Lecture Series: Each year a lecture-series class is offered. Students are allowed to take up to three such classes, one for each year of upper-level study. Each class will consist of thirteen bi-weekly evening lectures given by specialists from Atlantic Canada and beyond. The lecturers will offer students reflections on a number of contemporary issues and themes. Each year a different theme will be explored. For example, a full class could be devoted to modern technology and its often contradictory implications for nature, family life, women, minorities, political structures, literature, drama, and the arts. Small-group

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tutorials will help students prepare for and react to the lectures.

Instructor(s): TBA

Format: bi-weekly evening lectures (two hours) and weekly tutorials (three hours).

Prerequisite: none.

Enrolment: unlimited.

CSP 3000R The History and Philosophy of 20th-Century Science and Technology: One of the most controversial issues of the century is about the value of natural science: is it intrinsically valuable or valuable merely as an instrument for mastering the forces of nature? This class will explore the issue by looking at the ambiguities surrounding contemporary developments in theoretical physics, science-based industry, and the technical control of nature. Emphasis will be put on the diverse schools of contemporary sculpture and architecture which at once presuppose and expand the limits of our scientific-technical culture.

Instructor(s): staff. The instructor of CSP 2000R will participate in this class.

Format: lectures and tutorials.

Prerequisite: CSP 2000R or permission of an instructor.

Enrolment: 40

First offered 1994-95.

CSP 3210A/B Independent Readings in Contemporary Studies: In a reading class the student is assigned to a member of staff for regular meetings to discuss readings in a selected area. Papers and research projects are expected.

Format: individual instruction.

Prerequisite: honours registration in Contemporary Studies or permission of the instructor.

Enrolment: limited.

First offered 1994-95.

CSP 3211A/B Independent Readings in Contemporary Studies: See class description above.

Format: individual instruction.

Prerequisite: honours registration in Contemporary Studies or permission of the instructor.

Enrolment: limited.

First offered 1994-95.

CSP 3215R Independent Readings in Contemporary Studies: See class description above.

Format: individual instruction.

Prerequisite: honours registration in Contemporary Studies or permission of the instructor.

Enrolment: limited.

First offered 1994-95.

CSP 4000R The Deconstruction of the Tradition in the 20th Century: Our century has followed Nietzsche in deepening the 19th-century critique of western culture. In the last century, many Europeans and North Americans believed that by refuting or ignoring traditional metaphysics and religion they could scientifically identify human interests and for the first time realize freedom in the world. Special attention will be paid to the literary and poetic forms in which both traditional culture and scientific critique are supposed to be dissolved.

Instructor(s): staff. The instructors for CSP 2000R and CSP 3000R will participate in this class.

Format: lectures and tutorials.

Prerequisite: CSP 2000R and CSP 3000R or permission of an instructor.

Enrolment: 40

First offered 1995-96.

CSP 4200R Honours Seminar in Contemporary Studies: This seminar is specifically intended for students in the combined-honours degree programme in Contemporary Studies. Students must write a substantial essay on a topic to be chosen in consultation with the appropriate member of the Contemporary Studies teaching staff.

Instructor(s): Staff.

Format: seminar (two or three hours).

Prerequisite: honours registration in Contemporary Studies or permission of the instructor.

Enrolment: limited

First offered 1995-96.

CSP 4210A/B Independent Reading in Contemporary Studies: In a reading class the student is assigned to a member of staff for regular meetings to discuss readings in a selected area. Papers and research projects are expected.

Format: individual instruction.

Prerequisite: honours registration in Contemporary Studies or permission of the instructor.

Enrolment: limited.

First offered 1995-96.

CSP 4211A/B Independent Reading Class in Contemporary Studies: See class description above.

Format: individual instruction.

Prerequisite: honours registration in Contemporary Studies or permission of the instructor.

Enrolment: limited

First offered 1995-96.

CSP 4215R Independent Reading Class in Contemporary Studies: See class description above.

Format: individual instruction.

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Prerequisite: honours registration in
Contemporary Studies or
permission of the instructor.

Enrolment: limited

First offered 1995-96.

**Classes offered at Dalhousie University will
be announced in the 1993-94 academic year.**

Earth Sciences

Location: Life Sciences Centre, Room 3006

Telephone: (902) 494-2358

Fax: (902) 494-8889

Chair-person of Department

P.J.C. Ryall

Undergraduate Advisor

G.K. Muecke (494-8589)

Co-op Co-ordinator

J.M. Hall (494-8510)

Graduate Co-ordinator

P.H. Reynolds (494-2325)

Emeritus Professors

H.B.S. Cooke, MSc, DSc (Witwatersrand)

G.C. Milligan, MSc (Dal), PhD (Harv)

Professors

D.B. Clarke, BSc, MA (Tor), PhD (Edin)

J.M. Hall, BSc (Wales), PhD, DIC (Lond)

R.A. Jamieson, BSc (Dal), PhD, (MUN)

F. Medloll, PhD (Parma)

P.H. Reynolds, BSc (Tor), PhD (UBC), (jointly with Physics)

P.T. Robinson, BSc (Mich), PhD (Calif)

P.E. Sohenk, BSc (Western), MSc, PhD (Wisc)

M. Zentill, 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 (Alta), PhD (Dal)

D.B. Scott, BSc (Washington), PhD (Dal)

Assistant Professors

N. Culshaw, BA (Keele), PhD (Ottawa)

D. Godfray-Smith, BA (Calgary), MA (SFU),

PhD (SFU)

Senior Instructor

P. Wallace, BSc, MSc (McM)

Research Associate

C. Beaumont, PhD (major appointment in Oceanography Department)

Adjunct Professors

F. Gradstein, BA, MSc, PhD (Utrecht)

P. Hacquebard, PhD (Groningen)

P. Mudie, B.Sc. (Capetown), B.Sc.

(Leicester), Ph.D. (Dal), FRSC

M. Salisbury, BSc (MIT), PhD. (Washington)

Introduction

Geology is the science of the Earth and deals with many questions, such as: How was the Earth formed? What is its composition? Where do we look for oil? Or nickel? Or reliable water supplies? What changes the Earth now? What moves continents? Why are the ages of all the ocean basins less than one-twentieth the age of the Earth itself? Geology is an intellectually exciting discipline, and its study is of enormous economic importance to Canada.

Classes in earth sciences are offered for different types of students. Some will want to make a career in some aspect of the study of the Earth — as geologists, geochemists, geophysicists, oceanographers, or teachers — and work for private industry or government agencies. Some may need instruction in earth sciences as an aid to other disciplines: for example, a mining engineer, an environmental scientist interested in groundwater problems, a marine engineer interested in coastal processes, or a biologist interested in protozoa. Other students may be interested in an earth sciences degree before they take a professional qualification such as law or business administration. Those whose prime interest is the humanities or social sciences will find that introductory classes in earth sciences stimulate their awareness of their surroundings, and develop their appreciation of science.

High School Preparation

Students in high schools who plan a career in sciences involving the Earth, such as geology or geophysics, should note that it is sensible to try to have the following subjects in Grades XI and XII: Grade XII Mathematics, plus Chemistry and Physics. Note that these are not prerequisites, but are strongly advised. The student should aim to make up deficiencies in high school preparation in the first year at Dalhousie.

Undergraduate Programmes

Programmes and classes for those whose major is not earth sciences.

These classes are specially designed for those who want to know something about the Earth, but whose major field of study at Dalhousie will lie elsewhere; an economics student, concerned with resources; a history student, interested in the role played by Canada's geological framework in the development of transportation; a biology student interested in faunal environments on the seafloor. These classes are:

- ESCI 1040A/1050B, *The Earth and Society*, a class especially designed for students not intending to major in geology
- SCI 1200R, *An Overview of the Cosmos, Earth and Life*, an interdisciplinary science class designed for non-science majors
- ESCI 2400A, *Marine Geology*, an evening class open to all with good grades in 1000R or 1040A/1050B
- ESCI 2410B, *Environmental Geology*, an evening class, open to all with good grades in 1000R or 1040A/1050B

For engineering students and science students in other disciplines

Biologists: 1000R, 2410B/3410B, 2201A/2202B; **Chemists:** 1000R, 2101A/2102B, 3010A, 3020B, 4380A; **Physicists and Mathematicians:** 1000R, 2050B, 3130B, 4270A, 4280B; and 4290B.

Field Work

Field excursions are part of several classes and are conducted at appropriate times during the session. In addition, some optional field excursions may be held each year.

Students are charged a contribution towards the cost of all field excursions. Charges for those trips that are held during the session, as part of a class, are payable to the department. As a result of increased costs and uncertainty of external funding, fees for individual field excursions are fixed yearly. (Please consult Department.) The charges for optional field trips are notified, and payable, several months in advance. Overpayments, in excess of \$5.00, are reimbursed to the student.

Honours Degree Programmes

An honours degree is almost essential for any professional work in earth sciences, and for graduate study. Students must take the second and third year classes of the Earth Sciences core programme listed below.

Year I will normally consist of:

ESCI 1000R or 1040A/1001B; Mathematics 1000A/1010B or 1500; one class in two of Physics, Chemistry or Biology. Recommended classes are: Physics 1100R, Chemistry 1100R, Biology 1000R or 2001A/2002B; an elective (normally selected to meet the Faculty Writing Requirement).

Note: Physics 1100R and a Mathematics class are prerequisites for ESCI 2050B, which fits best into Year II of the programme.

Year II will normally consist of:

1. ESCI 2050B, 2101A/2102B, 2110A, 2201A/2202B

2. One class in two of Physics, Chemistry, Biology, Mathematics. Recommended classes are: Biology 2001A and 2002B, 3321; Chemistry 2110A or B, 2200A or B, 2310A, 2320B; Physics 2000A, 2005A, 2010B, 2015B, or 2220A/2230B; Mathematics 2000, 1060A/1070B, 2270A or B.
3. Attendance at an approved field school (ESCI 0001).

Year III will normally consist of:

1. ESCI 3010A, 3020B, 3140A, 3301A/3302B
2. One class in Physics, Chemistry, Biology or Mathematics; and an elective.
3. Students in the geophysics stream will take ESCI 3130B. This class has a field school, which is an integral part of the course. It is normally held in late April or early May.
4. Attendance at the honours field trip (ESCI 0002) just prior to the beginning of Year IV.

Year IV will normally consist of:

1. ESCI 4200R, 4350A, other 4000 level classes in Earth Sciences; and an elective.
2. To satisfy Regulation 11.5 concerning the Honours Qualifying Examination, a student will complete a thesis as ESCI 4200R, followed by an oral examination, based on the general subject area of the thesis. This oral examination then counts as the honours qualifying examination.
3. Theses must be completed by the second Monday in March of fourth year. Students who complete after this date must re-register for the following academic year in ESCI 4200R, pay the fees, and graduate at the spring convocation of the next academic year.

Students registered in the Faculty of Science, should take note that they must achieve a cumulative GPA 3.0 or better in their advanced classes, in order to continue and graduate from the Honours programme.

Each advanced class in the second, third and fourth year, except electives, must be passed with a grade of C or better.

In five of the advanced classes, a grade of B or better must be achieved, and in three additional advanced classes, a grade of B— or better is required.

A grade of B— or better must be achieved on the Honours Qualifying Examination.

For First Class Honours, students must achieve either:

- a. Grades of A or better in four advanced classes and of A- or better in four additional advanced classes, or

- b. Grades of A or better in six advanced classes and of B or better in all advanced classes.

A grade of A- or better must be achieved on the Honours Qualifying Examination.

Co-op Programme

A co-op programme is offered by the department, providing students with an opportunity to gain practical work experience concurrently with their academic training. The student is expected to fulfil the normal twenty-credit requirement of an honours degree or advanced major, over eight academic terms that are interspersed with four work terms. A minimum average of B is required for entrance to the programme. The programme commences in the spring term of the second year. Interested students should consult with the department prior to that time.

Hydrogeology/Environmental Geology

In addition to the above programme, the Department offers special programmes emphasizing hydrogeology/environmental geology in the third and fourth year. Students interested in specializing in these areas should consult with the Undergraduate Advisor.

Honours Marine Geology Stream Programme

Students wishing to obtain an honours BSc degree in the marine geology stream should discuss their programme with the undergraduate advisor and classes will normally include:

- Year I:** ESCI 1000R, MATH 1000A/1010B, PHYC. 1100R, CHEM. 1010R, and WRITING Requirement elective
- Year II:** OCEA 2850R, ESCI 2101A, ESCI 2102B, ESCI 2201A, ESCI 2202B, ESCI 2110A, Social Science Elective, COMP 1000B
- Year III:** ESCI 0001, ESCI 3010A, ESCI 3301A, ESCI 3140A, ESCI 3400A, ESCI 3410B, ESCI 3302B, ESCI 3020B, ESCI 2050B, Elective
- Year IV:** ESCI 4200R, ESCI 0002, ESCI 4501A, ESCI 4350A, ESCI 4351B, plus 1 1/2 credit from ESCI 4000-level courses (ESCI 4270A/4280B, 4290A, 4501A or B, 4502A or B, 4503A or B, 4510 A) (and 1-credit from Oceanography, OCEA 4110B, 4120A, 4130A, 4150A, 4280A)

Students must attend the field school normally taken at the end of second year (ESCI 0001).

Combined Honours with Biology

Earth Sciences Honours Programme should be followed during Years I-III and students should take either a Biology class or ESCI 4501A or B or 4502 A or B or 4503A or B in place of ESCI 3010A/3020B. Suggested Biology classes are 1000 or 2001A and 2002B in Year I; 2030A and 3030B and 2080A or B in Year II; 2001A and 2002B or 3321 or 3323 in Year III.

Combined Honours with Physics

Students should follow the Earth Sciences Honours Programme in years I to III, including ESCI 2050B and ESCI 3130B, but should take a Physics class in place of ESCI 3010A/3020B. Suggested Physics classes are 1100R in Year I, 2000A, 2005A, 2010B, 2015B in Year II, two of 3090B, 3140A or 3000A/3010B or 3200A/3210B and 3180A/3170B in Year III. Math 2000 should also be taken in either Year II or III, and Math 3110A/3120B in Year III or IV.

Combined Honours with Chemistry

Students should follow the Earth Sciences Honours Programme in Years I-III, but should take 3000 level Chemistry classes in place of ESCI 3301A/3302B and 2050B/3130B. Suggested Chemistry classes are 1010 in Year I, 2201A or B/2101A or B and 2301A/2302B or 2400 in Year II; any 3000 level in Year III.

Advanced Major (20-credits)

The programme for an Advanced Major degree in Earth Sciences requires four years to complete. Its requirements include those of the 15-credit programme (below) plus the following:

1. Twelve of twenty credits taken must be beyond the 1000 level.
2. Six to nine of the classes beyond the 1000 level must be in the major area, and three of these at the 3000 level or above.
3. Students are required to earn a minimum of 16 merit points for this degree.
4. Students in this programme are required to attend an approved field school, (ESCI 0001).

A grade of D in an Earth Sciences class precludes admission to classes for which the class is a prerequisite. Where several classes are listed as prerequisites, and a grade of C- or better was not obtained in all, the instructor's consent maybe the basis for admission. Students must satisfy the Faculty of Science Writing Requirement and Mathematics Requirement.

Combined Honours Programme

Students wishing to take combined honours in earth sciences and another subject, should discuss their programme in detail with the undergraduate advisor.

Major Programme (15-credits)

Three-year programmes with a major in Earth Sciences are suitable for students who intend to take other professional training or to enter fields where they are likely to need their geological training as background. A 15-credit degree is of little value as a qualification for a professional career in the earth sciences.

Year I will normally include:

ESCI 1000R or 1040A/1001B and four other classes. One programme recommended for students undertaking a 15-credit BSc with a major in Earth Sciences is the first three years of the concentrated honours programme (see above). ESCI 1000R or 1040A/1001B must be passed with a grade of B— or better to continue in the programme.

Years II and III must include:

1. ESCI 2101A/2102B, 2110A, 2201A/2202B, 2050B, 3010A, 3020B, 3140A, 3301A, 3302B.
2. Participation in an approved field school (ESCI 0001). Normally this is taken at the end of second year.

A grade of D in an Earth Sciences class precludes admission to classes for which the class is a prerequisite. Students must satisfy the Faculty of Science Writing Requirement and Mathematics Requirement.

Classes Offered

ESCI 1000R - Introduction to Geology: An introductory class for students who plan to take a degree in earth sciences, or in another science, or in engineering. The lecture material covers the whole field of geology including the origin of the solar system, earth history, geological time, ocean basin formation, mountain formation, volcanoes, continental drift, natural resources such as metals and petroleum, and environmental pollution. The laboratory component involves work with minerals, rocks, fossils, and geological maps as well as a number of field excursions to observe local geological features. Students who wish to major in Earth Sciences but have unresolvable scheduling conflicts with ESCI 1000R should consult the undergraduate advisor.

Instructors: N. Culehaw/F. Medloll
Format: Lectures/Field trips/
 Laboratories

Exclusion: Credit will be given for only one of ESCI 1000, 1040A/1050B, or 1040A/1001B.

ESCI 1001B - Beginning Geology: This course is intended primarily for students

intending to major in earth sciences.

Lectures will cover the classification of Earth materials (minerals, rocks, fossils) and the operation of Earth processes (erosion, deposition, volcanism, metamorphism, earthquakes). They will also deal with the internal structure of the Earth (core, mantle, crust), and the many expressions of plate tectonics (mountain ranges, rift valleys, fracture zones, ocean basins, mid-ocean ridges). Laboratories involve work with minerals, rocks, fossils, and geological maps.

Instructors: staff

Format: Lectures/Laboratories

Prerequisite: ESCI 1040A

Exclusion: Credit will be given for only one of ESCI 1000, 1040A/1050B, or 1040A/1001B.

ESCI 1040A or B/1050A or B - The Earth and Society: These classes are designed for non-Earth Sciences majors. Previous Mathematics, Physics, or Chemistry are not required. These courses do not include formal labs, but 1040A includes three field trips, and some assignments are done in a laboratory environment. ESCI 1040A provides an introduction to some basic concepts about the Earth, including the Earth as a planet, geological time, evolution and extinctions, plate tectonics, and the evolution of the Earth's crust. ESCI 1050B applies the concepts learned in 1040A to understanding how geology affects society. Topics covered include mineral and energy resources, geological catastrophes, geology and landscape of Nova Scotia, and global climate change. ESCI 1040A is a prerequisite. Students with good grades in 1040A may enter ESCI 1001B.

Instructors: D.I. Godfrey-Smith/F. Medloll/
 P.J.C. Ryall

Format: Lectures/Field trips

Exclusion: Credit will be given for only one of ESCI 1000, 1040A/1050B, or 1040A/1001B.

SCI 1200R: Science for Non-Science Students: An Overview of the Cosmos, Earth, and Life: The class meets the science distribution requirement for BA students. There are no prerequisites and the class does not count as a prerequisite for any other science class. Students are introduced to selected concepts central to each of the disciplines of Geology, Biology, and Physics, and the origins of our universe, Earth and life on Earth. Emphasis is placed on developing an understanding of the scientific method, its limitations, and its application in society. The principles will be related to environmental concerns. For example the properties of light and radiation are applied to a discussion of global warming. The principles involved in

ocean and atmospheric circulation are used to understand present problems of climate and pollution. Biological principles are applied to understand the consequences of changing habitats on biodiversity.

Instructors: E. Angelopoulos, P. Reynolds, R. Marsh

Cross-listings: ESCI 1200R, PHYS 1200R, BIOL 1200R

ESCI 2050B - Principles of Geophysics:

Geophysical methods are increasingly important in land- and sea-based geological studies. Understanding the principles of the various techniques (seismics, gravity, magnetics) their powers, and limitations, provides a foundation for later more practical classes.

Instructor: P.J.C. Ryall

Format: Lecture 3 hours/ Tutorial 2 hours

Prerequisites: a first year class in Mathematics and Physics 1100R

ESCI 2101A - Mineralogy and

Crystallography: This class deals with the way in which the chemical components of rocks are organized into specific crystalline compounds (minerals). The lectures cover the crystallographic principles which determine the regular internal and external structure of minerals (crystallography), the relationship between mineral composition and structure (crystal chemistry) and the interaction of polarized light with crystals (optics). The labs involve hand specimen identification of minerals based on their physical properties and associations with other minerals in rocks.

Instructor: P. Robinson

Format: Lecture 3 hours/ Laboratory 3 hours

Prerequisites: ESCI 1000R or ESCI 1040A and ESCI 1001B

ESCI 2102B - Introduction to Petrography

and Petrology: In this course we deal with the ways in which minerals interact with melts, solutions and each other to form rocks. Such topics as phase equilibria, solution chemistry and solid-solid reactions will be covered in the lectures as will the basic principles of rock classification based on textures and mineralogical compositions. The labs will emphasize optical identification of minerals and rocks using the petrographic microscope.

Instructor: P. Robinson

Format: Lecture 3 hours/ Laboratory 3 hours

Prerequisites: ESCI 2101A

ESCI 2110A - Field Methods:

This is intended as an introduction to field techniques useful to the practicing geologist, particularly those concepts essential for the

accurate field description and identification of rocks and the use and construction of geological maps. Geophysical field techniques and elementary structural geology are also considered.

Instructor: N. Culshaw

Format: Lecture 3 hours/ Laboratory 3 hours/ Field trips

Prerequisites: ESCI 1000R or ESCI 1040A and ESCI 1001B

ESCI 2201A - Stratigraphy: We deal with the principles by which we interpret the history of the Earth. Topics include measurement of geologic time, origin of the Earth, construction of mountains, organic evolution, and sedimentary environments. Laboratories give practice in using these principles to interpret Earth history.

Instructor: P.E. Schenk

Format: Lecture 3 hours/ Laboratory 3 hours

Prerequisites: ESCI 1000R or ESCI 1040A and ESCI 1001B

ESCI 2202B - Earth and Life Through Time:

This course deals with many of the important events that have occurred to produce our present physical and organic Earth. These events include early attempts to create organisms, the separation and collision of continents, the changing character of life, and the times of great extinctions. A survey of paleontology and paleoecology is given in the laboratories.

Instructor: P.E. Schenk

Format: Lecture 3 hours/ Laboratory 3 hours

Prerequisites: ESCI 2201A or ESCI 1040A and Biology 1000

ESCI 2400A - Marine Geology: The ocean basins make up nearly three quarters of the Earth's surface and are the loci of many active geologic processes. This course deals with the morphology and tectonic history of the ocean basins, the lithology and geophysical characteristics of oceanic lithosphere and the nature and distribution of marine sediments. Important processes such as oceanic volcanism, hydrothermal circulation, sea floor spreading and marine sedimentation will be discussed, as will environmental, legal and economic aspects of the marine environment. The course is designed to provide an introduction to marine geology for non-earth sciences majors wishing to learn more about geology and for those who plan to take a degree in earth sciences. This class is not recommended for earth sciences honours students.

Instructor: P. Robinson

Format: Lecture/Laboratory 3 hours, one evening per week

Prerequisites: any first year class in earth sciences

ESCI 2410B - Environmental and Resource Geology: Geology lies behind many of the environmental problems facing humanity today. In this class we consider topics such as energy and mineral resources, geological hazards such as earthquakes, landslides, and volcanic eruptions, the relevance of geology in the fields of foundation engineering, pollution and waste disposal, and the role that geology has to play in planning urban areas, especially in Nova Scotia. This class is not recommended for earth sciences honours students who should take ESCI 3410B.

Instructor: staff
Format: Lecture/Laboratory 3 hours, one evening per week
Prerequisites: ESCI 1000R or ESCI 1040A and 1050B or 1001B

ESCI 0001A - Field School: The course provides ten days of training in geological field methods. A wide range of rock types are examined in the field, and are described using traverses, measured sections, and outcrop and structural maps. An individual field mapping project forms part of the course. For students taking combined honours with Physics, participation in the geophysics field school (part of ESCI 3130B) is considered equivalent. Although the field school is a non-credit class, it appears on transcripts and is a compulsory part of the earth sciences programme.

SCI 3000R - Science Fundamentals: An interdisciplinary class that stresses the motivations, methodologies, and responsibilities of scientists, and provides extensive formal instruction in written and oral communication of scientific material. For details, see main calendar entry "Science, interdisciplinary." The status of this class (elective, minor, or major credit) varies from department to department; check with your undergraduate advisor.

ESCI 3010A - Igneous Petrology: The study of the field relations, mineralogy, texture, and geochemistry of volcanic and plutonic rocks. Lectures discuss the classification, graphical representation, means of production, differentiation, and emplacement of igneous rocks, and their grouping into co-magmatic provinces. Labs involve using the petrographic microscope to determine the crystallization history of igneous rocks through their mineralogy and texture.

Instructor: staff
Format: Lecture 3 hours/ Laboratory 3 hours
Prerequisite: ESCI 2101A/2102B

ESCI 3020B - Metamorphic Petrology: Metamorphic petrology is the study of the way in which pre-existing igneous, sedimentary, and metamorphic rocks respond to changes in pressure, temperature, and

geochemical environment. Metamorphic reactions, deformation and recrystallization, the stability relations of minerals and mineral assemblages under various physical and chemical conditions, and the concept of metamorphic facies are discussed. In the labs, microscopic mineralogy and texture are used to decipher the metamorphic history of rocks.

Instructor: R.A. Jamieson
Format: Lecture 3 hours/ Laboratory 3 hours
Prerequisites: ESCI 2101A/2102B, ESCI 3010A.

ESCI 3140A - Structural Geology: An introduction to the behaviour of rocks during deformation, stressing the geometrical aspects of rock structures on the scale normally encountered by the exploration geologist, and their interpretation. The laboratory exercises in the construction and interpretation of geological maps develop skill in the interpretation and graphical representation of structures in three dimensions.

Instructor: N. Culehaw
Format: Lecture 3 hours/ Laboratory 3 hours
Prerequisites: ESCI 2101A/2102B, ESCI 2110A, ESCI 2201A/2202B

ESCI 3301A - Sediments and Sedimentary Rocks: The course deals with physical and biological processes which generate modern siliciclastic, carbonate and evaporite sediments. Materials associated with Quaternary glacial events are discussed. The formation of sedimentary rocks is examined and their petrology illustrated using laboratory techniques. Weekend field trips to selected modern and ancient sedimentary deposits in Nova Scotia take place in the first month of classes.

Instructor: M.R. Gibling
Format: Lecture 3 hours/ Laboratory 3 hours
Prerequisites: ESCI 2201A and 2202B

ESCI 3302B - Quaternary Sedimentary Environments: The course deals with facies models for Quaternary glacial, coastal, deep sea and alluvial sediment. Emphasis is placed on sedimentation processes typical of each depositional setting and the geometry of the resulting deposits. Ancient deposits, including those resulting from glacial events, are examined, and their association with hydrocarbons, coal and sedimentary ores discussed. The labs provide practical experience of techniques used in facies analysis.

Instructor: D.B. Scott
Format: Lecture 3 hours/ Laboratory 3 hours
Prerequisite: ESCI 3301A

ESCI 3400A - Fundamentals of Hydrogeology: The availability of clean water is absolutely essential for the development and maintenance of modern societies. This course will deal with the mathematical description of groundwater movement, geophysical and geological methods for groundwater exploration, regional occurrence and chemical quality of groundwater, and the effects of waste disposal on chemical quality. Laboratory work stresses familiarity with techniques employed in the assessment and exploration of groundwater resources, as well as the analysis and interpretation of water quality data.

Instructor: G.K. Muecke/J. Hall/P.J.C. Ryall

Format: Lecture 3 hours/ Laboratory 3 hours

Prerequisites: ESCI 2201A, 2101A, 2102B

ESCI 3402B - Practical Hydrogeology: This class is designed to build on Geology 3400A to familiarize the student with the practical aspects of groundwater resources development and monitoring system installation, including drilling methods, well design, well hydraulics and aquifer analysis, slug testing, data interpretation, and introduction to groundwater modelling.

Actual case history data and problem assignments with practical applications will be emphasized.

Instructor: Staff

Format: Lecture 3 hours

Prerequisites: ESCI 3400A

ESCI 3410B - Enhanced Environmental Geology: The topics treated in this course are similar to Geology 2410B, but they will be discussed at considerably greater depth during an additional 3 hours lab / tutorial per week. Credit will be given for only one of ESCI 2410B or 3410B.

Instructor: G.K. Muecke

Format: Lecture 3 hours/ Laboratory 3 hours

Prerequisites: ESCI 2201A and 2202B, 3400A, 2101A/2102B

ESCI 0002A - Advanced Field School: The class is a field excursion of 7 to 14 days duration which is designed to give the student a regional perspective of Appalachian geology, including metamorphic terranes, igneous intrusions and sedimentary basins of Precambrian to Mesozoic age. Classic field localities in eastern North America will be visited. Exceptionally, a more distant location may be selected. It appears on transcripts and is compulsory for all Honours students.

ESCI 4084C - Pleistocene Biogeography: Lecture, discussion, and laboratory experience in the reconstruction of environmental change during the Pleistocene epoch. Laboratory and field experience pay

particular attention to the environmental history of the Maritime region, including environmental changes caused by man. Techniques of pollen and diatom analysis, plant and animal macrofossil study, dendrochronology, geochemical and isotopic dating methods are explored. Field and laboratory work include a class problem in an area in the Halifax region.

Instructor: J.G. Ogden III

Format: Laboratory 3 hours

Prerequisites: 2 credits in Geology or Biology. Cross Listing: BIOL 4084C

ESCI 4151A or B - Mineral Deposits: This class is an introduction to the geology of metallic ore deposits (e.g. gold, copper, zinc, lead, platinum-group elements, the rare earths, uranium, etc.) and some industrial mineral concentrations (e.g. asbestos, barite). Emphasis is given to the diverse geological processes of ore formation within different geological environments, such as the ocean floors, sedimentary basins, continental rifts, island arcs and Andean type continental margins. It also acquaints the student with principles of mineral exploration, assessment, exploitation, and environmental problems related to mining. The class integrates many Earth Science disciplines, and requires extensive reading, writing, and the oral presentation or seminars.

Instructors: M. Zentilli

Format: Lecture 3 hours

ESCI 3301A/3302B

ESCI 4152A or B - Fossil Fuels: The class provides an introduction to the principal fossil fuels: peat and coal, oil shale, oil and natural gas, and uranium. We will discuss the chemical nature of each type of fuel, as well as biological and physicochemical factors involved in its genesis and concentration within the earth. The class will also consider practical methods used in resource evaluation and geological and geopolitical factors that make extraction of raw fuel feasible. Economically important deposits in Canada and worldwide will be discussed.

Instructors: M. Gibling/P. Haquebard

Format: Lecture 3 hours

Prerequisites: ESCI 3301A/3302B

ESCI 4200R - Honours Thesis: This class deals with many aspects of written and oral communication of scientific and technical material. In particular, it covers the elements of scientific style (clarity, precision, conciseness, and objectivity), the logical organization and development of ideas and arguments, and the acceptable formats for scientific writing. Some attention will also be given to techniques of oral presentation. This is a compulsory class for students writing an Honours thesis in Earth Sciences, but it is

open to students from other disciplines.

Text: H.M. Weisman, Basic Technical Writing.

Instructor: D.B. Clarke

Format: Lecture 2 hours

ESCI 4270A - Applied Geophysics: The application of geophysical methods to petroleum and mineral exploration as introduced in 2050B and 3130B is here treated at a more advanced level.

Assignments attempt to involve the student in interpretation of realistic geophysical data.

Instructor: P. Ryall

Format: Lecture 3 hours

Prerequisites: ESCI 2050B, ESCI 3130B or instructor's consent

ESCI 4280B - Marine Geophysics: The application of the various geophysical techniques to the study of the sea floor and the principal results obtained are examined. The processes involved in the creation, evolution and destruction of ocean basins and the implications of the experimental observations are also considered. This class is not offered every year.

Instructor: K. Loudon

Format: Lecture 3 hours/ Laboratory

Prerequisites: ESCI 2050B, ESCI 3130B, ESCI 4270A or instructor's consent

ESCI 4290A - Geodynamics: Essential for earth sciences or physics students who intend to be geophysicists, the class covers the physical state and behaviour of the Earth as a whole. This class is not offered every year.

Instructor: C. Beaumont

Format: Lecture 3 hours

Prerequisites: ESCI 2050B, ESCI 3130B, ESCI 4270A or instructor's consent.

Cross-listing: ESCI 5290A or B, OCEA 5450A or B

ESCI 4350A - Tectonics: This is a required class for Earth Sciences Honours Students. It is intended to introduce students to current research areas in large scale processes in geology. Study of these processes draws on all fields of geology and geophysics. The process studies change as research interests change internationally. Currently three processes are considered. There are, firstly, recent advances in understanding of the Alpine-Himalayan compressional belt, involving such features as lateral extrusion and secondary extension. Secondly, new models for sedimentary basin formation as described, using the North Sea and the margins of the North Atlantic as examples. Lastly, new results on the continental crust, particularly those derived from deep reflection seismics, are described.

Instructor: J.M. Hall

Format: Lecture 3 hours

Prerequisites: All third year Geology core courses

ESCI 4351B - Canadian Regional Tectonics:

This course is intended to synthesize the various aspects of geology treated in more specialized courses through an analysis of those processes which have shaped some of the major Canadian geological regions. We will examine the structure, stratigraphy and petrology of mountain belts (Cordillera, Appalachians), Precambrian shield (Grenville, Churchill, Superior), and sedimentary basins (East Coast shelf, Western Canada, Sverdrup) in order to determine what processes, including plate tectonic processes, created them.

Instructor: N. Culehaw/M. Gibling

Format: Lecture 3 hours

Prerequisite: ESCI 4350A

ESCI 4380A - Advanced Geochemistry:

Principles of crystal chemistry, isotope fractionation, thermodynamics and solution chemistry are applied to the investigation of hydrothermal solutions, as well as ground- and surface waters. Geochemical aspects of ore formation, the exploration for economic mineral deposits, and environmental pollution are covered. Geochemical surveys, element dispersion in the near-surface environment, and the origin and evaluation of geochemical anomalies are also discussed. In the laboratory statistical methods of geochemical data processing are introduced using micro-computers.

Instructor: D.B. Clarke

Format: Lecture 3 hours/ Laboratory 3 hours

Prerequisites: ESCI 3010A, ESCI 3020B

ESCI 4390A or B - Advanced Igneous Petrogenesis:

Igneous rocks have an extremely large compositional range. Their only common characteristic is their former existence as magmas. This course is devoted to understanding the principles, and using the tools, of igneous petrogenesis to learn how the combination of a few dominant source rocks, and a rich variety of processes, can account for the compositional diversity of igneous rocks. Examples from divergent plate margins will include mid-ocean ridge basalts, oceanic island basalts, plagiogranites, and ophiolite suites in general; examples from convergent plate margins will include island arc tholeiites, and especially continental arc volcanic and plutonic suites (including granitoid rocks); and examples from within-plate tectonic settings will include magmatic rocks such as kimberlites, carbonatites, and anorogenic granites and rhyolites. This class is offered in alternate years.

Text: P.C. Hess, *Origins of Igneous Rocks*.
Instructor: D.B. Clarke
Format: Lecture 3 hours
Prerequisites: ESCI 3010A, ESCI 3020B

ESCI 4400B - Advanced Metamorphic Petrology: Metamorphic rocks are considered as equilibrium systems. The role of fluids in metamorphism, metasomatism and mass transport, kinetics of metamorphic processes, microstructure, and textural development of metamorphic rocks are discussed. Laboratory projects and special topics are chosen to suit the students' interests. This class is offered in alternate years.

Instructor: R.A. Jamieson
Format: Lecture 3 hours
Prerequisites: ESCI 3010A, ESCI 3020B

ESCI 4501A or B - Basin Analysis: The course is designed to present advanced topics of current interest concerning regional and global patterns of sediment accumulation. Topics may include: sequence stratigraphy and continental margin evolution; stratigraphic and geochemical methods used in analysis of burial history; paleo flow patterns; and basin geology in the context of plate-tectonic theory. This class is not offered every year—consult department.

Instructor: staff
Format: Lecture 3 hours
Prerequisites: ESCI 3301A/3302B

ESCI 4502A or B - Micropaleontology and Global Change: This class provides a systematic study of major groups of microfossils (principally foraminifera, ostracods and calcareous nanoplankton). Particular emphasis is placed on the distribution and ecology of recent microfossils, and on laboratory techniques for sampling and studying them. Quaternary paleo-oceanography and faunal distribution is examined based on knowledge of the tolerances of the living organisms.

Instructor: D.B. Scott
Format: Lecture 3 hours/ Laboratory 3 hours
Prerequisites: ESCI 3301A/3302B

ESCI 4503A or B - Carbonate and Evaporite Petrology: This course deals with carbonate and evaporite depositional and diagenetic environments. Modern environments are surveyed from the deep sea to tidal flat and playa settings. Changes to these records and especially the development of porosity are considered in the second half. This class is not offered every year; consult timetable.

Instructor: P.E. Schenk
Format: Lecture 3 hours/
 Laboratories/Seminars 3 hours
Prerequisites: ESCI 3301A/3301B

ESCI 4510A/4511B - Directed Reading: This class is intended to permit further study of a specific topic of interest, or to correct a deficiency in a student's programme.

Instructors: Staff
Format: As required
Prerequisite: Permission of Department

ESCI 8700 A or B (non-credit) - Co-op Seminar

ESCI 8891R - Co-op Work Term I

ESCI 8892R - Co-op Work Term II

ESCI 8893R - Co-op Work Term III

ESCI 8894R - Co-op Work Term IV

Seminars

Department seminars are arranged during the term. Other specialized seminars are arranged on an ad hoc basis.

Graduate Classes

Some graduate classes may be suitable. Please consult the Graduate Calendar and seek advice from the Department.

Economics

Location: 6206, 6214 and 6220
University Ave.

Administrative
Offices: 6214 University Ave.
Telephone: (902) 494-2028

Chairperson of Department

E. Klein

Faculty Advisors

Michael Bradfield, Undergraduate Coordinator
Melvin Cross, Graduate Coordinator
Barry Lesser, MDE Coordinator

Emeritus Professor

Z.A. Koncezacki, BSc (Lond), B.Econ.Hons
(Natal), PhD (Lond)

Professors

F.M. Bradfield, BComm (McM), PhD (Brown)
J.L. Cornwell, BA (Iowa), MSc (Lond), PhD
(Harv), McCulloch Professor of Economics
S. DasGupta, BA (Calcutta), MA (Delhi), MA,
PhD (Rochester)
E. Klein, LL.M. (Buenos Aires), MSc (Dal),
Dr.Rer.Pol. (Hamburg)
C.T. Marfels, Dr.Rer.Pol. (Berlin)
R.I. McAllester, MA (Oxon), MA (Cantab)
L. Osberg, BA Hons (Queen's), MPhil, PhD
(Yale)
U.L.G. Rao, MA, MSc (Andhra), PhD
(Western)
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Associate Professors

M.L. Cross, AA (Dawson College), BA
(Montana), MA (SFU), PhD (Texas A&M)
D. Gordon, BA (Lethbridge), MA
(Saskatchewan), PhD (UBC)
F.B. Huber, BA, MA, PhD (Yale)
B. Lesser, BComm (Dal), MA, PhD (Corn)
R.L. Mazany, BSFS (Georgetown), PhD (UBC)
S.A. Phipps, BA Hons (Victoria), MA, PhD
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Assistant Professors

P. Burton, BSc (Saskatchewan), MA, PhD
(UBC)
A. Mansourian, BSc (London School of Econ),
MA (McM), PhD (Queen's)
N. Sharif, BA (Punjab), MA (Dacca), MA, PhD
(McM)

Special Lecturer

T.A. Pinfeld, BA, MA (Western), PhD (Minn)

Introduction

Economics is a social science — a science because it involves a rigorous intellectual effort to derive logical conclusions from basic facts and propositions; a social science because it has human beings and their welfare as its ultimate concern. The basic facts of Economics cannot be knowable and measurable with the same precision as those of the physical sciences — human society and its motivations are far too complex to permit this — but none of the sciences surpasses economics in its relevance to our needs, problems and goals.

Economic man is rational man consuming, organizing and producing within a framework of laws and customs in an effort to use the limited resources of our world efficiently for the greatest satisfaction. It is not an easy science; indeed it is one of the most complex, difficult (and fascinating) areas of study you could choose in the university when you pursue it beyond its elementary levels, but some basic knowledge of economics is essential for any educated person. A more extensive knowledge of the subject is an invaluable complement to other fields of specialization such as law, commerce, politics and other studies in social sciences or humanities, and a specialization in the field can lead to a variety of interesting career opportunities.

Degree Programmes

The department offers both BA and BSc degree programmes which are described below. A student may graduate with either a BA or a BSc degree but not both. In all programmes the student must ensure that the courses selected satisfy the overall faculty requirements for the relevant general degree (BA or BSc).

General Principles

The following programme arrangements are provided to the students as guidelines to facilitate the selection of classes appropriate to particular areas of interest. They should not, however, be construed as straitjackets nor as a reason for not seeking individual guidance from faculty members. In suggesting such programme frameworks, two principles have particular weight: (a) students taking economics as a major, or in an honours programme, should strike a balance between breadth of coverage among disciplines and depth of specialization in economics; (b) students taking economics as a minor or as a component of another specialization, such as commerce, should be allowed a reasonable degree of flexibility in their choice of economics classes.

BA Honours Degree Programme (Four Years)

Undergraduate Coordinator: M. Bradfield (Tel: 494-6989)

Requirements:

1. Minimum total number of credits required in Economics (see also note 4 below) beyond the 1000 level: nine (this includes core classes, see 2 below).
2. Core classes in Economics: Economics 1100; 2200A or B (or equivalent), 2201A/B (or equivalent), 2260A and 2280B; either 2232, or 2238A and 2239B; 3338A; 3347A/B; 3348A/B, 4100C, 4420B, 4421A.
3. Classes in Mathematics: Mathematics 1000A/B; 2030A or equivalent.
4. An honours essay graded on a pass/fail basis.

BSc Honours Degree Programme (Four Years)

Undergraduate Coordinator: M. Bradfield (Tel: 494-6989)

Requirements:

1. Minimum total number of credits required in Economics (see also note 4 below) beyond the 1000 level: nine (this includes core classes, see 2 below).
2. Core classes in Economics: Economics 1100; 2200A/B (or equivalent), 2201A/B (or equivalent), 2260A and 2280B; either 2232 or 2238A and 2239B; 3338A; 3347A/B; 3348A/B, 4100C, 4420B, 4421A.
3. Classes in Mathematics: Mathematics 1000A/B; 1010B; 2030A or equivalent.
4. An honours essay graded on a pass/fail basis.

Notes:

1. Classes selected (outside of economics) in the third and fourth year must include at least two classes above the 1000 level.
2. The student's programme is chosen in consultation with the department and must have approval of the department.
3. Students must arrange their courses to ensure that they satisfy the overall requirements for the 15-credit BSc degree.
4. Since mathematics is required for graduate work in most good graduate schools, the value of econometrics and of additional mathematics is stressed. In some instances, the department may permit students to take classes in other subjects in lieu of classes in Economics and may permit minor variations in the required classes.

Combined Honours

Combined honours programmes, BA or BSc, may be arranged with other departments such as Biology, Geology, History, Mathematics, Political Science, Sociology, etc. For combined honours programmes with Economics, students also should consult the other departments concerned.

BSc Advanced Major Programme (Four Years)

Requirements:

1. Total of twenty credits that meet the requirements in regulation 11.3.
2. Economics 2200A/B (or equivalent), Economics 2201A/B (or equivalent), 2260A and 2280B, 3338A.
3. Math 1000A/B, 1010B, 2030A/B.

A student who wants to have the option of later converting an advanced major to an honours degree should select classes in accordance with the list of core classes given above and should consult regulations 11.4 and 22. Besides additional core classes, the honours programme requires an honours essay and a higher academic standing than the advanced major. An honours programme can be converted to an advanced major at the student's discretion. The advanced major does, however, allow a maximum of only nine credits in economics while the honours programme allows a maximum of eleven.

BA Advanced Major Programme (Four Years)

An advanced major (BA) is available in economics. This program requires a total of twenty credits that meet the requirements given in regulation 11.3. In addition to those requirements, the twenty credits offered for an advanced major in economics (BA) must include Economics 2200A/B and Economics 2201A/B.

While the total number of credits required for the advanced major is the same as for an honours degree, the honours program in economics requires an honours essay and must include a core of classes in economics as given above. In addition, the honours program requires a higher academic standing than does the advanced major. However, the advanced major program does offer students the opportunity to enrol in a comprehensive program not available with the three-year program. Four-year major students are strongly encouraged to consult with members of the department to ensure an integrated and coherent programme.

A student who wants to have the option of later converting an advanced major to an honours degree should select classes in

accordance with the list of core classes above and should consult regulations 11.4 and 22. An honours program can be converted to an advanced major at the student's discretion. The advanced major does, however, allow a maximum of only nine credits in economics while the honours program allows a maximum of eleven.

BA Degree Programme (Three Years)

Undergraduate Coordinator: M. Bradfield (494-2026)

General Format

Requirements for a major in economics can be satisfied by taking Economics 1100 or equivalent and any four other full-year classes, or equivalent, in economics. Intermediate micro and macro theory (Economics 2200 and 2201, respectively) are not required but serve as prerequisites for most other classes and should be taken. Students who wish to keep open the option of transferring into the honours or advanced majors programmes should select classes consistent with the requirements of these programmes.

BSc Degree Programme (Three Years)

Undergraduate Coordinator: M. Bradfield (Tel. 494-2026)

For the general description of the programme see the description of the BA degree programme. The specific requirements are set out below.

Requirements:

1. Economics 1100, 2200A/B, 2201A/B, 2260A and 2280B, 3338A,
2. Math 1000A, 1010B, 2030A/B,
3. A total of at least four full-year classes, or equivalent, in Economics other than Economics 1100,
4. Students must arrange their courses to ensure that they satisfy the overall faculty requirements for the general BSc degree.

Several combined programmes may also be arranged, with economics as the major or minor subject in association with such other fields as political science, sociology, history, geology, biology, mathematics - and possibly others.

Final programme approval for all majors' students must be obtained from the appropriate coordinator.

Classes Offered

Classes marked with an * are normally offered on a three year rotational basis. Please consult the department for details regarding rotational schemes. Classes marked with a ** are of a special nature and not

necessarily offered on a regular basis. Please consult the department for details regarding such class offering.

ECO 1100R Principles of Economics: For those lacking a background in economics, this class is taken as the first in a series of classes in economics or as a background elective. Emphasis is on developing the basic analytical tools and applying them in the context of contemporary, and generally Canadian, economics problems. Section 5 of Economics 1100 offers a problem-oriented framework in which the analytical tools are developed by examination in each term of a specific question. No more than one credit will be given for 1100, 1101, 1102, and 1105B.

Format: lecture 3 hours, tutorial 1 hour (optional)

Instructor: Staff

****ECO 1101A/B Principles of Microeconomics:** This class completes the principles of economics complement. Consult Department.

Format: lecture 3 hours, tutorial 1 hour (optional)

Instructor: Staff

Restriction: Available to students who need one half credit of introductory microeconomics.

****ECO 1102A/B Principles of Macroeconomics:** This class completes the principles of economics complement. Consult Department.

Format: lecture 3 hours, tutorial 1 hour (optional)

Instructor: Staff

Restriction: Available to students who need one half credit of introductory macroeconomics.

****ECO 1105B Principles of Economics:** For description see Economics 1100. Consult Department. No more than one credit will be given for 1100, 1101, 1102, and 1105B.

Format: Lecture 6 hours, tutorial 2 hours (optional)

Instructor: Staff

Restrictions: Available only to students who are enrolling for the first time in January or who are declared economics majors, in that order of priority.

ECO 2200A/B Intermediate Microeconomics: An extension of microeconomic theory and its applications which satisfies the minimum microeconomic theory requirements for majors in economics. Also of interest to Commerce students or others not majoring in economics, it pays particular attention to applications of theory in a practical context. Serves as the microeconomic prerequisite for higher-level classes in economics.

Format: Lecture 3 hours
Instructor: Staff
Prerequisite: Economics 1100 or equivalent

ECO 2201A/B Intermediate Macroeconomics: Inflation, unemployment, exchange rate and related macro problems, with emphasis on Canadian policy experience in these areas. An extension of macroeconomic theory and its applications which satisfies the minimum macroeconomic theory requirements for majors and honours in economics. Of interest to commerce students or others not majoring in economics, it serves as the macroeconomic prerequisite for higher-level classes in economics.

Format: Lecture 3 hours
Instructor: Staff
Prerequisite: Economics 1100 or equivalent

ECO 2232R Canadian Economic History: The development of Canada from the age of discovery to now, presented in relation to the larger system of the relationships between the Old World and the New. As the class proceeds, the focus shifts more and more towards Canada and more formal theory is introduced in discussing Canadian problems and policies, especially in the twentieth century.

Format: Lecture 3 hours
Instructor: B. Lesser
Prerequisite: A class in economics principles and some knowledge of history is recommended.

***ECO 2238A The Industrial Revolution in Europe: Transitions from preindustrial to industrial economies in England, France, Germany and Russia form a broad background for understanding the roots of contemporary society; of particular relevance for those interested in the economic history of Canada, the United States and other countries formerly part of a colonial system. Emphasis is on the economic, social, and technical changes of these industrial "revolutions" to disclose common elements in the experience of industrialization.**

Format: Lecture 2 hours
Instructor: P.B. Huber
Prerequisite: Introductory Economics or permission of instructor

***ECO 2239B The European Economy in Historical Perspective - After the Industrial Revolution: A self-contained class (may be taken separately from Economics 2238A) examining the contrasting development patterns of various industrialized European countries after their respective industrial revolutions and up to about 1980. Focus is on the development of hypotheses regarding the causes and effects of differences in the experience of growth of mature economies.**

Format: Lecture 2 hours

Instructor: P.B. Huber
Prerequisite: Introductory Economics or permission of the instructor

ECO 2250R An Applied Course in Economic Development and the Environment: Concepts, Policies and Projects: This class is designed around concepts of sustainable development, with emphasis on key issues facing developing countries and less prosperous regions of some industrial nations. There are three main elements: (1) conceptual underpinnings and tensions behind sustainable development; (2) international, national and regional level policies and planning approaches for sustainable development - including lessons from the Rio Summit, the World Bank, CIDA, Canada's Green Plan and the European Regional Development Fund; and (3) projects for sustainable development - drawing on case experience and first-hand field work undertaken as a part of the class programme.

Format: lectures, case work with group presentations, tutorials, 3 hours

Instructor: R.I. McAllister
Prerequisite: Introductory Economics or permission of instructor

ECO 2260A Statistics I: For description see MATH 2060A.

Cross-listing: Math 2060A

ECO 2280B Statistics II: For description see MATH 2080B.

Cross-listing: Math 2080B

SCI 3000R Science Fundamentals: An interdisciplinary class that stresses the motivations, methodologies, and responsibilities of scientists, and provides extensive formal instruction in written and oral communication of scientific material. For details, see main calendar entry "Science, Interdisciplinary." The status of this class (elective, minor, or major credit) varies from department to department; check with your undergraduate advisor.

***ECO 3241A Comparative Economic Systems: Nations' Economies: A detailed background of institutional material on the structure and performance of several economies is featured. Reading on specific countries provides the basis for several short papers. A student taking this class must understand the interrelated character of economic activity and grasp the nature of the price system.**

Format: Seminar 2 hours
Instructor: P.B. Huber
Prerequisite: Introductory Economics

***ECO 3242B Comparative Economic Systems: Economic Organization and Planning: The economic behaviour of organizations and the ways in which this can**

be controlled provide the basis for consideration of the theory and practice of economic planning at micro-economic and macro-economic levels in various institutional contexts.

Format: Seminar 2 hours
Instructor: P.B. Huber
Prerequisites: Introductory Economics, plus an additional half-class in Economics

ECO 3315A Labour Economics: The theory of labour markets is emphasized, in particular the aftermath of alternative viewpoints which seek to explain relative wages, unemployment and the allocation of labour.

Format: Lecture 3 hours
Instructor: L. Osberg or S.A. Phipps
Prerequisites: Economics 1100; Economics 2200 and 2201 (or equivalents) are recommended

***ECO 3316B Collective Bargaining and Labour Market Policy:** Topics covered are the theory and institutions of collective bargaining and current issues in labour market policy, e.g. discrimination, manpower planning, wage/price controls, impact of unemployment insurance or the negative income tax.

Format: Lecture and seminar
Instructor: L. Osberg
Prerequisite: Economics 3315A

***ECO 3317B Poverty and Inequality:** The extent of poverty and the distribution of income and wealth in contemporary societies are discussed. Most data are drawn from Canada but international evidence is introduced for comparative purposes. The theories underlying alternative measures and explanations of economic inequality are emphasized.

Format: Lecture and seminar
Instructor: L. Osberg
Prerequisites: Economics 1100; Economics 3315A is highly recommended

***ECO 3325A Money and Banking:** The class concerns the nature and operation of the financial system, with particular reference to Canadian experience. It treats financial instruments (including money) and institutions and the social control of the supply of money and credit. This class is complemented by Economics 4425B.

Format: Lecture 3 hours
Instructor: Staff
Prerequisite: Economics 1100R. It is also desirable to have completed Economics 2201A/B (or equivalent).

***ECO 3326R Industrial Organization:** The application of the models of price theory to economic reality. In any industry, the problems of a firm competing with its rivals

in order to survive and acquire a higher market share are far more complex than those in price theory where we have to deal with more or less simplified assumptions. The three main parts are: market structure, market conduct and market performance.

Format: Lecture 2 hours
Instructor: C. Marfels
Corequisite: Economics 2200A/B (or equivalent) or instructor's consent

***ECO 3330A/B International Trade:** The causes of international exchange of goods and services are considered and the effects of international integration on the incomes and growth rates of national economies are analyzed. The theory and practice of commercial policy and other restrictions on trade are considered after the pure theory of international trade and its implications have been explored. Depending upon class interest and availability of time, the subjects of economic integration and of Canadian commercial policy may be discussed in some detail.

Format: Lecture 3 hours
Instructor: R.L. Mazany or A.M. Sinclair
Prerequisites: Introductory Economics and 2200A/B (or equivalent)

***ECO 3332A/B Resource Economics:** This class focuses on intertemporal economics and the economics of market failure as they pertain to the use of natural resources. A selection of resource sectors will also be discussed. Fisheries, agriculture, forestry, and energy represent possibilities, but this will vary from year to year.

Format: Lecture 3 hours
Instructor: M. Cross
Prerequisite: Introductory Economics. Economics 2200A/B (or equivalent) is also desirable.

***ECO 3333A/B Theories of Economic Development:** A theoretical framework for the understanding of the process of economic development in the more and the less developed countries is provided with a view to its eventual application to the solution of practical problems. The concluding seminars are devoted to the problem of the foundations of the theory of economic development, and the distinction between the concepts of unilinear and multilinear evolution is discussed.

Format: lecture 2 hours
Instructor: B. Lesser
Prerequisite: Introductory Economics. Economics 2201A/B (or equivalent) and Economics 3347 and 3348 are desirable.

***ECO 3334A/B Economic Development - Recent Debates, Controversies and Conflicts:** Whereas Economics 3333A deals with the

more rigorously defined theories and models and their appraisal, this class focuses on the development policies and related controversies. Important examples of such controversies and conflicts, with far reaching developmental consequences, are provided. Attention is paid to the much debated environmental aspects of growth and development.

Format: Lecture 2 hours
Instructor: Staff
Prerequisite: Economics 1100. Economics 2201 (or equivalent) and Economics 3333A/B are desirable.

***ECO 3336B Regional Development:** Most countries have richer and poorer regions. The energy crisis has raised additional complications. Economic development issues, policies, and theories facing more industrialized nations are analyzed with particular focus on Canada (especially the Atlantic region), the European Economic Community, U.S.A., Japan, and Australia.
Format: Seminar 2 hours and tutorials
Instructor: R.I. McAllister
Prerequisite: Introductory Economics. At least one class in both Political Science and Canadian History are desirable.

ECO 3338A Introductory Econometrics I: The theory of some quantitative methods commonly used by economists is discussed in the context of the classical linear model. Estimation problems caused by violations of the assumptions of the classical model are studied including heteroscedasticity, autocorrelation and simultaneous equations bias. Emphasis is placed on practical econometric problems by requiring students to conduct their own research projects.
Format: Lecture 3 hours
Instructor: Staff
Prerequisite: Mathematics 1000 (or equivalent) and Economics 2260A and 2280B (or Math 2060A/2080B).

****ECO 3339B Introductory Econometrics II:** Further practical problems associated with economic data and with model specification and estimation are discussed. This course is an extension of Economics 3338A.
Format: Lecture 3 hours
Instructor: Staff
Prerequisite: Economics 3338A

***ECO 3344A or B Public Finance I:** This course studies the economics of public expenditure programmes. One major theme is that markets do not always lead to economic efficiency. A second major theme is that equity concerns are central to public policy formation.
Format: Lectures 3 hours

Instructor: staff
Prerequisite: Introductory Economics, Economics 2200A or B and 2201A or B (or equivalents) are desirable.

***ECO 3345A or B Public Finance II:** This course studies the economics of taxes and transfers. Equity and efficiency effects of both are considered.
Format: Lecture 3 hours
Instructor: Staff
Prerequisite: Introductory Economics, Economics 2200A or B and 2201A or B (or equivalents) are desirable.

***ECO 3347A/B Classical Political Economy:** The theories of production, value, distribution, and economic growth developed in classical political economy will be discussed in this class. Relations to classical political economy and links between this body of thought and macroeconomics will be included as time permits.
Format: Lecture 3 hours
Instructor: M.L. Cross
Prerequisite: Economics 1100R; Economics 2200A/B and 2201A/B (or equivalents) are recommended, but not required; though intermediate theory is not a prerequisite, it will be assumed that students taking this class have achieved the level of academic maturity normally expected in third year university students.

***ECO 3348A/B Modern Economic Thought:** Theories of production, value, and distribution developed since the marginal revolution, which dates from roughly 1870, will be examined in this class. Contributions to this body of thought developed before 1870, while classical political economy was dominant, will also be considered. Theories of equilibrium, stability, and economic growth will be discussed as time permits, but coverage of all topics must be selective because of the vastness of modern economic literature.
Format: Lecture 3 hours
Instructor: M.L. Cross
Prerequisite: Economics 1100 and 2200A/B or equivalent; Economics 2201 or equivalent advised.

ECO 3350A/B Social Cost Benefit Analysis: The methodological base of social cost benefit analysis is developed, demonstrating some practical applications. Social cost benefit analysis and capital budgeting are two approaches to investment decision making. The former is used by public sector agencies;

the latter is employed by private sector firms. Similarities and differences in the two approaches are highlighted. Solving problems which illustrate basic concepts and a paper reporting on an actual application of the methods taught are important requisites.

Format: Seminar 3 hours
Instructor: T.A. Pinfold
Prerequisites: Introductory Economics; Intermediate Microeconomics and Introductory Statistics are desirable.

ECO 4100C Honours Seminar: This is a required course for honours students, optional for others. The course is devoted to: a) preparation and presentation of honours papers; b) discussion of policy issues; and c) lectures and discussion by faculty members and occasional invited guests.

Format: Seminar 3 hours
Instructor: Staff
Prerequisites: Economics 2200A/B (or equivalent) and 2201A/B (or equivalent) and Economics 2228 (or Math 2060A/2080B)

ECO 4408R Competition Policy/Antitrust Economics: In this class the various ways of public policy towards business are discussed. Basically, there are three approaches to public policy towards business — the competitive approach, the regulatory approach, and the ownership approach. Under the first, the ownership of the means of production is in private hands, and the public interest is assumed to be protected by the free play of competitive forces. Under the second, ownership remains in private hands but in one way or another the state restrains the exercise of private economic power. And under the third, the state not only owns but manages and operates the productive facilities. Specific attention will be paid to the means of implementing the competitive approach to the antitrust laws.

Format: Lecture 2 hours
Instructor: C. Marfels
Prerequisite: Economics 3328R or instructor's consent

ECO 4418A Foundations of Public Policy Towards Business: In this course the reasoning for government interference of the free and, at times, not-so-free competitive environment in the corporate economy will be examined. This will include (i) an overview of the concepts of competition and monopoly with main emphasis on workable competition, (ii) the scope and objectives of public policy towards business, and (iii) a comparison of the competitive approach, the regulatory approach, and the ownership approach.

Format: Lecture 2 hours
Instructor: C. Marfels
Prerequisite: ECO 3328R

ECO 4419B Canadian Competition Policy: The discussion begins with a historical account of Canada's past experience with the Combine Investigation Act and the attempts to amend it. Main emphasis is on the New Competition Act of 1986 and on the rules for mergers and for abuse of dominant positions. Various case studies will exemplify the new powers vested in the Director of Investigation and Research and the role of the Competition Tribunal.

Format: Lecture 2 hours
Instructor: C. Marfels
Prerequisites: Economics 4418A

ECO 4420A or B Microeconomic Theory: A basic but rigorous introduction to modern microeconomic theory. Deals in detail with the theory of choice as applied to consumers and firms, and discusses the working of an economy as a system of interdependent decision-makers. Emphasis is on the comparison of alternative solution concepts for competitive economies ending with an introduction to stability theory.

Format: Lecture 3 hours
Instructor: E. Klein or S. DasGupta
Prerequisites: Economics 2200 (or equivalent); Mathematics 1000 and 1010 are desirable.

ECO 4421A or B Macroeconomic Theory: For those who wish to do relatively advanced work in economic theory, possibly with the thought of going on to do graduate work in economics. The class assumes some knowledge of calculus. Topics covered include: classical models of income and employment; Keynesian models of income and employment; the theory of economic growth (including two-sector models); and trade cycle models.

Format: Lecture 3 hours
Instructor: J. Cornwall
Prerequisites: Economics 2201A/B (or equivalent) and Mathematics 1000 and 1010 (or equivalent)

***ECO 4422B Inflation, Stagflation and Macroeconomic Policy:** A consideration of different theories of inflation that have been developed to explain the acceleration of inflation in the past decade. Alternative policy solutions are appraised. Forms of incomes policy are taken up in some detail.

Format: Lecture 3 hours
Instructor: J. Cornwall
Prerequisite: Economics 2201 (or equivalent)

***ECO 4426B Monetary Policy:** Assuming a basic knowledge of monetary institutions and macro-economics, a critical analysis of the objectives and effectiveness of monetary policy is developed. Particular attention is given to the Canadian experience and the effectiveness of Canadian policy.

Format: Lecture 3 hours
Instructor: Staff
Prerequisite: Economics 2201A/B (or equivalent); It is advantageous for students to have completed Economics 3326A as well.

***ECO 4431A/B International Payments:** Selected topics in recent international monetary history are examined, the causes of, and remedies for, external imbalance in national economies are considered, and the reorganization of the international monetary system is discussed. Depending upon class interest, certain issues of international development finance and problems of instability and growth in the international economy may be discussed in detail.

Format: Lecture 3 hours
Instructor: R.L. Mazany or A.M. Sinclair
Prerequisite: Economics 2201A/B (or equivalent)

****ECO 4446A/B Classical Liberalism, and Democracy:** For description see Philosophy 4470A/B.

Format: Seminar 2 hours
Instructor: Staff
Cross-listing: Philosophy 4470A/B, Political Science 4479B

****ECO 4447B The Theory of Games as an Approach to the Foundations of Ethics and Politics:** For description see Philosophy 4430A/B.

Format: Seminar 2 hours
Instructor: Staff
Cross-listing: Philosophy 4430A/B

****ECO 4448A Social Choice Theory:** For description see Philosophy 4480A/B.

Format: Seminar 2 hours
Instructor: Staff
Cross-listing: Philosophy 4480A/B

Graduate Studies

The Department offers a graduate programme leading to the MA, MDE and PhD degrees. Details of these programmes, including a list of graduate courses, are given in the Calendar of the Faculty of Graduate Studies. Senior undergraduates may be admitted to some graduate classes at the discretion of the instructors concerned.

School of Education

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Professors
 W.F. Hare, BA (London), MA (Leice), PhD (Tor)
 T.A. Laidlaw, BA MEd (Calgary), PhD (Alta)
 J.D. Myers, BA, MA (Tor), PhD (Edinburgh)
 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)
 P. De Meo, BA, MA, PhD (UCLA), Major appointment in French
 R. Gamberg, BA (Brandeis), MA (Illinois)
 D.A. Manicom, BEd (MoG), MEd (AIE), PhD (Tor)
 J. Manos, BA, BEd (StFX), MEd (Calgary), PhD (Alberta)
 H.J. Murphy, BSc (St. Dunstan's), BEd (PEI), MEd, EdD (Virginia)
 P.A. Perron, BMus (MoG), MMusEd (Holy Names College), Major appointment in Music
 E.W. Ricker, BA, MEd (UBC), PhD (Tor)
 S.W. Semple, BA, Dip Ed (Syd), MEd, EdD (Tor)
 S.S. Sodhi, BA, BT, MA (Punjab), Dip. Guild. (Delhi), BEd, PhD (Alta)
 K.C. Sullivan, BSo, BEd (Dal), MEd, PhD (Alta)
 M. Welton, BA, MA, PhD (UBC)
 B.A. Wood, BA (Tor), MEd, PhD (Ottawa)

Assistant Professors
 M.L. Crowley, BA (Miami), MAT (Johns Hopkins), PhD (Maryland)

Part-time Faculty
 J. Blain, BSo (Napier), MA, PhD (Dal)
 R. Buokley, BA, BEd, MEd (MSVU)
 M. Forrest, BA (MSVU), BEd, MA (Dal)
 B. Fox, BA (Sheffield), MA (Dal), PhD (AIE)

D.F. Goble, BSo, MSc (Alta), PhD (Tor), Major appointment in Physics
 P. Harding, BA (Tor), BEd, MSo (Dal)
 L. Jackson, BA (UBC), MEd (Dal)
 D. Leitch, BA, BEd, MA, PhD (Dal)
 J. Rice, BA (Mt.A.), BEd, MEd (Dal)

Education As a Field of Study

The problems of education have been the subject of serious study since at least the time of Plato and Aristotle. Education is an important and interesting field of study in which historical, psychological, philosophical and sociological inquiries, among others, can be pursued. Many elect to take classes in Education because they are interested in the questions raised for their own sake. Others are interested in education as a programme of professional preparation. Such students include in their programmes classes in foundations, methodology and field experience. The study of education should alert the student teacher to the assumptions which lie behind the methods of teaching being considered, and it should ensure that these assumptions do not go unexamined.

Affirmative Action Policy

The School of Education has an affirmative action policy for indigenous Black or MiMac applicants for all of its programmes. Such applicants will be looked upon favourably as long as the normal minimum admission standards are fulfilled.

Programmes

1. A sequential secondary BEd programme of one year which may be taken by students who have already completed a BA or BSo degree. Studies in English, French, Math, Science, Social Studies, Geography, and Music are available.
2. An integrated programme at the secondary level at the end of which students are awarded simultaneously the degree of BA or BSo or BA (Honours) or BSo (Honours) and BEd.
3. Dalhousie BA/BEd or BSo/BEd for holders of the Nova Scotia Teachers' College Associateship.
4. Dalhousie-Nova Scotia Teachers' College Associateship BEd.
5. A five-year integrated programme at the elementary or secondary level at the end of which students are awarded simultaneously the degrees of BPE and BEd. To enter this programme, students must first be enrolled in the Bachelor of Physical Education programme.
6. Classes which may be used for credit toward a BA or BSo. These classes may be chosen from the following areas:

Sociology of Education, History of Education, Philosophy of Education, and Educational Psychology. Students intending to take education classes for credit toward a BA or BSc degree should consult Arts and Science regulation 11.2. Students may not take an Education course as one of their first five credits.

Class Categories

Classes in the BEd programme are grouped into three general categories:

1. Educational Foundations
2. Methods and Field Experience
3. Electives

1. Educational Foundations

These classes develop a theoretical perspective as a basis for professional performance. There are four main subdivisions in this category - sociology of education, history of education, philosophy of education, and educational psychology. These classes are found in the calendar under course numbers EDUC 4000 to EDUC 4499.

2. Methods and Field Experience

These classes deal essentially in an applied manner with teaching, learning and the evaluation of learning. They are found in the calendar under course numbers EDUC 4800 to EDUC 4999.

3. Electives

These classes provide supporting experience for other classes in Education, additional academic preparation, or an introduction to areas of potential student interest. Electives may be chosen from any courses offered in the BEd programme or classes in departments of the Faculty of Arts and Social Sciences or Faculty of Science. Education electives are found in the calendar under course numbers EDUC 4500 to EDUC 4899.

Programme Requirements

BEd Secondary Sequential

The majority of our BEd students participate in the sequential programme, which is completed between September and May. Candidates for this degree of BEd (Secondary) must complete successfully a 7-credit programme. This consists of the following: a half-credit course in each of the 3 Educational Foundations areas: sociology, history, and philosophy; 1.5 credits in Psychological foundations (including special education); 1 credit in a methods course in a teachable subject area (English, French, Social Studies, Math, Science, Music, Geography); 1 credit in Education 4900 (Field

Experience); 1 credit in Education 4950 (Studies in Education); and 1 further credit elective approved by the faculty advisor.

BPE/BEd Integrated

The BEd part of the integrated programme consists of a minimum of five full credits:

1. ½ credit in each Foundation area: Sociology, Philosophy, and History;
2. 1½ credit in Psychological Foundations (Including Special Education).
3. Secondary: 1 credit in Teachable subject methods.

Elementary: 1 credit in Language Arts/Reading methods, one-half credit in Math methods, and ½ credit in elementary social studies or elementary science methods

4. 1 credit in field experience

Co-requirements

Elementary: A student must complete a minimum of 3 full classes from English, History, Math and Science. It is recommended that courses be selected from each area.

Secondary: A student must complete a minimum of 3 full classes above the 1000 level in a teachable subject*.

* Teachable subjects - English, French, Social Studies, Math, Science, Geography, Music.

BEd Degree in Association with Nova Scotia Teachers College

General Description

The programme is available at Dalhousie University to graduates of the Nova Scotia Teachers College who have completed the three-year Associateship at NSTC. Suitably qualified students may graduate after taking five further classes at Dalhousie. The programme is a fifteen-credit one, comprising six credits in education and nine credits in Arts or Science. A maximum of ten credits may be transferred from NSTC to the joint Dalhousie/NSTC BEd degree, but they must meet Dalhousie's transfer credit regulations.

Programme: 15 required credits

1. Education (6 credits):
 - (a) 5 maximum may be taken at NSTC and must meet Dalhousie transfer credit regulations;
 - (b) 1 education class must be taken at Dalhousie.
2. Arts and Science (9 credits):
 - (a) 5 maximum may be taken at NSTC and must meet Dalhousie transfer regulations and not be in education;

- (b) 3 must be taken at Dalhousie in Arts and Science subjects other than education and at least 2 must be above the first year level;
- (c) 1 class, taken at Dalhousie, must be in consultation with the student's advisor (in the School of Education)

Dalhousie BA or BSc and BEd Degrees for Associates of Nova Scotia Teachers College

General Description

The programme is available at Dalhousie University to graduates of the Nova Scotia Teachers College who have completed the three-year Associateship at NSTC. Suitably qualified candidates may transfer up to eleven credits from NSTC to Dalhousie. The programme is a twenty-two credit one, comprising seven credits in education and fifteen credits in Arts or Science. All credits transferred from NSTC must meet Dalhousie's transfer credit regulations.

Programme: 22 required credits

Twenty-two credits are required, seven in education and fifteen in Arts & Social Science and Science.

1. Education (7 credits):
 - (a) 5 maximum from NSTC;
 - (b) 2 further from Dalhousie
2. Arts & Social Science and Science (15 credits):
 - (a) 6 maximum from NSTC;
 - (b) 9 further from Dalhousie

Students must maintain a minimum of a B average in work completed for both degrees.

Certification of Teachers

Licences to teach are issued by the Department of Education, Province of Nova Scotia. Information may be obtained from the Registrar, Nova Scotia Department of Education. Students from other provinces should consult the appropriate provincial department of education for certification and licensing information.

Classes Offered

Educational Foundations (EDUC 4000 - EDUC 4399)

Enrolment is generally restricted to 30 students in Educational Foundations classes.

1. Sociology of Education (EDUC 4000 - EDUC 4099)

EDUC 4012A or B Sociology of Education: Using the theme approach, students will work in groups to conduct in-depth studies on either social class, race, or gender. They

will focus their attention on the assumptions underlying school practices and the effects of these practices in relation to the three areas of study. They will also examine aspects of learning outside the formal school structure as they bear on social class, race, and gender
Format: Group discussion

EDUC 4021A or B An Introduction to Gender Socialization: Identification and analysis of problems deriving from gender socialization form the core of this class. Attention is concentrated on informal (out of school) socialization in creating and perpetuating the problems.

Format: Lecture, discussion, student participation

Prerequisites: None, but preference is given to Education students and students in Women's Studies.

EDUC 4022A or B Gender Issues In Education: Central concerns in education include classroom practices, politics and ideology of the curriculum, family-school relations and the transition from school to work. Recent feminist critiques have forced educators to re-examine these areas of concern. This course considers how gender analysis deconstructs and reconstructs our understanding of central economic, social and cultural issues in education.

Format: Lecture/Seminar, 2 hours

2. History of Education (EDUC 4100 - EDUC 4199)

EDUC 4121A or B Canadian New Education Movement: Topics include the kindergarten, nature study and Macdonald-Robertson movements; mechanic and domestic science, physical and health education curricular changes; and the liberal-democratic goals, institutional effects of the new education movement on schooling in Canada between 1890 and 1920.

Format: Lectures and student presentations, 2 hours/week

EDUC 4132A or B Canadian Progressive Education: Topics include mental testing and mental hygiene movements, structural changes in school administration, professionalization of teachers, the country life movement, technical and vocational education, and the increasing alliance of schooling with the growing welfare state in Canada. Period covers 1920-1940.

Format: Lectures and student presentations, 2 hours/week

EDUC 4141A Issue in the History of Canadian Education: An overview of selected and enduring social, economic, and political issues in the history of Canadian education. Representative topics include: child-centred school or the "3 R's"; a

"Canadianized" curriculum or one free from patriotic bias; community or bureaucratic control; stratification and social control or equal opportunity; teacher professionalism vs. unionism; denominational vs. secular education.

Format: Lecture 2 hours

EDUC 4142B Issues in the History of Canadian Education: An overview of the experiences of ethnic and religious minority groups in the history of Canadian education. Topics in the first part of the course include: 19th century arrangements for minorities, including the BNA Act and immigration agreements; the development of bilingualism policy and minority language schools; the development of multiculturalism policy. In the second part of the course particular groups are profiled, including Acadians, Blacks, Native Peoples and selected cultural-religious minorities (Hutterites, Mennonites, Doukhobors).

Format: Lecture - 2 hours

EDUC 4161C History of Curriculum Thinking:

Topics include contemporary curriculum thought, evolution of ideas concerning development, evaluation, implementation, contributions of selected theorists.

Format: Structured seminars (2 hours)

Enrolment: Limited to BEd students

EDUC 4190A Didactic Tales: Part One: A brief history of didactic tales and the women and men who invented them. A critical review of some of the world's best known teaching stories and the people who created them up, relating the assumptions of the storytellers to the education practices of their times.

The *Garden of Eden* and the satirist who invented the tale. The epic tale of the *Mabinogion* and the Druids who devised it. The account of the *Pilgrim's Progress* and its author John Bunyan. *Uncle Tom's Cabin* and best-selling novelist Harriet Beecher Stowe. *The Song of Lawino* and the Ugandan poet Okot p'Bitek. *The Lord of the Rings* and its chronicler J.R.R. Tolkien.

Students from all disciplines are welcome. No previous knowledge of the history and literature of education is required. Those participating in the course will be expected to write essays on two of the didactic tales studies.

Students may take Part One by itself, Part Two by itself, or both Part One and Part Two.

EDUC 4191B Didactic Tales: Part Two: The *Bhagavad-Gita* and the singer who sang the Celestial Song. The *Big Bang* and the physicist who dreamed it up. The *Tales of the Dervishes* and the Najmudin Kubra, The Sufi sage. *Le Mont Analogue* and the writer

René Daumal. The *Kung* tales of *Nisa* recorded and translated by Marjorie Shostak. *Rakku's story* of structured ill-health in India and Sheila Zurbirgg. *Re: Colonised Planet 5* *Shikasta* and *Emissary* (Grade 9) Doris Lessing.

Students from all disciplines are welcome. No previous knowledge of the history and literature of education is required. Those participating in the course will be expected to write essays on two of the didactic tales studied.

Students may take Part One by itself, Part Two by itself, or both Part One and Part Two.

EDUC 4201A or B Analytical Philosophy of Education: Topics include: the aims of education, the relevance of philosophy to education, children's rights, and the moral responsibilities of the teacher.

Format: Lectures and discussions (two hours per week)

EDUC 4221A Introduction to the Philosophy of Education: A class dealing with a broad range of philosophical questions about education including the use of language, multiculturalism, teacher education, and the role of the teacher. Cross-listed with Philosophy 2175.

Format: Lecture/discussion

EDUC 4222B Issues in Philosophy of Education: An introductory level class dealing with some fundamental issues in philosophy of education, including indoctrination, open-mindedness and bias-free teaching. Cross-listed with Philosophy 2180.

Format: Lecture/discussion

4. Psychology of Education
(EDUC 4300 - EDUC 4399)

EDUC 4311A Psychology and Education of the Exceptional Child: Exceptional child, socio-historical foundations, psycho-diagnostic, psycho-social models, genetic and environmental causes, various categories of exceptionality, standardized tests, abuses, myths in special education, remediation.

EDUC 4312B Emotionally Disturbed and Learning Disinterested Children: Emotionally disturbed child, psycho-dynamic, developmental, neurological, behavioral, ecological models, remediation, learning disabled, learning disinterested, various models, remedial hoax, special education myths, politics of special education.

EDUC 4322A or B Learning in the Classroom: Topics include: the psychology of learning, setting and implementing learning objectives, and the evaluation of learning.

Format: Lectures and presentations
(two hours/week)

EDUC 4335A or B Childhood into Adulthood: Topics include: intellectual and social development during childhood, characteristics of adolescence, and theories of development during adulthood.

Format: Lectures and discussions/presentations
(two hours per week)

EDUC 4371A or B Social Psychology of Education: Topics include: classroom psychological climate, power relationships, authority, obedience, discipline, control, freedom, self-concept.

Format: Lecture and discussion

EDUC 4380R Psychology of Special Education: Resource Teachers: This course critically examines resource programmes used by the schools to "accommodate" children with learning and behavioral problems.

Topics include: the rationale for and types of resource programmes; roles and competencies of resource teachers; strategies necessary to implement resource programmes in schools so as to assess and instruct children with special needs; evaluation of materials and methods used by resource teachers to help "special children". This course has a limited enrolment. It is intended for the very serious student of special education.

EDUC 4400R Psychology and Special Education: This course is designed to give Bachelor of Education students an introduction to the major areas of Educational Psychology. Students will be exposed to important theorists and issues in the areas of Developmental Psychology, Learning Theory, Social Psychology, Testing and Measurement, and Special Education.

The course will consist of a consideration of the history of childhood, behaviourism, Piaget, and social learning theory; teacher-made tests, standardized tests, test scores and what they mean; social psychology in schools, gender issues, sex roles, Freud and Erickson; and exceptionalities, normalization, integration, learning disabilities, and children in distress.

Electives

(EDUC 4500 - EDUC 4699)

EDUC 4580R Geography in Education: While of direct value to teachers of social studies, the course is open to all students and without prerequisites. It uses techniques of the geographer to study three basic concepts: spatial form and interaction, interrelationship between people and their environment, and regions. Weekend rural field work in the fall involves absence from Halifax over a total of

two nights. Local field trips are conducted near the campus at various times during the academic year. Participation in field work is a condition of admission to the course. Evaluation is based on field work, case studies, class tests, and a major research paper.

Format: Lecture-lab 3 hours
Prerequisites: None

EDUC 4584C Introduction to the Study of Teaching and Pedagogy: The class is an introduction to contemporary research in teaching and pedagogy. Topics include teacher thought processes and behaviour, classroom organization and interaction, classroom discourse, teaching strategies, and school effectiveness.

Format: Structured seminars

EDUC 4634A or B Computers and the Classroom: An introductory class for students with little or no prior computer experience. Emphasis is on developing familiarity with commonly-used software applications, with an aim to assessing their potential in the classroom. Topics include computer-assisted instruction, computer-managed learning, authoring languages, evaluating instructional software, word processing, electronic spreadsheets, and communications via mainframe computer networks.

EDUC 4637A and EDUC 4638B Creative Writing and the Computer: Topics include: The imaginative use of word processing to write, design, illustrate and publish student work in an educational setting. The use of simple modular programming to write and illustrate inter-active multi-dimensional fiction and animated poetry.

Students may take either course on its own, or both courses, as they wish.

Format: Lecture 1 hour, lab 3 hours

EDUC 4642B Adventure-Based Experiential Education: Outdoor education in one form or another is included as an integral part of most recreational programmes. However, there are values of outdoor adventure activities which go beyond the usual rationale for recreation programmes. These include personal development, citizenship training, leadership development and community service. This class will explore some of the educational philosophies which rely on an experiential base. Included will be an opportunity for hands-on experiences in developing, planning and evaluating an adventure-based programme which has potential beyond the traditional recreation outcomes. A practicum will be included.

EDUC 4661A or B Reading, Writing, and Learning Across the Curriculum: Intentions: I have several goals for this course: (1) to help

you develop a greater awareness of the factors that affect learning from text; (2) to help you discover and examine your assumptions about the nature of learning and teaching; and (3) to help you explore the potential of writing as a vehicle for learning. Rather than to prepare you to work as reading specialists, this course is intended to help you become more effective teachers regardless of your areas of interest/expertise.

EDUC 4684B Physical Activity for Special Populations: For class description see entry for 2384, the Bachelor of Physical Education section of this calendar.

Format: Lecture/practical experience

Methods of Secondary School Teaching (EDUC 4800 - EDUC 4899)

EDUC 4810R Teaching English in Secondary Schools: In weekly two-hour classes of small and whole group discussions, students concentrate on the theory behind the Nova Scotia Department of Education guideline for English teachers, trying to apply this theory to the classroom. By the end of the year students should have an understanding of the relationship between language and learning and be able to apply that understanding in developing practical activities which will help their own students become active learners.

EDUC 4820A/4821B Teaching French in Secondary Schools: Open only to students who have demonstrated adequate competence in French language and culture (passing a French language proficiency exam is required). Students taking this class must consult the instructor. A consideration of foundations of second language teaching which moves to a discussion of methodology, techniques, materials (including visual aids), and testing. Emphasis is on developing teaching strategies which enable students to use French as a tool for authentic self-expression, orally and in writing. Directed observation of experienced teachers and practice in the development of teaching skills are integral parts of the class. Evaluation is based upon class participation (micro-teaching, oral reports, contributions to discussions), written projects, lesson plans, and examinations.

EDUC 4830R Teaching Geography in Secondary Schools: The class presents a variety of models for teaching geography, as part of junior high social studies or senior geography courses, and treats the acquisition of skills, concepts, and values. Attention is given early to lesson and course planning and later to aspects of curriculum development. Course evaluation is based on assignments and class tests, essays, projects, and reports, all of which have direct relevance for intending teachers.

Format: Class 2 hours
Prerequisites: Instructor's consent

EDUC 4840R Teaching Mathematics in Secondary Schools: The study of a variety of methods relating to the teaching of mathematics at the secondary level forms the framework for this class. Students must read about each technique, participate in discussions about these techniques, and in many cases observe classroom situations where each method is used. A strong emphasis is placed on exploring the curriculum changes occurring in Education. This includes the place of statistics, the computer, the calculator, problem solving, and geometry in a school curriculum. Evaluation is based on one major project, assignments done individually and in groups, class participation, and a final examination.

EDUC 4850R Teaching Science in Secondary Schools: This course makes the connections between various learning theories and their applications to the teaching of science. Through a close examination of the goals, philosophy and methodologies of the junior high Science Plus programme and of senior high science curriculum, a wide variety of teaching strategies will be discussed and practiced. Recent concerns in science technology and society, as well as gender issues in science education, will be examined. In addition, other areas of interests and concerns in science education as identified by the students in the class will be addressed.

EDUC 4860R Teaching Social Studies in Secondary Schools: Skills in curriculum planning and course organization are developed, and a variety of teaching strategies are introduced. Topics include selecting content and methods setting reasonable objectives for teaching, developing fundamental skills in social studies, and evaluating achievement. Assignments will include written and oral presentations.

EDUC 4860C Teaching Music in Secondary Schools: An introduction to the development of a music programme at the secondary level. Emphasis is on how to teach a general music class exploring the use of song materials, music theory, movement and creativity, and listening skills. This class is cross-listed with MUS 4400.

EDUC 4881R Teaching Music in Elementary Schools: An introduction to the development of a music programme at the elementary level. Emphasis is on how to teach song materials, movement and creativity, reading and writing skills, and what to listen for in music. The educational philosophies of Kodaly and Orff are examined in some detail. Solmization, hand signs, rhythm names, and

body co-ordination are some of the skills to be developed. This class is cross-listed with MUS 3400R.

EDUC 4871A, 4872B, 4873C Further Educational Studies: Students may apply to instructors for permission to undertake either a specially designed reading course in a given area, or to undertake additional work in their first teaching method, for credit. The instructor thus assumes personal responsibility for supervising the work of a student enrolled in this half-credit elective course.

EDUC 4891A, EDUC 4892B, EDUC 4893C Additional Curriculum Projects: Students may apply to instructors for permission to undertake additional project work in the area of curriculum design, implementation, and evaluation, for credit. This may be done with prior consent in writing from the instructor(s) to the Coordinator, BEd Programme. The instructor(s) thus assumes personal responsibility for supervising the work of a student enrolled in this half credit elective course.

Field Experience

(EDUC 4900 - EDUC 4999)

EDUC 4900R, EDUC 4902A, EDUC 4903B Field Experience: It is the primary objective of the field experiences to provide students with opportunities to analyze, compare, and participate in a variety of teacher-learner situations. Students who intend to apply for a Provincial Teachers' Certificate should plan to log the equivalent of 200 hours field experience. All arrangements for field experiences are made by the BEd Coordinator.

EDUC 4901R Elementary Curriculum Study and Field Experience: Conducted partially in the Dalhousie University School, and partially in weekly tutorial sessions, this class will examine the theme study approach to programme planning, will help students design and implement their own unit plans, and will emphasize throughout whole language strategies and evaluation from a developmental perspective. Evaluation will be based on class participation and term reports.

The class seminars will take place in the fall term and they will be followed by field experience in the public schools after which a final evaluation will be made. Enrolment in this class is restricted to BSoHE and BPE/BEd students with permission of the instructor.

EDUC 4910S Additional Field Experience: (Available only during the first Summer Session.) Permission of the School is required. This one-half credit class is made available to the BEd students as an elective which they may choose to supplement the basic requirement for field experience. These

additional field experiences are acquired through a block of three weeks spent in the schools at the end of the academic year. This class can only be taken with the permission of the major methods instructor and the BEd committee.

EDUC 4950R Studies in Education: A variety of topics important to the professional development of teachers will be presented and discussed.

Engineering

Location: Sir James Dunn Building,
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Chairperson of Department

J.C. MacKinnon

Professors

J.C. MacKinnon, BEng (TUNS), MScEng (Lond), PhD (Dal), PEng
S.T. Nugent, BSc (Mem), BEng (TUNS), MAsc (Tor), PhD (UNB), PEng

Associate Professors

D.M. Lewis, BEng, MEng (NSTC), PEng
M.H. MANSOUR, BEng (Cairo), BSc (AIN Shams) MEng (McM), PhD (TUNS), PEng
D.G. HETALACK, BSc (Dal), BEng (NSTC), MSc, PhD (Manchester), PEng

Assistant Professor

C.K.K. Lun, BEng, MEng, PhD (McG), PEng

Introduction

Professional engineers are concerned with making the properties of matter and the source of energy in nature beneficial to mankind. The curriculum develops "an individual's ability to use the basic sciences, mathematics, engineering sciences, economics and social sciences to convert, use and/or manage resources optimally through effective analysis, interpretation, and decision making to meet objectives". University studies in engineering are concerned with the design of engineering systems, but the skills learned are widely applicable. Many engineers combine their profession with other activities, most notably management.

The professional degree in Engineering is the Bachelor of Engineering degree which is conferred by the Technical University of Nova Scotia in association with Dalhousie University. The first two years of study are taken at Dalhousie and comprise a programme of 11 credits which lead to the Diploma in Engineering. Upon successful completion of this programme, students will be admitted to the Technical University of Nova Scotia for a further three years of study leading to the degree of Bachelor of Engineering in Civil, Electrical, Mechanical, Mining, Chemical, Industrial, or Agricultural Engineering. These programmes have been accredited by the Canadian Accreditation Board of the Canadian Council of Professional Engineers.

TUNS offers a combined BEng/MEng programme in Metallurgical Engineering. The admission requirement is the Diploma of Engineering, but admission is limited on a competitive basis. The programme is accredited by the Canadian Accreditation Board of the Canadian Council of Professional Engineers.

Degree Programmes

Dalhousie offers various programmes for students wishing to pursue studies jointly in Engineering and in Arts or Science. Students may arrange programmes leading to a Bachelor of Science degree, with a major in Biology, Chemistry, Computing Science, Geology, Mathematics or Physics in addition to the Diploma in Engineering. Programmes leading to a Bachelor of Arts Degree in addition to the Diploma in Engineering can be arranged with a major in a language, social science, or humanities subject. These combined programmes require three years of study at Dalhousie. Three years are still required at TUNS in order to receive the Bachelor of Engineering degree.

Students wishing to enroll jointly in the Diploma in Engineering and Bachelor of Science or Bachelor of Arts programmes should consult the Department of Engineering for advice on programme planning.

Students who graduate from TUNS fulfill the academic requirements for registration as a Professional Engineer in all provinces in Canada. In addition to the academic requirements, the Profession requires that applicants for registration have practical experience relevant to the discipline of engineering. The minimum requirement is two years of experience subsequent to completion of the BEng. It is recommended that, in addition to this, students obtain engineering experience in the summer periods prior to graduation.

Diploma in Engineering

Admission Requirements

Students wishing to enroll in the Diploma in Engineering Programme in the Department of Engineering must satisfy the requirements for admission to the Faculty of Science at Dalhousie and must also satisfy the additional requirements of the Department of Engineering. Students are normally expected to have completed Nova Scotia Grade XII senior matriculation classes, or equivalent, in Mathematics, Physics and Chemistry and should rank well in their class. Students may be admitted with advanced standing.

Admission with Advanced Standing

Students wishing admission with advanced standing in the Diploma in Engineering Programme are advised that normally a minimum of seven full credit classes of those described for the programme must be taken at Dalhousie. Transfer credit will not be granted for any class in which the final grade was less than C, or equivalent, or for any class in which a final grade was granted conditionally. Moreover, summer school classes are normally required as part of any Engineering programme incorporating advanced standing. Students must obtain agreement for such programmes, prior to the start of the Summer School session which precedes the next regular session, from the Department of Engineering.

Diploma in Engineering Programme

The programme is organized on a term basis although some classes are of two terms duration. Terms I and II are Year I; Terms III and IV are Year II.

Term 1: Engineering 1100A, Mathematics 1000A, Chemistry 1020R, Physics 1100R, and one elective¹

Term 2: Engineering 1120B, Mathematics 1010B, Chemistry 1020R, Physics 1100R, and one elective¹

Term 3: Engineering 2121A, Engineering 2331A, Engineering 2240A, Engineering 2340A, Mathematics 2480A, and one elective¹

Term 4: Engineering 2222B, Engineering 2101B, Engineering 2230B, Engineering 2341B, Mathematics 2490B, and one elective¹

¹The electives are to be selected from the humanities and social sciences. In the first year the elective must be selected from an approved list of classes in which written work is considered frequently and in detail. Students should seek advice from the Department of Engineering concerning these electives.

BSc/Diploma in Engineering

Students may arrange programmes leading to a BSc with a major in one of the sciences in combination with the Diploma in Engineering. Upon completion of the joint programme, graduates receive both the Diploma in Engineering and a BSc degree.

The programme for the BSc plus Diploma in Engineering consists of fifteen classes. Eleven of the classes are the classes for the Diploma in Engineering. The remaining classes must be chosen to meet the requirements for the BSc. One of these requirements is that there must be four classes beyond the first year in the science major. If the science major is mathematics,

physics, or chemistry, then the recommended first year programme is the first year of the Diploma in Engineering. The second and third years each consist of approximately half of the remaining requirements for the Diploma and half of the requirements for the BSc. If the science major is computing science, biology, or geology, then students should seek the advice of the Department of Engineering, prior to registration in first year.

BA/Diploma in Engineering

Students may arrange programmes leading to a BA with a major in one of the arts (humanities, languages, social sciences) in combination with a Diploma in Engineering. Upon completion of the joint program, graduates receive both the Diploma in Engineering and the BA degree.

The joint programme consists of fifteen classes. Eleven of the classes are required for the Diploma in Engineering; two of these are electives which must be in the humanities or social sciences. The remaining four classes must be chosen to meet the requirements for the BA.

Students interested in this type of programme should contact both the Department of Engineering and the department for the BA major subject.

Classes Offered

Texts and names of instructors shown are for the previous year.

ENGI 1100A Graphics: In this class the basic problem of representing three-dimensional solid objects on a two-dimensional sheet of paper is solved by a variety of methods. Problems involving points, lines, planes, and objects are tackled using the techniques of multiview drawing, pictorials (oblique, isometric, and perspective), and descriptive geometry. Problems are solved using pencil and paper and also using Computer Assisted Drafting.

Instructor: D.M. Lewis
Format: Lecture 3 hours, lab 3 hours
Text: Engineering Design Graphics, Earle, latest edition

Enrolment: 150 maximum

ENGI 1120B Statics: Statics is the first in a sequence of three classes in Engineering Mechanics. The work in Statics is designed to instruct the student in concepts of force and equilibrium. Topics include a review of the laws of motion, elements of vector algebra, such quantities as position and force vectors, moments of a force about an axis, couple moments, equivalent force systems, and equilibrium of two and three-dimensional structures. Structural applications such as two-dimensional trusses, frames and simple

machines, as well as shear forces and bending moments in beams are discussed. Laws of Coulomb friction, centroids and centre of mass, and area moments and products of inertia are also presented.

Format: Lecture 4 hours, lab/tutorial 2 hours

Instructor: M.H. Mansour

Prerequisite: Mathematics 1000

Text: Vector Mechanics for Engineers, Vol. 1 Statics, 5th Edition, Beer and Johnston.

Enrolment: 150 maximum

ENGI 2101B Engineering Design: The work of ENGI1100A (Graphics) is extended to include technical drawings and computer graphics, a design project with working drawings and a technical report, as well as the construction and testing of a physical model.

Format: Lecture 3 hours, lab/tutorial 3 hours

Instructors: D.M. Lewis, J.C. MacKinnon

Prerequisite: Engineering 2121A, 2331A, 2240A, 2340A

Enrolment: 100 maximum

ENGI 2121A Dynamics of Particles: This second class in Engineering Mechanics considers the kinematics and kinetics of a single particle and of systems of particles. The class builds on the concepts introduced in Engineering 1120 (Statics); a vector approach is used. Topics include kinematics of a particle, Newton's laws, work, energy, power, conservative force fields, linear impulse and momentum, impulsive forces, impact, collisions, and angular momentum. All topics are treated using rectangular, path, and cylindrical coordinates.

Format: Lecture 3 hours, lab/tutorial 3 hours

Instructors: S.T. Nugent

Prerequisite: Engineering 1120B, Mathematics 1010

Text: Vector Mechanics for Engineers, Vol. 2 Dynamics, 5th Edition, Beer and Johnston.

Enrolment: 100 maximum

ENGI 2222B Dynamics of Rigid Bodies: This class completes the study of Engineering Mechanics. The concepts introduced in Engineering 2121 (Dynamics of Particles) are extended to rigid bodies. Topics include kinematics of a rigid body using both the translating reference frame theory and the general rotating reference frame theory, kinetics of plane motion of rigid bodies including general plane motion, energy methods, impulse and momentum methods and vibrations of single degree of freedom systems.

Format: Lecture 3 hours, lab/tutorial 3 hours

Instructor: TBA

Prerequisite: Engineering 2121A, 2240A, Mathematics 2480

Text: Vector Mechanics for Engineers, Vol. 2 Dynamics, latest edition, Beer and Johnston.

Enrolment: 100 maximum

ENGI 2230B Electric Circuits: An introduction to the fundamental laws of electric circuits and circuit parameters, the concept of time-constants, impedances, admittances, general network theorems, three-phase circuits and transformers. The laboratory periods illustrate the use of electrical measuring devices.

Format: Lecture 3 hours, lab/tutorial 3 hours

Instructor: S.T. Nugent

Prerequisite: Physics 1100, Mathematics 1010

Text: Circuits, Devices and Systems, 5th Edition, Smith and Dorf

Enrolment: 100 maximum

ENGI 2240A Computer Methods in Engineering: This class first introduces the student to computers in general and to our machines in particular, to the use of an editor for creating computer programmes, and to the design and running of simple programmes. The class then focuses on an algorithm-design process which uses structured programming techniques and is independent of the language chosen for coding. PASCAL is used as the implementation language, and it is taught to an intermediate level. Typical assignments involve computer solutions of engineering and mathematical problems.

Format: Lecture 3 hours, lab/tutorial 3 hours

Instructors: J.C. MacKinnon

Prerequisite: Engineering 1120B, Mathematics 1010

Text: Borland Turbo Pascal

Enrolment: 100 maximum

ENGI 2331A Strength of Materials: This class is an introduction to the study of the stresses, strains, and deformation of a solid body which results when static forces are applied to the body. Topics discussed include: the definition and transformation relations of stresses and strains, axial loading applications, torsion of circular sections, stresses and deflection of beams, combined static loading and column action.

Format: Lecture 3 hours, lab/tutorial 3 hours

Instructor: M.H. Mansour

Prerequisite: Engineering 1120B,
Mathematics 1010
Text: Mechanics of Materials,
Hibbeler
Enrolment: 100 maximum

ENGI 2340A Classical Thermodynamics: An introduction to the fundamental concepts and principles of thermodynamics as applied to engineering design problems. Topics in this class include: properties and processes of ideal gases and simple compressible substances, work and heat interactions, energy and the first law of thermodynamics — analysis of control masses and control volumes, entropy and analysis based upon the second law of thermodynamics, performance of selected components (e.g. turbines, compressors, pumps, heat exchangers) and systems (power and refrigeration cycles).

Format: Lecture 3 hours, lab/tutorial 3 hours
Instructor: D.G. Retallack
Prerequisite: Mathematics 1010, Chemistry 1020
Text: Fundamentals of Engineering Thermodynamics, Howell and Buckius.
Enrolment: 100 maximum

ENGI 2341B An Introduction to Fluid Mechanics: This class extends the basic concepts of mechanics from solids to fluids. It comprises the study of fluid properties, fluids at rest and in motion. Dimensional analysis is introduced. The fundamental flow-governing equations (conservation of mass, momentum and energy) are derived and applied to a selection of engineering problems.

Format: Lecture 3 hours, lab/tutorial 3 hours
Instructor: D.G. Retallack
Prerequisite: Engineering 1120B, 2121A, 2340A, Mathematics 1010, 2480
Text: Fundamentals of Fluid Mechanics, Gerhart and Gross.
Enrolment: 100 maximum

English

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Chair

R. Huibert (494-3411)

Undergraduate Advisor

Consult Department

Professors Emeritus

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M.M. Ross, OC, BA (UNB), MA (Tor), PhD (Corn), DLitt (UNB), LLD (St Thom), LLD (Dal), LLD (Queen's), DLitt (Trent), DLitt (Edinburgh), DLitt (Windsor), DSL (Trinity College), DLitt (Acadia) FRSC
S.E. Sprott, MA, BD (Melb), PhD (Col)

Professors

J. Fraser, MA (Oxon), PhD (Minn), George Munro Professor of English Literature
R. Huibert, BA (Sask), MA, PhD (Pitt)
M.A. Klug, BA (Minn), MA (Kansas State), PhD (Ill)
P. Monk, BA (Reading), MA (Carleton), PhD (Queen's)
R.J. Smith, BA (Natal), MA (Oxon), PhD (Natal) McCulloch Professor in English
R.R. Tetreault, BA (UBC), MA, PhD (Corn)
J.A. Weinwright, BA (Tor), MA, PhD (Dal)

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B. Greenfield, BA (York), MA (McG), PhD (Columbia)
A. Higgins, BA (Conn), MA (McG), MA (Mass), MA, PhD (Yale)
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D. McNeil, BA (Concordia), MA (UNB), PhD (Mich)
C.J. Myers, BA (Sask), MA, PhD (Tor)
M.I. Stone, BA (Queph), MA, MPhil (Wat), PhD (Tor)

Assistant Professors

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C. Lucky, BA, MA, PhD (Tor)
H.E. Morgan, BA (UBC), MA (Wash), B Litt (Oxon), PhD (Wash)
T. Ross, BA, MA (Carleton), PhD (Tor)
J.A. Thompson, BA (Western), MA, PhD (Tor)

Adjunct Professors

A.R. Andrews, BA, DipEd, MA (Leeds), PhD (Ill), FRSA

Senior Instructor

L. Choyce, BA (Rutgers), MA (Montclair), MA (CUNY)

Introduction

The study of English literature at Dalhousie is not just the study of the literature of England. Although largely concerned with the rich written heritage of the British Isles, it also includes the study of writing in Canada, the United States, parts of the English-speaking Commonwealth and, indeed, some European countries, in translation. It ranges widely in time from early Anglo-Saxon works of the eighth century through thirteen centuries of changing ideas and language to the still-changing thoughts, feelings and expressions of our own time.

The purpose of English studies at Dalhousie, briefly stated, is the enjoyment and understanding of the written word. Since the word is the principal link between the individual heart and mind and the rest of the world, such studies naturally touch upon philosophy, politics, religion, and the fine arts as well. At the same time, the student is required to think, and to use language with clarity, judgement and imagination.

In more detail, the goals of English studies are to encourage reading as a source of pleasure, knowledge and wisdom, to sharpen the powers of critical judgement required to interpret literary texts, to promote some understanding of the process by which great writing is achieved and indeed to inspire students to their own best expression.

In the first year, ENGL 100R is required of all students who wish to take further English classes. There are about twenty different sections ranging from historical surveys to more eclectic studies. To enable students to choose the one most suited to their inclinations and needs, the English Department and the Registrar's Office have an ENGL 100R supplement which specifies the aims and reading lists of each section. Classes numbered from 2000 to 4099 are especially suited for those concentrating in English, studying it as a complement to their main area, or taking an elective, and classes beyond 4250 are designed as studies of specialized areas for Honours students. Honours classes are open to General students with permission of the Chair and the professor concerned. A supplement describing Upper-year General and Honours classes in detail is available from the English Department.

Degree Programmes

The BA with Honours in English

The Honours programme in English offers a systematic study of the major writers and trends from medieval times to our century. It is therefore of particular relevance to the student who is interested in detailed study of English as the basis of a liberal education, to the prospective high-school teacher of English who needs a comprehensive understanding of the subject, and to the student intending to proceed to graduate study in English.

Students hoping to enter the Honours Programme are asked to consult the Department before Year II to plan their classes. A student must have the Chair's permission to take any Honours seminar. Admission to the Honours Programme is granted to those students who apply with the best grades in their English classes.

N.B. In recent years, enrolment pressures have been such that students are not admitted to Honours until their third year. Students hoping to enter Honours are thus advised to choose their second year classes from section G, and to register early in classes that will count towards their Honours degree.

The Honours programme consists of nine classes (in addition to ENGL 0451A) beyond ENGL 1000R. At least one class must be taken from each of the following six sections:

Section A: ENGL 4252R (recommended for third year)

Section B: ENGL 4253R, ENGL 4351R

Section C: ENGL 4251R, ENGL 4352R

Section D: ENGL 4254R, ENGL 4255R, ENGL 4256R, ENGL 4356R

Section E: ENGL 4354R, ENGL 4355R, ENGL 4452R, ENGL 4457R

Section F: ENGL 4357R, ENGL 4453R, ENGL4455R

The student may choose the three remaining classes from those not already chosen in Sections B to F, or from **Section G:** ENGL 2200R, ENGL 2203R, ENGL 2204R, ENGL 2205R, ENGL 2211R, ENGL 2220R, ENGL 2221R, ENGL 2225R, ENGL 2226R, ENGL 2227R, ENGL 2228R, ENGL 2233R, ENGL 2234R, ENGL 3201R, ENGL 3202R, ENGL 3210R, ENGL 3216R, ENGL 3218R, ENGL 3232R, ENGL 3244R, ENGL 4001A or B, ENGL 4002A or B, ENGL 4003A or B, ENGL 4004A or B, ENGL 4005A or B, ENGL 4006A or B, ENGL 4007A or B, ENGL 4008A or B, ENGL 4009A or B, ENGL 4010A or B.

Introduction to Literary Research

ENGL 0451A, a non-credit class which meets one hour per week in the first term, is required of all Honours students and is to be taken in the first year of the Honours programme.

Honours students must meet the requirements for the General BA degree. They are advised to select a minor from one of the subjects listed under either Group A or Group B in the "Academic Programmes" section of the Calendar.

BA with Combined Honours

There are several Combined Honours programmes: English and French, English and German, English and History, English and Philosophy, English and Spanish, English and Theatre. Students interested in any of these combinations or any other that involves English and another subject should consult with the Departments concerned.

BA With Advanced Major in English

The Faculty requires that a student majoring in English in the 20-credit BA programme must successfully complete between six and nine English classes above the 1000 level. The English Department requires:

- (1) at least one half credit in the 4000 series
- (2) at least one class from each of Groups I, II, and III
- (3) three classes above the 2000 series (in keeping with the Faculty requirement)

In addition, the English Department strongly recommends that students take:

- (1) at least two years of language study (or its equivalent) in a single language other than English
- (2) at least two full elective credits above the 1000 level in a single subject area other than English
- (3) at least eight full credits in English above the 1000 level

Students who wish to pursue the Advanced Major and those returning to upgrade their majors by means of the Advanced Major Certificate must secure departmental approval.

The following programme of study is recommended for English majors intending to become teachers of English at the high-school level:

ENGL 2200R Advanced Composition, or ENGL 3201R The English Language, or ENGL 3202R History of the English Language

ENGL 2207R Canadian Literature

ENGL 3214R Shakespeare

ENGL 2228R The Short Poem in English, or ENGL 3215R Romantic Poetry, or ENGL

3210R Modern Poetry in English, or ENGL 3224R Renaissance Poetry, or ENGL 3229R Victorian Poetry.

ENGL 3220R English Drama, or ENGL 2226R Tragedy, or ENGL 2227R Comedy and Satire, or ENGL 3232R Modern Drama

ENGL 2208R English Novel to 1900, or ENGL 3209R Modern Fiction, or ENGL 3212R British Literature of the 20th Century, or ENGL 3213R American Literature of the 20th Century

At least one class chosen from the last three groups should involve a substantial amount of literature written prior to the 20th Century.

The student in the Advanced Major programme may also choose a maximum of three more classes in English.

BA Programme

Students in the 15-credit BA programme must take from four to eight classes in English beyond the 1000 level. The Department expects all of its students to consult with faculty advisors and to form coherent programmes of study; it strongly recommends that these programmes contain at least six classes in English beyond the 1000 level.

English majors must take at least one class from each of the following groups, unless they have departmental permission to use an honours class to meet a group requirement.

GROUP I: ENGL 2207R, ENGL 3209R, ENGL 3210R, ENGL 2211R, ENGL 3212R, ENGL 3213R, ENGL 2221R, ENGL 2231R, ENGL 3232R, ENGL 2233R, 2234R

GROUP II: ENGL 2206R, ENGL 3206R, ENGL 2208R, ENGL 3215R, ENGL 3218R, ENGL 3219R, ENGL 3224R, ENGL 3225R, ENGL 3229R

GROUP III: ENGL 2200R, ENGL 3201R, ENGL 3202R, ENGL 2203R, ENGL 2204R, ENGL 3214R, ENGL 3216R, ENGL 2220R, ENGL 2225R, ENGL 2226R, ENGL 2227R, ENGL 2228R, ENGL 3244R

The purpose of the requirements stated above is to ensure some variety in each student's programme. The Department recommends that the student take at least one class that concentrates on poetry and one that concentrates on fiction, and at least one class from each of two different historical periods. There is, of course, more to a sound programme than variety. From the Department's offerings, students may approach the study of English literature in a number of different ways. They may choose programmes which offer a broad historical background, which focus on specific genres

or which concentrate on specific historical periods such as the 19th or 20th century. There are numerous other possible combinations. In any case, students should give careful consideration to planning their programmes to meet their individual needs and interests, and should consult with their departmental advisor if they need help in doing so.

Classes numbered from 2000 to 4099 (excepting those in section G, above) are not accepted as preparation for Graduate Studies in English. Students who may desire to change to an Honours Programme or continue in Graduate Studies should arrange with their advisor and with the Chair of the Department to complete several Honours classes before graduating with a General BA. It is possible to enter a two-year MA programme on completion of a General BA degree, but only if the student has completed four or five Honours rather than General classes for the concentration and has maintained a high level of academic performance.

Classes Offered

Note: Classes marked * may not be offered every year. Please consult the current timetable on registration to determine if these classes are offered.

ENGL 1000R Introduction to Literature: Since ENGL 1000R consists of sections taught by many different instructors, statements about its objectives and approach must be confined to generalizations. All instructors of ENGL 1000R have these two broad objectives in common: (a) to involve students in the serious study of literature; (b) to involve them in the discipline of words so that they will be more critical and responsive readers and more exact and imaginative writers. The subject matter varies from section to section. Detailed syllabi of all sections are available. Practice in writing is carried on throughout the year in regular essays. Each section attends three lectures per week. In addition, the tutors attached to each session conduct small discussion groups and personal interviews with students.

Format: Lecture/discussion 3 hours
Enrolment: Limited

Classes for General Degree

Successful completion of ENGL 1000R is the prerequisite for entry into Upper-Year classes. For a more complete description of classes and of texts, students should consult the Departmental Supplement for Upper-Year classes.

Classes in the 2000 Series

The 2000 series includes classes that emphasize genre or literary form, and those

that offer broad surveys of literature. Classes in the 2000 series are open to students in their second or third year of studies who have completed ENGL 1000R.

***ENGL 2200R Advanced Composition:** An advanced class in the theory and practice of writing English prose, designed for people who already have some competence and interest in writing. The class is not a "remedial" class and not a "creative writing" class.

Format: Lecture/discussion 3 hours
Prerequisite: ENGL 1000R
Enrolment: Limited

***ENGL 2203R Masterpieces of Western Literature:** Intensive reading of selected major works from Western literature, designed to broaden students' outlook on literature and also to increase their familiarity with works that are not only stimulating in themselves but also comprise the basis for the development of English and other literatures.

Format: Lecture/discussion 3 hours
Prerequisite: ENGL 1000R
Enrolment: limited

***ENGL 2204R The European Novel:** An intensive study of about ten representative European novels of the last two hundred years. A considerable amount of attention is paid to the philosophical ideas which are an important feature in many of the novels studied.

Format: Lecture/discussion 2 hours
Prerequisite: ENGL 1000R
Enrolment: Limited

***ENGL 2205R Landmarks of English Literature:** This class studies works by many of the most influential British authors from Chaucer to the present century. These landmarks provide some orientation in the literary landscape, and help to make students aware of the diversity available in literary studies. The class is aimed at, but not limited to, English majors.

Format: Lecture/discussion 3-4 hours
Prerequisite: ENGL 1000R
Enrolment: Limited

***ENGL 2207R Canadian Literature:** This class offers an introduction to Canadian poetry and prose written in English. The aim will be to trace the development of Canadian fiction and poetry from the nineteenth century to the present through discussion of selected texts.

Format: Lecture/discussion 2 hours
Prerequisite: ENGL 1000R

Cross-listed: Canadian Studies

Enrolment: Limited

***ENGL 2208R The English Novel to 1900:** Based on a selection of titles by representative authors, this class is a survey of the early English novel. Attention is given

to the rise of the genre as well as to the variety of forms and functions which the novel assumed or served.

Format: Lecture/discussion 2 hours
Prerequisite: ENGL 1000R
Enrolment: Limited

***ENGL 2211R Commonwealth Literature:** An introduction to the literature of the British Commonwealth, emphasizing writing from Africa, Australia, the Caribbean and India. The bulk of the literature studied will be modern.

Format: Lecture/discussion 2 hours
Prerequisite: ENGL 1000R
Enrolment: Limited

***ENGL 2220R English Drama:** An introduction to some of the major plays and playwrights in the history of English drama. The ability to interpret a dramatic text is of principal concern; some attention may be paid to changes in staging practices from the medieval beginnings of English drama to the recent experimental theatre. The objective of the class as a whole is to sample the richness and diversity of the English dramatic tradition.

Format: Lecture/discussion 2 hours
Prerequisite: ENGL 1000R
Enrolment: Limited

***ENGL 2221R Fictions of Development:** A study of a variety of literary works (chiefly novels) which portray the crises and conflicts involved in growing up, finding a vocation, and finding oneself. Works from the nineteenth century to the present by Canadian, English and American authors are included, and special attention is given to the connections between art and autobiography, and between literature and psychology, as well as to the influence of gender differences in patterns of human development, and ways of writing about them.

Format: Lecture/discussion 2 hours
Prerequisite: ENGL 1000R
Cross-listed: Women's Studies 2200R
Enrolment: Limited

***ENGL 2225R Epic, Romance, and Fantasy:** This class offers a consideration of epic, romance, and fantasy. Starting with a consideration of primary epics, it will then go on to take a look at manifestations of the epic spirit in modern works.

Format: lecture 2 hours
Prerequisite: ENGL 1000R
Enrolment: Limited

***ENGL 2226R Tragedy:** A study of the nature and method of tragedy in literature. Examples are taken from Greek, Shakespearean, and modern drama, as well as from poetry, and from novels.

Format: Lecture/discussion 2 hours
Prerequisite: ENGL 1000R
Enrolment: Limited

***ENGL 2227R Comedy and Satire:** The comedian and the satirist are interested in both the laughable and the deplorable antics and eccentricities of human nature. This class concerns itself with their points of view, as expressed in such varied forms as stage comedy, graphic satire, the comic novel, and the humorous essay. It also considers theories of comedy and laughter in their application to a wide variety of literary types. Lectures and class discussions are augmented with play readings, films and other illustrative materials.

Format: Lecture/discussion 4 hours
 Prerequisite: ENGL 100OR
 Enrolment: Limited

***ENGL 2228R Short Poems in English:** Forms and themes in the short poem are studied by means of critical reading of poems written in English. Topics may include the following: the self in the short poem, other persons, public events, love, nature, the city, the machine, wit, myth, traditional forms, free verse, the haiku, lyric as song, spoken poetry, poetry in print, concrete poetry, and possibly other topics to suit the class.

Format: Lecture/discussion 2 hours
 Prerequisite: ENGL 100OR
 Enrolment: Limited

***ENGL 2231R Modern American and Canadian Novels:** Six Canadian and six American novels are treated as related "pairs", with a view to discovering what qualities are distinctive to each group, and what qualities are shared.

Format: Lecture/discussion 2 hours
 Prerequisite: ENGL 100OR
 Enrolment: Limited

***ENGL 2233R Science Fiction and Fantasy:** Selected works of speculative fiction are read for pleasure and studied for understanding. The study emphasizes analysis and evaluation of the works as literature. Non-majors are welcome.

Format: Lecture/discussion 2 hours
 Prerequisite: ENGL 100OR
 Enrolment: Limited

***ENGL 2234R The Short Story:** This class attempts to combine detailed consideration of a wide range of the best short stories of the last 150 years with discussion of general questions about the nature of the genre itself. As much as anything else it is a class in 'reading and writing' intended to improve reading ability and to develop the capacity to understand and interpret literature.

Format: Lecture/discussion 2 hours
 Prerequisite: ENGL 100OR
 Enrolment: Limited

Classes in the 3000 Series

The 3000 series includes classes that focus on periods in national literatures, that

take up the descriptive and historical study of the English language itself, and that deal with the theory and history of literary study. Classes in the 3000 series are open to any student who has completed ENGL 100OR.

***ENGL 3201R The English Language:** This class, concerning the English language of today, begins with some general questions about the nature of language, and goes on to investigate the syntax, semantics, phonology, and dialects of modern English, with an ultimate interest in the stylistic analysis and comparison of short literary texts.

Format: Lecture/discussion 2 hours
 Prerequisite: ENGL 100OR
 Enrolment: Limited

***ENGL 3202R History of the English Language:** An introduction to the historical development of the English language. The growth of our "word-hoard", the evolution of word meanings, the changing patterns of speech sounds, of word forms and of syntactic structures, the distinction of dialects and literary styles are studied through analysis of selected literary texts. ENGL 3201R and ENGL 3202R are complementary classes.

Format: Lecture/discussion 2 hours
 Prerequisite: ENGL 100OR
 Enrolment: Limited

***ENGL 3206R American Literature of the Nineteenth Century:** An introduction to American literature through representative works by major writers from 1800 to 1900. Among those studied are Cooper, Hawthorne, Poe, Emerson, Melville, Whitman, Dickinson, and Twain. Both fiction and poetry are studied. Students are encouraged to discuss the works, and classes usually proceed by a combination of discussion and lecture.

Format: Lecture/discussion 2 hours
 Prerequisite: ENGL 100OR
 Enrolment: limited

***ENGL 3209R Twentieth-Century Fiction:** An introduction to the main thematic and technical trends in the modern novel.

Format: Lecture/discussion 2 hours
 Prerequisite: ENGL 100OR
 Enrolment: Limited

***ENGL 3210R Modern Poetry in English:** A study of modern poetry in English focussing on the seminal poets Yeats, Stevens, Pound, Eliot, and Williams. Developments and trends in poetry from the 1930's to the present are also considered. For readers, beginning and more experienced, who wish to get their bearings in modern poetry.

Format: Lecture/discussion 2 hours
 Prerequisite: ENGL 100OR
 Enrolment: Limited

***ENGL 3212R British Literature of the Twentieth Century:** A survey introduction to the past seventy-five years of British fiction, drama, and poetry.

Format: Lecture/discussion 2 hours

Prerequisite: ENGL 1000R

Enrolment: Limited

***ENGL 3213R American Literature of the Twentieth Century:** An introduction to poetry, fiction and drama by American writers of the twentieth century.

Format: Lecture/discussion 2 hours

Prerequisite: ENGL 1000R

Enrolment: Limited

***ENGL 3214R Shakespeare:** An introduction to Shakespeare's career as a playwright, through discussion and interpretation of a dozen or more of his plays.

Format: Lecture/discussion 2 1/2 hours

Prerequisite: ENGL 1000R

Enrolment: Limited

***ENGL 3215R Poetry of the Romantic Period:** An introduction to the spirit of an age and its manifestations in literary art. Examples of shorter and longer lyrics and excerpts from longer narrative and dramatic poems are drawn from the works of Blake, Wordsworth, Coleridge, Byron, Shelley, and Keats.

Format: Lecture/discussion 2 hours

Prerequisite: ENGL 1000R

Enrolment: Limited

***ENGL 3216R The Gothic Novel:** A survey of the origins and development of The Tale of Terror and the Supernatural during the latter half of the eighteenth century and its various manifestations and influences in succeeding fiction. Students will not only chart the chief landmarks of gothic fiction but also explore the various chambers of horror-literature.

Format: Lecture/discussion 2 hours

Prerequisite: ENGL 1000R

Enrolment: Limited

***ENGL 3218R Medieval Literature:** A study of selected medieval works of Northern Europe, with major emphasis upon the Arthurian legend as found in Malory. Beginning with a look at Nordic, Celtic and Frankish background materials (in translation), one goes on to focus upon late-medieval developments in saga and romance, concluding with a look at some post-medieval uses of the inherited matter in Tennyson, Morris, Lewis and Tolkien. An enriched ENGL 3218R is available for Honours credit to students who have previously taken ENGL 4351R.

Format: Lecture/discussion 2 hours

Prerequisite: ENGL 1000R

Enrolment: Limited

***ENGL 3219R Chaucer and his Contemporaries:** A selection from the genres of late medieval literature in English: romances, fabliaux, plays, lyrics, and legends. Some works are studied in translation; others (including Chaucer's) are read in the original Middle English.

Format: Lecture/discussion 2 hours

Prerequisite: ENGL 1000R

Enrolment: Limited

***ENGL 3224R Renaissance Poetry:** An introduction to English poetry from the early sixteenth to the mid-seventeenth century, concentrating on authors whose works have exercised a continuing influence: Sidney, Shakespeare, Donne, Jonson, and Milton.

Format: Lecture/discussion 2 hours

Prerequisite: ENGL 1000R

Enrolment: Limited

***ENGL 3225R Restoration and Eighteenth-Century Literature:** This class will survey literary works in drama, poetry and prose from 1660-1800. Topics to be considered might include the risky business of irony, the rise of the novel, the rise and fall of the heroic couplet, the professionalization of English letters and the changing functions of the poet, the obstacles faced by early women writers, and the relation of literature to politics in an age of emerging democratic capitalism.

Format: Lecture/discussion 2 hours

Prerequisite: ENGL 1000R

Enrolment: Limited

***ENGL 3229R The Victorian Age:** A survey of selected Victorian texts designed to deconstruct modern myths about the Victorians and to introduce students to the diversity of the Victorian Age. Works by Mill, Tennyson, Arnold, the Brownings, the Pre-Raphaelites, and Wilde demonstrate that Victorian Literature is animated by a spirit of rebellion and a zest for controversy, marked by innovation and experimentation in literary forms and subjects, and notable for both its passionate defences of individual liberty and its surprisingly modern affirmations of women's rights.

Format: Lecture/discussion 2 hours

Prerequisite: ENGL 1000R

Enrolment: Limited

***ENGL 3232 Modern Drama:** An introduction to the major developments in drama from Ibsen to the present. Special attention is given to changes in dramatic style and to the growth of modern theatrical movements. The playwrights represented include Strindberg, Shaw, Pirandello, Brecht, Genet, Ionesco, Pinter, Albee, and Stoppard. A few recent Canadian plays provide a focus for discussion of contemporary trends.

Format: Lecture/discussion 2 hours

Prerequisite: ENGL 1000R

Enrolment: Limited

*ENGL 3244R **Literary Criticism: A survey of Classical Greek and Latin theory, English critics and some pertinent European writers and trends.**

Format: Lecture/discussion 2 hours

Prerequisite: ENGL 1000R

Enrolment: Limited

Classes in the 4000 Series

Classes in the 4000 series focus on more specialized topics than other classes in the major programme. They are designed for the more experienced student of literature and are open to English advanced majors in their third or fourth years. These classes will be organized as seminars and will have a lower enrolment than other major programme classes. Their specific subject matter will vary year-to-year.

You must have permission from the Undergraduate Advisor to take classes in this category.

*ENGL 4001A or B **Studies in an Individual Author I**

*ENGL 4002A or B **Studies in an Individual Author II**

*ENGL 4003A or B **Studies in Genres I**

*ENGL 4004A or B **Studies in Genres II**

*ENGL 4005A or B **Studies in National Literatures in English I**

*ENGL 4006A or B **Studies in National Literatures in English II**

*ENGL 4007A or B **Studies in Literary History I**

*ENGL 4008A or B **Studies in Literary History II**

*ENGL 4009A or B **Studies in Literary Theory I**

*ENGL 4010A or B **Studies in Literary Theory II**

Classes for the Honours Degree

You must have permission from the Chair of the Department to take classes in this category.

ENGL 0451A **Introduction to Literary Research: A departmental (i.e., non-university and non-credit) technical class for honours and graduate students. It is planned to acquaint the student with certain research tools in the library that are most frequently used by students of English (bibliographies, catalogues, indices, digests, journals, dictionaries, microfilms), many of which the student is unlikely to stumble upon in his/her own research.**

There will be a brief introduction to the history of printing and papermaking. Students will be taken on a tour of the printing shop (Dawson Room) and occasionally guest speakers will lecture on relevant topics. Successful completion of exercises and attendance at lectures one hour a week for the first term will constitute fulfillment of requirements for the class.

Format: Lecture 1 hour, first term only

*ENGL 4251R **Sixteenth-Century Prose and Poetry: This is a class in the prose and poetry of the English Renaissance from its beginnings to the 1590s. The major writers to be studied are More, Sidney, Spenser, and Shakespeare; brief selections from Wyatt, Surrey, Elyot, Ascham, Hooker, Marlowe and a few others will also be read.**

Format: Seminar 2 hours

Enrolment: Limited to Honours students in English

*ENGL 4252R **Shakespeare and the Drama of His Time: A selection of plays by Shakespeare, is placed in the context of representative plays by his earlier and later contemporaries, especially Marlowe and Jonson. Students may consult the professor for a list of plays and suggested preliminary reading.**

Format: Seminar 2 hours

Enrolment: Limited to Honours students in English

*ENGL 4253R **Old English: An introduction to the Old English language (700-1100 AD), followed by a study of some of the prose and minor poems, and, in the second term, of Beowulf. Students are also introduced to some aspects of Old English art and archaeology. Some knowledge of a classical or modern European language (preferably German) is desirable, though not essential, and an understanding of traditional grammatical terminology will be helpful. This class is not recommended, except in unusual circumstances, to those who are not thoroughly fluent in modern English.**

Format: Seminar 2 hours

Enrolment: Limited to Honours students in English

*ENGL 4254R **Restoration and Eighteenth-Century Literature: The emphasis is on three great satirical authors (Dryden, Pope, and Swift), on a study of Restoration drama and on major works of Samuel Johnson. Since the literature of the period is related closely to the culture of the age, some time is spent on the contemporary climate of opinion revealed in the works of a number of writers representative of literary, political, social, and philosophical points of view: Hobbes, Halifax, Pepys, Rochester, Butler, Addison and Steele, Mandeville and Shaftesbury.**

Format: Seminar 2 hours
Enrolment: Limited to Honours students
 in English

***ENGL 4255R Poetry and Prose 1660-1800:**
 This seminar will examine a selection of poetry and non-fictional prose from the Restoration and Eighteenth Century. Although the works of Dryden, Pope, Swift and Johnson will be emphasized, attention will also be paid to a number of works in representative genres (E.G., biography, letters, essays). Time will be spent on some lesser known poets of period, such as the women poets and the poets of sensibility.
Format: Seminar 2 hours
Enrolment: Limited to Honours students
 in English

***ENGL 4256R The Novel from Behn to Austen:** This seminar will examine the development of narrative fiction during the Restoration and the eighteenth century. Selected works will include a number of novels, well-known and not so well-known. Topics might include the constructions of gender, the rise of individualism, changing concepts of realism, and the relation between history and fiction.
Format: Seminar 2 hours
Enrolment: Limited to Honours students
 in English

***ENGL 4351R Middle English:** An introduction to the language and literature of feudal and chivalric England, with the principal emphases being upon Chaucer's poetry and upon the Arthurian story. Through readings and study, the student should gain some historical sense of the language, of the late-medieval social milieu and of the especial flourishing of literature in the late-fourteenth century.
Format: Seminar 2 hours
Enrolment: Limited to Honours students
 in English

***ENGL 4352R Seventeenth-Century Poetry and Prose:** A study of selected poetry and prose of the later Renaissance. Of the poets, Donne and Milton are given special emphasis; Milton's poetry, especially *Paradise Lost*, occupies a major part of the second term.
Format: Seminar 2 hours
Enrolment: Limited to Honours students
 in English

***ENGL 4354R Nineteenth Century Novel:** The novels of the period from Scott and Austen to Hardy are studied.
Format: Seminar 2 hours
Enrolment: Limited to Honours students
 in English

***ENGL 4355R American Literature to 1900:**
 This class deals with major writers of the

19th century, as well as works from the colonial period which raise important cultural questions.

Format: Seminar 2 hours
Enrolment: Limited to Honours students
 in English

***ENGL 4356R The Romantic Period:** A close reading of the major poetry of Blake, Coleridge, Wordsworth, Byron, Shelley, and Keats. Attention is also given to their critical writings in prose, and to the intellectual, cultural, and historical milieu in which they worked.
Format: Seminar 2 hours
Enrolment: Limited to Honours students
 in English

***ENGL 4357R Modern Canadian Literature:** A study of Canadian fiction and poetry since the 1920's with emphasis on the changing form and content of Canadian writing.
Format: Seminar 2 hours
Cross-listed: Canadian Studies
Enrolment: Limited to Honours students
 in English

***ENGL 4360C Old Norse:** A broad survey of major Old Norse prose and poetic works in translation and an introduction to the comparative study of the very close relation of the early Norse and English languages and literature.
Format: Lecture 1 hour
Prerequisite: One of ENGL 3218R, 4253R, 4351R or instructor's consent

***ENGL 4453R Twentieth-Century English Literature:** A series of explorations designed to interpret some of the literary texts written in our country and the (British) culture which produced them.
Format: Seminar 2 hours
Enrolment: Limited to Honours students
 in English

***ENGL 4455R Modern American Literature:** In the first term, this class studies 20th-century American fiction. In the second term, modern American poetry is assessed. Classes are a combination of lectures and discussion.
Format: Seminar 2 hours
Enrolment: Limited to Honours students
 in English

***ENGL 4457R Victorian Poetry:** Poems by Tennyson, Robert Browning, Elizabeth Barrett Browning, Arnold and selected Pre-Raphaelites are studied in the context of the social and political, the religious and scientific ideas current in Victorian England.
Format: Seminar 2 hours
Enrolment: Limited to Honours students
 in English

Environmental Science

Introduction

Environmental Science applies the findings and principles from all disciplines of science to questions and problems involving the environment of our planet, its oceans, atmosphere, and biosphere. Environmental science is therefore extremely broad and interdisciplinary. Most environmental scientists have primary expertise in a particular discipline, and work co-operatively with specialists in other disciplines to solve environmental problems. They work in a variety of institutions; many work in federal or provincial government laboratories that are engaged in basic research or applied problem-solving. Many more work in private consulting or engineering firms to minimize man's impact on the environment.

Degree Programmes

Dalhousie University does NOT offer a B.Sc. major in environmental science, nor is there such a Department within the Faculty of Science. Those interested in environmental science as a career are strongly advised to obtain a good grounding in the basic sciences by concentrating their field of study in one subject in order to obtain a major or honours B.Sc. in that discipline. Current programs that provide streams emphasizing environmental subjects are Earth Sciences (particularly Environmental Geology and Hydrogeology) and Marine Biology.

Most major or honours programmes allow some freedom in selection of classes, especially with respect to elective classes. In order to assist students in locating classes with particular applications or relevance to environmental issues, we have listed those classes offered within the Faculty of Science, and noted those aspects of each class which relate to the environment. We emphasize that these classes are offered by individual departments, and do not of themselves form part of a general environmental degree program. Consult the individual departments for prerequisites and admission requirements. Above all, be sure that the selection of classes you choose will be sufficient to qualify for a major or honours Bachelor of Science degree in the subject you have chosen for specialization (Note College of Arts and Science section of "Degree Requirements" in this calendar).

After the B.Sc. degree, career options you may wish to consider include:

- Diploma in Meteorology (Consult the Physics or Oceanography departments)

- Graduate study in Oceanography
- Masters degree programme with the School for Resource and Environmental Studies

Classes Offered Within the Faculty of Science with Particular Relevance to Environmental Science

First-year classes (1000 level):

CHEM 1000R - The Chemical World: This class is mainly for B.A. students. It emphasizes descriptive chemistry, i.e. properties of chemical compounds, over quantitative aspects. Many examples and assignments are relevant to environmental science. Principles demonstrated include chemical structure - function relations; quantity/quality considerations for chemicals in the environment; toxicity. Students will be taught to recognize chemical structure and function.

Instructors: T.S. Cameron

CHEM 1010R, 1030R - Chemistry: These classes are standard 1st-year University chemistry. Both quantitative and qualitative aspects of chemistry are emphasized, and many examples used in class are taken from environmental science. All material covered in these classes is relevant to an understanding in particular of chemicals, cycles, pollution, etc.

Instructors: Staff

CHEM 1040R General Chemistry for the Life and Health Sciences: This course is similar to CHEM 1010 in its rigour and the principles it covers; it also uses the same textbook and the same lab experiments. CHEM 1040 serves as a prerequisite for all second-year chemistry courses, and students should have a background equivalent to Nova Scotia grade 12 chemistry.

In contrast to CHEM 1010, however, chemical principles are primarily illustrated by their action in living systems. Of particular interest in the environmental context may be: descriptions of the nature and role of particular chemicals (from O_3 , NO_x , and SO_2 to select carcinogens and biodegradable surfactants); Michaelis-Menten enzyme kinetics (including non-competitive inhibition by Hg and nerve gases); consequences of the second law of thermodynamics (e.g. entropy-driven pollution); methods used in biochemical and environmental analysis (UV-Vis spectrophotometry, pH measurements, etc.); polyprotic acid equilibria (natural buffer systems); and ionizing radiation (effects on the human body, natural and anthropogenic radioactivity, fission and fusion reactors and bombs).

Prerequisites: Students should have a background equivalent to Nova Scotia grade 12 chemistry (N.S. #411)

Current instructor: A. Aue

CHEM 1410A - Introductory Chemistry: A descriptive introduction to chemistry with emphasis on materials related to life and health sciences. As 1430R, the course is required for Nursing students, who make up the bulk of the class. Consequently, there is an emphasis on the physiological effects of chemicals on the human body. The class consists of three hours of lectures and an optional two-hour tutorial each week. The class discusses the structure of chemical compounds, concentrations of solutions, inorganic and organic compounds, reactions and non-reactive interactions between chemicals. The students learn how to work with concentrations of solutions and how to deduce the structure and something of the properties of a molecule from its name.

Instructors: P.D. Pacey

Cross-listings: CHEM 1430R

ESCI 1000R/1001B - Introduction to Geology: Covers principles of Earth Science including those directly applicable to environmental science - e.g. nature and coupling of lithosphere-hydrosphere-atmosphere-biosphere, rock cycle, geological time, stratigraphy, geological processes and surficial geology, extinctions, scientific method. Applies principles of Earth Science to problems in environmental and resource geology - e.g., mineral and petroleum resources (including environmental problems associated with their recovery and use), groundwater, waste disposal, soils, deserts and desertification, the carbon cycle, glaciation, history and causes of climate change, rivers and floods, slope failure, coastal subsidence, volcanic and earthquake hazards. Lectures cover points noted above, with special class reading and discussion of several topical environmental issues. Field trips illustrate different aspects of geology, including environmental aspects as appropriate for each locality (e.g., shoreline erosion). Labs include the analysis and identification of sediments and rocks, and coverage of the physical basis of the Earth's surface. Students are taught geological time and the time scale; how to read the history of past environmental change from the geological record; specific geological principles (e.g., groundwater flow, the carbon cycle, slope stability) relevant to environmental science, map reading. For more course content information refer to the Earth Sciences section of this calendar.

Instructors: F. Medloli, N. Culshaw

ESCI 1040A/1050B - The Earth and Society: 1040A covers principles of Earth Science including those directly applicable to environmental science (applications mainly covered in 1050B) - e.g., nature and coupling of lithosphere- hydrosphere- atmosphere- biosphere, geological time, rock cycle, stratigraphy, geological processes and surficial geology, extinctions, scientific method. Lectures cover points noted above. Field trips illustrate different aspects of geology, including environmental aspects as appropriate for each locality (e.g., shoreline erosion). Students are taught understanding of geological time and the time scale; how to read the history of past environmental change from the geological record.

1050B applies principles of Earth Science learned in 1040A to problems in environmental and resource geology - e.g., mineral and petroleum resources (including environmental problems associated with their recovery and use), groundwater, waste disposal, soils, deserts and desertification, the carbon cycle, glaciation, history and causes of climate change, rivers and floods, slope failure, coastal subsidence, volcanic and earthquake hazards. A large proportion of class time is spent on environmental applications of Earth Science, with some special reading and discussion on topical environmental problems; three out of four assignments involve problems or reports on environmental/resource geology. Students are taught specific geological principles (e.g., groundwater flow, the carbon cycle, slope stability) relevant to environmental science, map reading. For more course content information refer to the Earth Sciences section of this calendar.

Instructors: D. Godfrey-Smith, P.J.C. Ryall, J. Hall

SCI 1000R Introduction to Environmental Studies: The intention of this full-credit course is to provide students with an entry-level introduction to the scope and importance of environmental issues that affect us at the local, regional, national and global levels. The course content will deal with three groups of environmental issues; (i) the human population and sociocultural patterns, (ii) sustainability of the use of renewable and non-renewable natural resources, and (iii) environmental degradation caused by pollution and disturbance. The course will be multi-disciplinary in nature, with specialists dealing with issues that reflect their particular expertise. However, this course will also build upon the connections among specific disciplines. The instructional format will involve two lectures per week, and one two-hour tutorial every two weeks. Grading will be by examination

(one at the end of each term), by essay (one per term), by short written assignments, and by participation in discussion seminars.

Instructors: Staff
Enrollment: 100

SCI 1200R: Science for Non-Science Students: An Overview of the Cosmos, Earth, and Life: The class meets the science distribution requirement for BA students. There are no prerequisites and the class does not count as a prerequisite for any other science class. Students are introduced to selected concepts central to each of the disciplines of Geology, Biology, and Physics, and the origins of our universe, Earth and life on Earth. Emphasis is placed on developing an understanding of the scientific method, its limitations, and its application in society. The principles will be related to environmental concerns. For example the properties of light and radiation are applied to a discussion of global warming. The principles involved in ocean and atmospheric circulation are used to understand present problems of climate and pollution. Biological principles are applied to understand the consequences of changing habitats on biodiversity.

Instructors: E. Angelopoulos, P. Reynolds, R. March
Cross-listings: ESCI 1200R, PHYC 1200R, BIOL 1200R

Second-year classes (2000 level)

BIOL 2002B Terrestrial Diversity: (Area II) A survey of the terrestrial organisms. The class emphasizes the restrictions imposed on terrestrial adaptations by the aquatic origins of the colonizers, discusses the physiology of living in a terrestrial environment, looks at the domestication of plants and animals by man, and speculates on the future diversification of the earth environment and its inhabitants.

Format: lecture 2 hr, tutorial 1 hr, lab 3 hr

Instructors: A.H. Mille, D.G. Patriquin, R. Scheibling
Prerequisite: BIOL 1000R or 1001R (Grade C or better)

Enrollment: 140

BIOL 2080A or B Introductory Ecology: (Area III) Ecology is the study of the interrelationships of organisms and their environments. The broad subject of ecology focuses upon the interactions of plants and animals, including humans, with each other and with their non-living world. Three levels of ecology are studied: (1) individuals, (2) Populations, (3) Communities and Ecosystems. Assignments and tutorials enlarge upon concepts presented in lecture. Students are instructed in elementary computer techniques and use the computer for most assignments. This class provides an overview of the science of ecology for the

informed citizen, and also a good foundation for further work in ecology, marine biology and environmental studies.

Format: lecture 3 hours, laboratory/tutorial 3 hours
Instructor: C. Beauchamp, R. Doyle, R. Scheibling
Prerequisite: BIOL 1000R or 1001R (Grade C or better)
Exclusions: BIOL 2066, BIOL 2046R
Enrollment: limited to 150 (25/laboratory)

ECO 2250R An Applied Course in Economic Development and the Environment: Concepts, Policies and Projects: The class is designed around concepts of sustainable development, with emphasis on key issues facing developing countries and less prosperous regions of some industrial nations. There are three main elements: (1) conceptual underpinnings and tensions behind sustainable development; (2) international, national and regional level policies and planning approaches for sustainable development - including lessons from the Rio Summit, the World Bank, CIDA, Canada's Green Plan and the European Regional Development Fund; (3) projects for sustainable development - drawing on case experiences and first-hand field work undertaken as a part of the class programme.

Format: Lectures, case work with group presentations, tutorials. (3 hours).
Instructor: Ian McAllister
Prerequisite: Introductory economics or permission of instructor.

ESCI 2201A/2202B - Historical Geology: This class will cover fundamental global change issues - i.e. from the beginning of time. The student can put these in the context of present global change and assess the differences. Also studies changes in the earth's environment as the earth evolved from a lifeless planet to the present. Principles demonstrated include stratigraphic principles, the present is the key to the past, evolution of all the various life forms. This will be covered in both labs and classroom. Students will be able to place anthropogenic induced changes in context with naturally occurring global change. For more course content information refer to the Earth Sciences section of this calendar.
Instructors: P. Sohen
Prerequisites: ESCI 1000R or ESCI 1040A and ESCI 1001B. ESCI 2201A for ESCI 2201B.

ESCI 2410B - Environmental and Resource Geology: Today, and into the foreseeable future, humanity is faced with numerous environmental problems created by natural and human-made causes. In many cases, an understanding of one or more geologic

processes is essential in finding an appropriate solution. Environmental geology is geology as it relates to human activities. This course examines how geologic processes and hazards impose constraints on human activities, the geologic aspects of pollution and waste-disposal problems, the issues associated with the utilization and management of mineral and energy resources, and several other topics. Principles and applications addressed in the course include metallic mineral resources, energy resources (coal, hydrocarbons, nuclear), environmental problems of resource extraction and processing, groundwater as a resource, geologic hazards (flooding, landslides, subsidence, earthquakes, volcanoes) and their mitigation or prevention, role of geology in land use planning, coastal processes and human intervention, geological aspects of solid and liquid waste disposal. Many environmental issues involve a variety of geologic processes. This course provides participants with a broader foundation for the discussion and evaluation of specific environmental issues that involve geologic aspects. Emphasis is placed on the multi-disciplinary nature of environmental sciences and the holistic approach necessary to provide acceptable solutions. For more course content information refer to the Earth Sciences section of this calendar.

Instructors: G.K. Muecke

Prerequisites: ESCI 1000R or ESCI 1040A and 1050B/1001B

STATS 2080A/B - Statistical Methods for Data Analysis and Inference: Statistics is the science of collecting, organizing and interpreting data. It is a particularly essential tool in the study of environmental science. This course gives a fundamental background and techniques in collection and interpretation of data. Principles demonstrated include the importance of experimental design in approaching environmental problems and basic techniques of exploratory data analysis and statistical inference. Students are taught critical analysis and assessment of data used in support of environmental issues.

Instructors: Hamilton, Garner, Bowen

Cross-listing: MATH 2080

OCEA 2860R - Introduction to Oceanography: This course is descriptive in nature. An understanding of the ocean's role as a dominant environmental force is emphasized. Various examples of the importance of the oceans occur throughout.

Instructors: Fournier

Third-year classes (3000 level)

BIOL 3060B - Environmental Ecology: This class covers the ecological effects of pollution and disturbance, plus some resource ecology and human population biology. Ecological effects of pollution and disturbance are emphasized. Skills taught include interpretation, some calculation/budget skills.

Instructors: B. Freedman

Cross-listings: ES5120B, BIOL 5060B

BIOL 3063B - Resource Ecology: This course is concerned with fisheries, wildlife and forest management. Principles demonstrated include geoeconomics, geological control strategies, and genetic conservation strategies. Students are taught familiarisation with the technical literature in several fields.

Instructors: R. Doyle, S. Walde, B. Freedman

BIOL 3066A Plant Ecology: Various topics within the field of Plant Ecology are discussed. At the ecosystem level, we deal with the cycling of energy and significant nutrients, and with successional changes in these processes. At the autecological level we deal with plant population biology, resource allocation, and physiological ecology. The plant environment is described in terms of energy budgets, soils, and water availability.

Format: lecture 2 hours, laboratory 3 hours, one/two field trips on weekends

Instructor: staff

Prerequisite: BIOL 2080

Enrolment: no limit

BIOL 3069A Population Ecology: An examination of selected topics in population ecology. Topics include the effect of species interactions (predation, competition, mutualism) on population fluctuations, cycles and extinction. The relevance of theory to particular case studies such as lynx-hare cycles and biological control of winter moth will be discussed. Recent literature will be emphasized. Written assignments and exams will contribute to the final grades.

Format: lecture/tutorial 3 hours

Instructor: S. Walde

Prerequisites: Introductory Ecology, MATH 1010, 1080, or equivalent

Enrolment: 35

BIOL 3601A Nature Conservation: The course traces the development of human economy and the resultant impact on the wild environment. Particular attention is paid to human population dynamics, biotic extinctions and land-use patterns. Having identified the causes of impoverishment of biodiversity, the course examines possible

courses, including: sustainable development, conservation science and environmental ethics. Special attention is paid to the establishment and management of protected areas.

Format: lecture, tutorial

Instructor: M. Willson

Prerequisites: BIOL 1000 or BIOL 1001 or SCI 1200 or permission of instructor.

Enrolment: 150

CHEM 3402A Identification of Organic Compounds: This is a class designed to teach skills in the identification of Organic Compounds. The Earth has been composed of chemicals since its beginning, and as both nature and man evolve, the range of these continues to increase. The state of the environment around us directly corresponds to its chemical composition and understanding this state therefore requires a knowledge of chemistry. Many substances encountered in the environment are organic molecules and the study of their chemistry is thus important.

The approach used in this class is two-pronged, one using older, classical methods and the other using modern spectroscopic methods. The purpose of studying the older techniques is that they will give valuable experience in the very subjective ability of handling comfortably a wide variety of chemicals. Chemicals have discrete and measurable physical properties. However, the reaction of human beings to many chemicals is a subjective and variable phenomenon - one person may find a certain smell unimportant where someone else may find it repulsive, for example, a pair of well-worn socks. Most people are only comfortable in situations with which they are familiar, and the same is true of handling chemicals - familiarity is crucial in learning how to handle these with confidence (but not with contempt!). This is particularly important in this age of chemophobia since the world needs competent, qualified chemists who can handle molecules with confidence and skill. Students need to acquire the skill of being able to recognize molecules from their appearance, from their smell and from their reactivity, also the skill of knowing how to handle them safely and efficiently. In addition, students need to become comfortable with the powers and limitations of modern analytical procedures. Most substances in real life are mixtures and hence skills at analysis and understanding interactions between compounds in mixtures is fundamentally important to the practice of chemistry. Of course, this also requires modern instrumental methods, the study of which will form the culmination of the skills taught earlier in the class.

Prerequisite: A good understanding of the principles taught in Chemistry 2400, as evidenced by a grade of at least C.

ECO 3350A/B - Social Cost Benefit Analysis:

This class covers valuation of costs and benefits that are not priced in markets and methods for including such costs and benefits in economic decisions. These costs and benefits may be important in evaluating environmental issues. Principles demonstrated include implications of costs and benefits that do not have market values for various projects and differences between private and social perspectives in assessing projects. Students are taught methods of incorporating environmental concerns in economic analysis and implications of ignoring such concerns.

Instructors: T. Pinfold

Cross-listing: ECON 5350B

ECO 3332A/B - Resource Economics:

This class covers resource management decisions - fisheries, forestry, etc. and pollution control regulations - standards versus taxes, etc. Principles demonstrated include optimal sustainable yield - fisheries; and forestry rotation periods. Students are taught applications of economic decision making to resource management and pollution regulation.

Instructor: M. Cross

ESCI 3400A - Fundamentals of

Hydrogeology: The availability and preservation of sources of potable, fresh water is a major environmental concern. As surface waters have increasingly become polluted, exploration and exploitation of groundwater resources have gained in importance. This course deals with subsurface waters and related geologic aspects of surface waters. The student is introduced to the factors which influence the availability of groundwater, such as the presence of suitable aquifers, water quality, and rate of recharge relative to rate of water use. The geology, geophysics, and geochemistry of groundwater systems can be protected from contamination and, in the case of already polluted aquifers, how they can be restored for future use. Principles discussed in the course include: the hydrologic cycle, principles of groundwater flow, groundwater flow to wells, regional groundwater flow, methods of groundwater exploration, geology of groundwater occurrences, geochemistry of subsurface waters, chemical and physical transport mechanisms in groundwater, water quality, groundwater contamination by point and nonpoint sources, groundwater restoration. Atmospheric and aquatic transport of contaminants are the two major pathways

through which harmful pollutants become dispersed. An understanding of groundwater systems and their interaction with surface waters is essential in the study and evaluation of most environmental issues. For students specializing in hydrogeology/environmental geology the course is a pre-requisite for advanced level studies. For more course content information see Earth Sciences section of this calendar.

Instructors: G.K. Muecke, P.J.C. Ryall
 Prerequisites: ESCI 2201A, 2101A, 2102B

ESCI 3410B - Enhanced Environmental Geology: The topics and principles treated in this course are similar to those of ESCI 2410B. The course is designed specifically for students with a strong background in geology; equivalent to that of a third year Geology major. Selected topics are explored at greater depth using the accumulated geologic knowledge of the participants. The written and oral presentation of a substantial research project forms an essential part of the course. For example, participants have researched the environmental concerns associated with the various geologic options for the permanent storage of high-level nuclear wastes. For more course content information see Earth Sciences section of this calendar.

Instructors: G.K. Muecke
 Prerequisites: ESCI 2201A, 2202B, 3400A, 2101A, 2102B

SCI 3050R Waste Management and the Environment: This is an Experimental Class intended for third year students. It examines the topic of waste management from several perspectives: Resource Economics; Pollution Cycles; Public Health Issues; Technological Controls; International Waste Management Practices; Regulation; and Waste Management Planning. It will include 1 1/2 hours per week of lecturing and 3 hours of lab work. In the lab, the students will learn the practical skills involved in conducting a waste audit and developing a waste reduction and recycling plan on the Dalhousie Campus.

Format: lecture 1 1/2 hours/laboratory, field trips, 3 hours
 Instructors: staff
 Prerequisite: CHEM 1010R OR 1500R or equivalent ESCI 1000R or 1060A/1050B

Fourth-year classes (4000 level)

BIOL 4060A Marine Mammalogy: The class will examine the characteristics that mammals, brought with them when they returned to the ocean, the evolution of the different groups of marine mammals, some of their special adaptations, the roles of marine mammals in oceanic ecosystems and general principles of the marine mammal

population biology. Finally we will consider the factors that regulate marine mammal populations and how these influence attempts to manage and conserve them. Assignments will include dissections of a seal and/or porpoise, a review essay on some marine mammal adaptation, exploring a computer model of a marine mammal population, and an examination.

Format: lectures/discussion/tutorials 3 hours plus some labs
 Instructors: I.A. McLaren (plus others)
 Prerequisites: BIOL 2060 and 3069 or see instructors
 Enrolment: 15

BIOL 4650B Resource Systems and Economic Development: (may not be offered in 1993/94) Major theories of natural resource management have evolved rather separately through economic, behavioural and ecological disciplines. The interphase of ecology with these other disciplines and the criteria which may be used to weigh ecological inputs in economic development planning processes are the major topics to be covered. Current approaches and analytical techniques are described. These illustrate adaptive strategies for long-term resource use, pest and disease control. The course may focus on specialized topics such as fisheries or tropical resource management, as announced in advance. The class includes an introduction to practical problems of project cycles, of defining objectives and of budget analysis. It is open to students from any faculty by permission of the instructor.

Format: lecture/seminar 3 hours
 Instructor: M. Gardner (Inst. for Resource and Environmental Studies)
 Cross-listing: ES 5021B
 Enrolment: TBA

CHEM 4203A/B - Environmental Chemistry: The basic principles of kinetics and chemical equilibria are used to describe the behaviour of metal ions and organic compounds in the aquatic and terrestrial environment. The material covered in this class can be used to better understand the fate of chemicals in the environment and their impact on living organisms. The complexity of the chemical interactions is used to evaluate possible analytical methods for the determination of chemicals in the environment. Topics covered include polyprotic acid base equilibria, distribution of active compounds between gas and solution, Eh - pH diagrams, solubility of oxides, carbonates, and sulphides, complexation equilibria, adsorption onto solids, enzyme kinetics, and the kinetics of distribution of compounds between compartments. A computer programme (Method) is used to derive simple mathematical models suitable for the description of chemical interactions in the

environment. The programming environment is such that the chemistry can be illustrated quickly without writing complex programs in traditional computer languages.
Instructors: Robert D. Guy

OCEA 4120A - Introductory Physical Oceanography: An understanding of the role of ocean physics in climate and pollution abatement is applied. Flushing of Halifax Harbour is studied by field trip and term project. Appreciation of ocean's role in global climate control and methods of measuring the exchange rate of estuaries are emphasized.
Instructors: Ruddick

OCEA 4130A - Introductory Chemical Oceanography: An understanding of the role of ocean chemistry in the global carbon cycle, and the links between ocean chemistry and global climate is emphasized. The use of ocean tracers in inferring ocean circulation processes is demonstrated. Students are taught an understanding of the links between ocean chemistry and global climate and the use of tracers in ocean circulation studies.
Instructors: Moore

OCEA 4170A - Introductory Physical and Chemical Oceanography: Principles applied include oceanic influence on climate and the global cycling of carbon and coastal ocean processes: pollution, nutrient supply mechanisms.

Principles demonstrated include the role of ocean in global climate: physical; carbon cycling; physical controls of nutrient supply in coastal waters; and nutrient chemistry. Emphasized is the overall appreciation of the role of the ocean in global and local environmental issues and methods for computing physical flushing rate of harbours and estuaries - useful in ecosystem and pollution studies.

Instructors: Ruddick, Boudreau
Prerequisites: MATH 1000A or B and MATH 1010A or B (Basic Calculus) or equivalent.

OCEA 4311A/4312B - Fluid Dynamics I and II: Several applications of the physics of fluid flow to environmental contexts: channel flows, waves, convection in the ocean and atmosphere, turbulence. Lecture examples all throughout. Laboratory demonstrations and experiments: effects of density stratification and rotation. Students are taught the mathematical modelling and physical understanding of several oceanic and atmospheric flow and mixing phenomena.
Instructors: Bowen/Kelley
Cross-listings: PHYC 4311A/4312B

OCEA/PHYC 4411A/4412B - Dynamic Meteorology I/II: By understanding how and why the atmosphere flows, the student will

learn the dynamical basis of weather and climate. The interaction of many time and space scales of atmospheric phenomena in determining Earth's climate is an important lesson to be applied to environmental studies. Students will obtain an understanding of how the physical laws of fluid motion determine the atmosphere environment.
Instructors: O. Hertzman
Cross-listings: 4411/4412B

OCEA/PHYC 4530B - Introduction to Radiation and Climate: Introduction to the basic processes responsible for climate; low radiation provides the fundamental forcing for climate; applications include climate change. Knowing how climate works is needed to tackle issues of global change.
Instructors: P. Chylek
Cross-listings: PHYC 4530B

French

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Chair

M. Bishop (494-2425)

Undergraduate Advisors

M. Bishop (494-2425)
J. Brown (494-2430)
T. Gordon (494-2430)

Professor Emeritus

P. Chavy, Agrégé des Lettres (Paris),
Chevalier de la Légion d'Honneur

Professors

M. Bishop, BA, BEd (Manchester), MA
(Maritoba), PhD (Kent, Canterbury)
J.W. Brown, AB (Miami), MA (Middlebury),
PhD (Penn)
B.E. Geaner, BA (Kings), BEd, MA (Dal), Dr.
de 3e cycle (Toulouse, II)
W.T. Gordon, BA, MA, PhD (Tor)
R. Kocourek, State Examination, PhD, CSo
(Charles U., Prague)
H.R. Runte, MA, MPh, PhD (Kansas)
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PhD (Yale)

Associate Professors

B. Bednarski, BA (London), MA (Dal), PhD
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P. De Méo, BA, MA, PhD (UCLA)
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I.Z. Oore, BA (Tel-Aviv), MA (Waterloo), PhD
(Western)
N. Trèves, BSo (American U., Cairo), PhD
(Rice)
K. Waterson, BA (Long Island), MA (NYU),
PhD (CUNY)

Assistant Professor

R.G. Bonnel, Licence (Paris), MA (Essex), Dr.
de 3e cycle (Paris)

Introduction

The Department of French offers students not only the opportunity to develop fluency in classes backed up by excellent laboratory and ancillary facilities, but also the possibility of studying the literature and culture of France, French Canada and the other nations of the French-speaking world, and the linguistic structure and development of French.

Classes are available for beginners and for those with a background in the language who wish to improve and maintain any or all of the following skills: speaking, listening, reading, and writing. Other classes are specially designed for students who are interested in teaching, translation, or other areas of language study. The role of French in Canada and in the Maritimes is stressed in classes in Acadian and Québécois literature and civilization. The literature of France and French-speaking nations is brought to life in classes organized around a theme, a genre, or a historical period.

The Department of French urges students to practise the language as much as possible. The Maisons Françaises are two houses on campus in which students may live with native speakers in a francophone environment. The French Club organizes activities including films, French meals, parties and plays in which all students may participate. Exchanges with Québec and individual student travel and study are encouraged. The Department offers in some years a class off campus in a francophone environment. Please consult the Department for information and see below: Aix-en-Provence.

A BA degree in French with Honours or with Honours in French and another subject combined may lead the student to a career in education, written or oral translation, or may provide the background for careers in many fields, including radio, television, law, social work, public relations, business, diplomacy, journalism and library science. Students considering French as an area of concentration in a BA degree course are invited to discuss the matter at any time (the earlier the better) with a member of the Department. The accent is on the particular needs and aspirations of the individual. An Honours degree is normally required for access to graduate studies: MA, MAT and PhD degrees may be pursued in the Department (see the Calendar for Faculty of Graduate Studies).

Major, Advanced Major or Honours students may, with the approval of the Department of French, take up to one year of work at a University in a francophone environment and receive certain credit at Dalhousie. Scholarships are available for students selected to participate in the Dalhousie/ Aix-en-Provence Year-Abroad Programme, for Honours or Advanced Major students.

The language requirement exemption test in French will be given in the April examination period. Students who would like to write this test should inform the Registrar's Office by mid January. It is to be noted that passing this language requirement exemption test does not give a credit.

Students considering a career in teaching French are encouraged to discuss their goals and programme as early as possible with Professors DeMéo or Myers.

Degree Programmes

BA with Honours in French

This programme offers systematic, comprehensive and individualized study of French language; literature, linguistics and other programme elements both within and without the classroom. It is, therefore, an option which should be considered seriously by any student who, with career or personal objectives in mind, wishes to obtain a strong background in French and by those who plan to teach or earn a graduate degree in French.

Honours students are strongly encouraged to enrich their more traditional learning experience by living in one of the Maisons Françaises and by spending at least one summer in a French-speaking area. Majors or Honours students may, with the approval of the Department, take up to one year of work at a university in a francophone environment and receive certain credit at Dalhousie. Please consult the department for information on programmes available. Please consult the Chair of the Department.

Combined Honours students should consult the Chair before proceeding to see the Honours Advisor. Following is a description of the three different kinds of Honours programmes in French and the requirement for each:

I. Concentrated Honours:

From 9-11 credits in French beyond the first year; "first year" does not necessarily mean FREN 1000-level classes; it refers to any courses taken in the first year of study. The following seven classes are required: FREN 2040R, FREN 2201A or B, FREN 2202A or B, FREN 3020R, FREN 3040R, FREN 3000-level full credit in literature and/or culture; and, normally, two full credits at the FREN 4000-level. An additional grade is required: either an Honours Essay or an Oral Presentation (see document entitled "French Honours Qualifying Examination" obtainable from the Honours Co-ordinator or the Departmental secretary).

II. Combined Honours:

From 11-13 credits in French and another subject; not fewer than 4 nor more than 9 may be chosen in either subject. Minimum requirements for the Combined Honours programme are as follows: FREN 2040R, FREN 2201A/2202B, FREN 3040R plus a minimum of one full credit in language, literature and/or culture at the 3000-level. An additional credit is required: either an Honours Essay or an Oral Presentation (see document entitled "French Honours Qualifying Examination" obtainable from the Honours Co-ordinator or the Departmental secretary).

III. Honours Certificate:

The Honours Certificate is an option for continued study open to anyone who has previously completed a BA major programme in French. Normally, it consists of five full credits of course work plus one additional credit: either an honours essay or an oral interview based on class work and/or a specific topic. Requirements for the honours certificate are similar to those for the concentrated honours programme, but will vary according to individual circumstances.

BA Advanced Major Programme

Students who may not be eligible for the Honours Programme are encouraged to enter the Advanced Major degree programme in French (from 6-9 credits in French beyond the first year, of which at least 3 must be beyond the 2000-level).

The following minimum programme is required: FREN 2040R, FREN 2201A or B, FREN 2202A or B; FREN 3040R; two full credits at the 3000-level; and one full credit at the 4000-level. Notice that students wishing to change to an Honours Programme may do so, if the quality of their work justifies it. Those who might wish to do so should also take FREN 3020R (required for Honours), and consult the Chair or the Honours Advisor.

BA Major Programme

Students should consult the Chair or a Department Advisor about the choice of classes.

The following classes are required: FREN 2040R; FREN 2201A or B; FREN 2202A or B; FREN 3040R and one other full credit at the 3000-level. Normally, three full-credits are taken in the second year (and a minimum of two). Classes other than those required may be chosen freely in consultation with the Major Advisor, according to the students' desire to obtain a general knowledge of the

field, or a greater concentration in specific areas such as Literature, Linguistics, French-Canadian Studies, etc.

Students wishing to change to an Honours Programme may do so during the second or third year of studies, given sufficient standing. Those wishing to do so, or to continue in Graduate Studies after obtaining a BA Major in French, should consult the Chair or the Honours Advisor.

Classes Offered

Classes marked * may not be offered every year. Please consult the current timetable on registration to determine if these classes are offered.

First year classes (FREN 1000R, FREN 1001A, FREN 2000R, FREN 2001B, FREN 1020R, FREN 1040R) may require a regular tutorial session in addition to the three hour weekly class.

FREN 1000R Français pour débutants/Beginners French: This class, intended for students with little or no previous instruction in French, covers a sufficient range of basic linguistic structures and high-frequency vocabulary to enable students to engage in simple, everyday communication on a variety of subjects. Classes are conducted in French as much as possible with a view to developing competence in "real-life" communication, both oral and written. Work done in the three hours of class per week is supplemented with both oral and written exercises in the Dalhousie Learning Laboratory and with reading assignments, compositions, and written exercises to be completed outside of class. Students are also introduced to significant aspects of French, French-Canadian, and other francophone cultures. Upon completion of FREN 1000R, students wishing to complete the study of basic French language structures and to increase their written and spoken fluency should enroll in FREN 2000R. Students who have completed Grade 12 French within the last two years may not register for FREN 1000R. (They should register for FREN 1020R or FREN 1040R.)

Instructor: Staff
Format: Lecture 3 hours, language lab 3 hours
Enrolment: Limited to 30

FREN 1001A/FREN 2001B Français pour débutants: Niveaux I & II/Beginners French: Levels I & II: This class offers students the opportunity to do the work of FREN 1000R and FREN 2000R, normally a two-year programme, in one academic year. FREN 1001A and FREN 2001B each give one full credit. Neither is counted towards a Major in

French, but completion of this work permits entry into the Major or Honours programmes. Students who have completed Grade 12 French within the last two years may not register for FREN 1001A/ FREN 2001B. (They should register for FREN 1020R or FREN 1040R).

Instructors: E. Gesner, T.P. Carter
Format: Lecture 5 hours, language lab 6 hours
Enrolment: Limited to 30

FREN 1020R Révision de français oral et écrit/Spoken and Written French in Review:

This is the usual first-year class for those students who have studied French throughout high school. Designed to develop proficiency in speaking and listening skills, as well as in reading and writing. Classes are taught only in French and involve much oral practice: discussions, exercises, etc. are based on a wide variety of reading and listening materials. Short written exercises and regular compositions reinforce this work. The basic structures of French are reviewed through independent study and classroom practice. Listening comprehension assignments are done in the Learning Laboratory in the Killam Library. It is assumed that students are familiar with the basic structures of French, although it is expected that students have not full control of them. Should a student wish to take both FREN 1020R and FREN 1040R, then only one (1) full credit would be allowed. Students who have completed Grade 12 French within the last 2 years must register for either FREN 1020R or FREN 1040R.

Instructor: Staff
Format: Lecture 3 hours, language lab 1-2 hours
Enrolment: Limited to 30

FREN 1040R Grammaire, vocabulaire et style/ French Grammar, Vocabulary and Style: The class is given entirely in French. Main emphasis will be on structural elements, vocabulary building and correct expression, with consistent parallel attention paid to spelling and pronunciation. The manuals will include a grammar book, and a selection of literary texts to be discussed. A variety of tests and assignments will be used, such as grammar exercises, dictations, translations and compositions.

Instructors: R. Kocourek, D. Lawrence, I. Oora, M. Sandhu, N. Trèves
Format: Lecture/Discussion 3 hours
Prerequisite: Grade 12 French within the last 2 years or equivalent
Enrolment: Limited to 30
Exclusion: FREN 1020R

FREN 1060R Pratique de la lecture/French for Reading: Development of the ability to read contemporary French prose with ease and accuracy. Emphasis is on the acquisition of skills that facilitate reading. Students are encouraged to become familiar with the best French-English dictionaries and to use them judiciously, to learn large blocks of vocabulary by recognizing word families, and to grasp the meaning of unknown words from context wherever possible. Classroom work involves a grammar review, study and discussion of a wide variety of readings as well as correction of prepared translations and sight translations (from French to English only). FREN 1060R is given in English and is not, by itself, suitable for students who plan to major in French. It may, however, be taken by those with no prior training in French or as an additional first-year option for those taking FREN 1020R or FREN 1040R. This course satisfies the Bachelor of Arts Language Requirement.

Instructors: K. Waterson and staff
Format: Lecture 3 hours
Enrolment: Limited to 30

FREN 2000R Français pour débutants: Niveau II/Beginners French: Level II: No student may enrol in FREN 2000R without having first completed FREN 1000R or without the Chair's permission. This class continues the work begun in FREN 1000R, focusing on more advanced forms of expression including the vocabulary, verb forms, and syntactic structures necessary for communication at a relatively high level of abstraction and complexity. As in FREN 1000R, all classes are conducted as much as possible in French, with additional practice provided through the Database Learning Laboratory and through regular reading and writing assignments. Reading selections drawn from the press and the literature of French-speaking cultures continue to be a regular part of the work, in the interest of deepening and enriching the students' understanding of the people whose language they are studying. (Credit awarded for FREN 2000R may not be counted towards a Major in French but the completion of this work permits entry into the Major or Honours programmes.) Students who have completed FREN 1020R and FREN 1040R are not permitted to take FREN 2000R.

Instructor: Staff
Format: Lecture 3 hours, language lab 3-6 hours
Enrolment: Limited to 30

FREN 2001B: See FREN 1001A above.

Note: All classes above this level are given entirely in French.

FREN 2021A or B/FREN 2022A or B Études pratiques/Practice in Language Skills: Follows FREN 1020R or FREN 1040R or FREN 1000R/2000R. It is normally taken in the second year of study and provides the opportunity to practice and improve language skills already acquired. Each year eight sections are chosen from among the twenty options listed below. Each section focuses upon a broad cultural topic via which language skills are developed. No prior knowledge of the topic is supposed. Various readings lead to discussions and oral presentations. Descriptions for sections offered in a specific year may be obtained in April from the Department. All classes and assignments are entirely in French. A maximum of two sections may be taken under the class designation of FREN 2021A or B and FREN 2022A or B.

- Section 01:** Le Journalisme: I. Oore
 - Section 02:** La Société française à travers la littérature: R. Bonnel
 - Section 03:** La Civilisation francophone de l'Afrique occidentale et des Antilles: M. Bishop
 - Section 04:** Etudes acadiennes I: H. Runte
 - Section 05:** Monuments culturels de Paris: R. Kocourek
 - Section 06:** Aspects visuels de la culture française: J. Brown
 - Section 07:** La Guerre des ondes: W.T. Gordon
 - Section 08:** La France et ses photographes: K. Waterson
 - Section 09:** Québécois et Québécoises célèbres: B. Bednarski
 - Section 10:** Aspects du Canada contemporain: E. Gesner
 - Section 11:** Écritures féminines I: N. Trèves
 - Section 12:** L'Art en France depuis la Révolution: M. Bishop
 - Section 13:** Voyages culturels à travers la France: R. Kocourek
 - Section 14:** Etudes acadiennes II: H. Runte
 - Section 15:** Publicités télévisées: J. Brown
 - Section 16:** Aspects de la France contemporaine: E. Gesner
 - Section 17:** Pour comprendre les médias: W.T. Gordon
 - Section 18:** Le Québec à travers les textes: I. Oore
 - Section 19:** Écritures féminines II: N. Trèves
 - Section 20:** TBA
- Instructor:** As above
Format: Lecture 3 hours
Cross-listed: Canadian Studies, in part
Enrolment: Limited to 30

***FREN 2031A or B Interprétation/ Simultaneous Translation:** Practical introduction, given in the language lab, to oral English-French and French-English translating (interpreting) with emphasis on fluency, vocabulary building and comparative syntactico-stylistic analysis.

Instructor: H. Runte.
 Format: Lecture 3 hours in language lab, supplementary lab hours
 Enrolment: Limited to 30

***FREN 2032A or B La phonologie I/Phonology I:** Using widely varied texts and recordings, this class studies the basic sounds (phonemes) of French, and the essential non-phonemic features of the language (rhythm, stress, intonation, etc.) It helps students master French phonemes, understand the role of non-phonemic features in oral communication and use the latter to develop self-expression and audio-comprehension.

Instructor: K. Waterson
 Format: Varied participatory activities, short lectures, language lab
 Prerequisite: FREN 102OR, FREN 104OR or equivalent

Enrolment: Limited to 20
 Exclusion: FREN 2030A or B

***FREN 2033A or B La phonologie II/Phonology II:** This class continues, with an increased emphasis on self-expression and communicative ability, the work of French 2032A or B.

Instructor: K. Waterson
 Format: Varied participatory activities, short lectures, language lab
 Prerequisite: FREN 2032A or B or FREN 2030A or B or instructor's consent

Enrolment: Limited to 20

FREN 204OR Études pratiques de stylistique/ Intermediate Composition: This class constitutes a detailed and comprehensive review of grammar by means of various exercises including dictations, translations, compositions and summaries. It involves a study of written style and manner of expression.

Instructors: R. Kocourek, R. Bonnet, I. Oore, M. Sandhu

Format: Lecture 3 hours
 Enrolment: Limited to 30

***FREN 2050A or B La Structure des dictionnaires français/Structure of French Dictionaries:** This class is an introduction to the use of French and French-English dictionaries. Emphasis is on linguistic problems that are essential for dictionary users in comprehending texts and expressing ideas. Introductions to two first-rate French dictionaries will be studied. A reader of

cultural or literary texts will serve as a source of questions to be raised in exercises, discussions, assignments, and tests.

Instructor: R. Kocourek
 Format: Lecture 3 hours
 Enrolment: Limited to 30

FREN 2201A/FREN 2202B Introduction à la littérature/ Introduction to French Literature: A survey of literature in French from the Middle Ages to the 20th Century, presenting selected works of prose, poetry and theatre from France, Quebec, Acadia and other francophone areas. Introduction to general notions of literary history and to the basic concepts involved in reading literary texts. Attention is paid to the development of both oral and written expression of ideas. FREN 2201A and FREN 2202B may be taken consecutively. Classes involve, principally, group discussion, and lecture.

Instructors: M. Bishop, H. Runte, N. Trèves
 Format: Lecture 3 hours
 Enrolment: Limited to 50

***FREN 2203A or B Approches du texte littéraire/ Approaches to Literary Texts:** An introduction to the critical reading of a selection of literary texts (various genres and periods) with an emphasis on Québec literature. The close analysis of short texts will lead to discussions of the broader nature of recurring images and myths as well as central themes.

Instructor: I. Oore
 Format: Lecture/discussion 3 hours
 Prerequisite: FREN 102OR, FREN 104OR or FREN 200OR

Cross-listed: Canadian Studies
 Enrolment: Limited to 30

FREN 3000A or B Cours supérieur de français oral/ Advanced Oral French Workshop: Class discussions and oral presentations based on themes of contemporary concern. This class may be offered on or off campus in the summer in an intensive fashion. This class is intended to build vocabulary, perfect facility of expression (fluency) and style. Reading and research are necessary for the oral presentations.

Instructor: Staff
 Format: Lecture/discussion 3 hours
 Prerequisite: 2000-level French class
 Enrolment: Limited to 20

FREN 302OR Linguistique/Linguistics: This class will interest future linguists, literary specialists and language teachers, as well as translators and public servants concerned with bilingualism. Its main objective is to improve and refine the students' understanding of the French language and to explain the major areas of its study. Culturally interesting literary excerpts will be used to observe and to analyse linguistic problems in texts. Each student will prepare two reports

on linguistic topics. Assignments based on practical problems of pronunciation, spelling, grammar, vocabulary and meaning will complement the syllabus.

Instructor: R. Kocourek
Format: Lecture 3 hours
Prerequisite: 2000-level French class
Enrolment: Limited to 25

***FREN 3025A or B Les Parlers acadiens: Introduction linguistique/Linguistic Introduction to Acadian Dialectology:** An examination of the phonetic, morphosyntactic and lexical systems of various Acadian speech communities, with emphasis on the Acadian dialects of Nova Scotia. Frequent comparisons will be made between these dialects and both standard French and Québécois. Recorded and written materials are used.

Instructor: E. Geener
Format: Lecture 3 hours
Prerequisite: Corequisite or permission of instructor

Corequisite: FREN 3020R
Cross-listed: Canadian Studies
Enrolment: Limited to 20

FREN 3040R Stylistique/Advanced

Composition: This class develops further the skills acquired in FREN 2040R. Through a variety of exercises, students are taught to express themselves in clear, accurate, idiomatic French, and to perform a number of tasks of a practical nature: writing reports, summaries, letters, etc. A good knowledge of grammar is essential.

Instructors: M. Sandhu and Staff
Format: Lecture 3 hours
Prerequisite: FREN 2040R
Enrolment: Limited to 25

FREN 3081A/FREN 3082B Didactique du français langue seconde à l'école secondaire/Methods of Teaching French at the Secondary Level: Open only to students who have demonstrated adequate competence in French language and culture (passing a French language proficiency exam is required). Students taking this class are normally completing a BEd. Other students interested must consult the instructor. A consideration of foundations of second language teaching moves to a discussion of methodology, techniques, materials (including visual aids), and testing. Emphasis is on developing teaching strategies which enable students to use French as a tool for authentic self-expression, orally and in writing. Directed observation of experienced teachers and practice in the development of teaching skills are integral parts of the class. Evaluation is based upon class participation (microteaching, oral reports, contributions to discussions), written projects, lesson plans, and examinations.

Instructors: P. De Méo, M. Myers
Format: Lecture 3 hours
Corequisite: FREN 3081A
Enrolment: Limited to 25

***FREN 3085B Didactique du français langue seconde à l'école élémentaire et en immersion/ Methods of Teaching French in the Elementary School and Immersion:** This class focuses on specific methods and materials appropriate for the elementary-age child in the French core programme and/or immersion. Students taking this class are normally completing a BEd.

Instructor: M. Myers
Format: Lecture 3 hours

FREN 3100R Civilisation de la France/Civilization of France: An attempt, through talks, reading, discussion and slide presentations, to understand and to suggest fruitful ways of studying, from an English-speaking Canadian point of view, what is essential in French culture and outlook.

Instructors: M. Sandhu, J. Brown
Format: Lecture/discussion 3 hours
Prerequisite: 2000-level French class
Enrolment: Limited to 20

***FREN 3200A or B Appréciation de la littérature/ Literary Appreciation:** An approach to the critical reading of various periods of French literature. The class offers discussion of representative works of major writers, centering either on genre, theme, or period and involving close textual analysis. It also includes some discussion of past and current theories of literature. See department for specific details in any given year.

Instructor: M. Bishop et al
Format: Lecture/discussion 3 hours
Prerequisite: FREN 2201A/FREN 2202B
Enrolment: Limited to 20

***FREN 3250A or B Les femmes écrivains: du temps des cathédrales à celui des Editions des femmes/French Women Writers through the centuries:** A chronological survey based on the study of literary texts by French Women Writers, this class will attempt to analyze the society of the time, the way it portrayed women and their role, and the overall condition of women. Emphasis will be given each time to a special period/authors within the context of the survey. Students taking the class as a Women's Studies class may write their essays and exams in English.

Instructor: N. Trèves
Format: Lecture/discussion 3 hours
Recommended: FREN 2201A/FREN 2202B
Cross-listed: Women's Studies
Enrolment: Limited to 20

***FREN 3300A or B La littérature médiévale/ Medieval French Literature:** Textual analyses of selected works representing the major literary genres (epic, romance, theatre, poetry) from the chansons de geste to François Villon (most texts in modern French translations). The discussion of the origins and the development of a national French literature provide a convenient introduction to critical approaches to literary texts.

Instructor: H. Runte
Format: Lecture/discussion 3 hours
Prerequisite: FREN 2201A/FREN 2202B
Enrolment: Limited to 20

***FREN 3400A or B La littérature du seizième siècle/ 16th-Century French Literature:** Reliving the awakening, bloom and decline of the Renaissance period in literature and language through the works of Marot, Rabelais, Du Bellay, Ronsard, Montaigne and the poets of the baroque. The century's concern with the French language provides a convenient introduction to the study of the development of modern French.

Instructor: N. Trèves
Format: Lecture/discussion 3 hours
Prerequisite: FREN 2201A/FREN 2202B
Enrolment: Limited to 20

***FREN 3500A or B La littérature du dix-septième siècle/17th-Century French Literature:** This class examines representative works by three major seventeenth-century French dramatists: Corneille, Molière and Racine. It explores their vision of humanity and the world and assesses their contribution to French literature and the history of ideas.

Instructor: K. Waterson
Format: Lecture/discussion 3 hours
Prerequisite: FREN 2201A/FREN 2202B
Enrolment: Limited to 20

***FREN 3600A or B La littérature du dix-huitième siècle/18th Century French Literature:** An introduction to the literature of the 18th century which includes works by such authors as Voltaire, Rousseau, Diderot and Marivaux. Each year the readings and class discussions will be centered on a different theme (for example: the hero, women, love, wealth and power).

Instructor: R. Bonnel
Format: Lecture/discussion 3 hours
Prerequisite: FREN 2201A/FREN 2202B
Enrolment: Limited to 20

***FREN 3700A or B La littérature du dix-neuvième siècle/19th Century French Literature:** An introduction to the main literary movements of the 19th century: Romanticism, Realism, Symbolism. Focus is on representative authors and/or texts belonging to one or more of these trends.

Instructor: J. Brown
Format: Lecture/discussion 3 hours

Prerequisite: FREN 2201A/FREN 2202B
Enrolment: Limited to 20

***FREN 3800A or B Théâtre et poésie du vingtième siècle/ French Theatre and Poetry of the 20th Century:** Poetry and Theatre, 1900-1990. Study of modern poetry from Dada and Surrealism to the work of contemporary poets such as Yves Bonnefoy, Jacques Dupin and Michel Deguy; and of modern theatre from Jarry to Beckett, Ionesco and beyond.

Instructor: M. Bishop
Format: Lecture/discussion 3 hours
Prerequisite: FREN 2201A/FREN 2202B
Enrolment: Limited to 20

***FREN 3810A or B Prose et théorie littéraire du 20e siècle/ 20th Century Prose and Literary Theory:** Analysis of a broad selection of short prose by major novelists of the 20th century from Gide, Proust and Aragon but with emphasis upon the more recent work of Beckett, Sarraute, Simon, Duras, Le Clézio and Cixous. Parallel discussion will be centred upon the literary theory of critics such as Bachelard, Poulet, Starobinski, Barthes and Derrida.

Instructor: M. Bishop
Format: Lecture/discussion 3 hours
Prerequisite: FREN 2201A/FREN 2202B
Enrolment: Limited to 20

FREN 3900A/FREN 3901B La littérature canadienne française/French-Canadian Literature: In-depth study of a few major works of French-Canadian literature with emphasis on the period from 1945 to the present day. Each class deals with a specific genre (e.g. FREN 3900A Poetry, FREN 3901B Novel) and choice of genre may differ from year to year.

Instructors: B. Bednarek, I. Oore
Format: Lecture/discussion 3 hours
Prerequisite: FREN 2201A/FREN 2202B
Cross-listed: Canadian Studies
Enrolment: Limited to 20

***FREN 3910A or B Études acadiennes/Acadian Studies:** Critical investigation into the historical, socio-cultural, linguistic and literary significance of past and present Acadian writing. May follow Acadian Studies (FREN 2021A/2022B).

Instructor: H. Runte
Format: Lecture/discussion 3 hours
Prerequisite: FREN 2201A/FREN 2202B
Cross-listed: Canadian Studies
Enrolment: Limited to 20

***FREN 4001A Histoire du français - Moyen Âge/History of French - The Middle Ages:** Advanced research into selected topics in Old and Middle French - manuscript studies;

palography; historical phonetics, morphology and syntax; the cultural-literary context of linguistic development; etc.

Instructor: H. Runte
 Format: Seminar 3 hours
 Prerequisite: 3000-level French class
 Enrolment: Limited to 15

***FREN 4002B Histoire du français - époque moderne/History of French - The Modern Period:** Advanced research into selected topics - the emergence of a national language, the problem of orthography, usage and the development of normative grammars, the evolution of vocabulary, epochal phenomena (Rhétoriciens, the Baroque, Préciosité, the Revolution, scientific French, argot), etc.

Instructor: H. Runte
 Format: Seminar 3 hours
 Prerequisite: 3000-level French class
 Enrolment: Limited to 15

***FREN 4010A or B Grands linguistes du vingtième siècle/Great Linguists of the 20th Century:** How did French-speaking linguists of the 20th century contribute to the understanding of the language? Interpretation of passages by six linguists (such as Saussure, Bally, Tesnière, Guillaume, Gugenheim, Martinet) will show how interesting questions were asked, and how new answers and methods enriched the field of language study. Class reports, discussions, assignments.

Instructor: R. Kocourek
 Format: Seminar 3 hours
 Prerequisite: 3000-level French class
 Enrolment: Limited to 15

***FREN 4011A or B La Lexicologie/Lexicology:** How can French vocabulary be studied and structured? What is its formation (derivation, composition, metaphor, borrowing, abbreviation, etc.), its meaning, its development? Class reports, discussions and lexical assignments are important components of this class.

Instructor: R. Kocourek
 Format: Seminar 3 hours
 Prerequisite: FREN 3020R
 Enrolment: Limited to 15

***FREN 4012A or B Aspects de la structure du français/Aspects of French Structure:** Students will help select, from the many problems of French phonology, graphonomy, grammar, lexical formation and semantics, the ten subjects to be examined in detail. Lectures and readings will be complemented by students' reports. Culturally relevant excerpts from literary masterpieces will be used for discussion and assignments.

Instructor: R. Kocourek
 Format: Seminar 3 hours
 Prerequisite: FREN 3020R
 Enrolment: Limited to 15

***FREN 4016R Cours supérieur de version/Advanced Translation into English:** Development of awareness of the expressive resources of French by dealing with problems and techniques of translation into English. The texts of weekly translation assignments, which account for 50% of the final grade, progress from expository and descriptive prose to poetry. Topics introduced through lectures and oral class reports include categories of translation, style, context and choice, context and meaning, ambiguity, verb systems of French and English, textual redundancy, simultaneous interpretation, and translation of metaphors. Occasionally, alternate English translations of a French text are studied for revealing contrasts.

Instructor: W.T. Gordon
 Format: Seminar 3 hours
 Prerequisite: FREN 3020R
 Enrolment: Limited to 15

***FREN 4041A or B Cours avancé de stylistique littéraire/Advanced Composition:** This class presents an in-depth study of style. The class has as a goal to teach students to express themselves with elegance and refinement.

Instructor: Staff
 Format: Lecture 3 hours
 Prerequisite: FREN 3040R
 Enrolment: Limited to 15

***FREN 4300A or B Le roman courtois/Courtly Novels:** A close literary analysis of mediaeval French Arthurian romances. Texts in bilingual (Old French/French) editions.

Instructor: H. Runte.
 Format: Seminar 3 hours
 Prerequisite: 3000-level French literature class
 Enrolment: Limited to 15

***FREN 4301A or B La Poésie courtoise/Courtly Poetry:** A stylistic and socio-cultural study of French courtly love poetry from the 9th to the 15th centuries. Early texts in modern French translations.

Instructor: H. Runte
 Format: Seminar 3 hours
 Prerequisite: 3000-level French literature class
 Enrolment: Limited to 15

***FREN 4400A or B Poésie de la renaissance: théorie et pratique/Renaissance Poetry: Theory and Practice:** A seminar-style study of poetic theories and practices from the Rhétoriciens to the Pléiade and to Malherbe.

Instructor: N. Trèves
 Format: Seminar 3 hours
 Prerequisite: 3000-level French literature class

Recommended: FREN 3400A or B
 Enrolment: Limited to 15

***FREN 4401A or B La pensée philosophique, politique et morale de la renaissance/Philosophical, Political and Moral Thought of the Renaissance:** An in-depth study of major currents of Renaissance thought: humanism, scientific awakening, the beginning of littérature engagée, and the emergence of the moralistes and philosophes.

Instructor: N. Trèves
Format: Seminar 3 hours
Prerequisite: 3000-level French literature class
Enrolment: Limited to 15

***FREN 4500A or B L'aventure intellectuelle du grand siècle/The Intellectual Adventure of 17th-Century France:** This class examines, at an advanced level, a major writer, movement, genre or theme in 17th-century French literature. As the focus may vary frequently please consult the professor for detailed information on the topic and format.

Instructor: K. Waterson
Format: Seminar 3 hours
Prerequisite: 3000-level French literature class
Enrolment: Limited to 15

***FREN 4600A or B Le siècle des lumières: forme et philosophie/The Enlightenment: Form and Philosophy:** An in-depth study of the French Enlightenment which treats some of the longer works by major authors and introduces the student to secondary authors whose works are also of significant literary, philosophical or historical value. The study is unified by an examination of recurring philosophical ideas and literary themes important to understanding the development of new genres and styles. Please consult the professor for information on the theme treated and the works to be studied in any given semester.

Instructor: R. Bonnel
Format: Seminar 3 hours
Prerequisite: 3000-level French literature class
Enrolment: Limited to 15.

***FREN 4700A La révolution romantique/The Romantic Revolution:** Romanticism is viewed primarily as a rebellious and creative force which greatly contributed to the reshaping of traditional society. The origins, main themes and trends of the movement are studied with an attempt to show Romanticism as a European movement, the impact of which was felt in fields beyond the boundaries of literature. Classes are conducted as seminars; students are required to do a great deal of personal research, to prepare exposés and to participate in class discussions. The choice of texts depends largely on the students' previous experience: they include works by Mme de Staël, Chateaubriand, Lamartine, Hugo, Vigny, G. Sand and others.

Instructor: J. Brown
Format: Seminar 3 hours
Prerequisite: 3000-level French literature class
Enrolment: Limited to 15

***FREN 4701B Le roman du dix-neuvième siècle/The Nineteenth-Century Novel:** intensive study of the work of a major novelist of the 19th century: e.g., Stendhal, Flaubert, Balzac, Zola; a study of his place in the development of the novel and of his contribution to the genre. The class involves a considerable amount of reading, regular reports, and exposés.

Instructor: J. Brown
Format: Seminar 3 hours
Prerequisite: 3000-level French literature class
Enrolment: Limited to 15

***FREN 4710A or B Du symbolisme au surréalisme/From Symbolism to Surrealism:** Analysis of the evolution of French literature from the various symbolist manners of Verlaine, Rimbaud, Mallarmé, Lautréamont and Laforgue, through the period of Jarry and Dada, to the aspirations and paradoxes of Surrealism viewed, principally, through the work of Breton, Eluard, Aragon and Deseos.

Instructor: M. Bishop
Format: Seminar 3 hours
Prerequisite: 3000-level French literature class
Enrolment: Limited to 15

***FREN 4800A Le théâtre moderne de Claudel à Chérid/Modern Theatre from Claudel to Chérid:** In all, eight plays are studied, four from each author. The works offer a contrast in philosophical content and reveal technical problems involved in their stage presentation.

Instructor: M. Bishop
Format: Seminar 3 hours
Prerequisite: 3000-level French literature class
Enrolment: Limited to 15

***FREN 4801B Le Nouveau Roman/Anti-novels of the 20th Century:** In this class we are mainly interested in fictional techniques: how the author creates his illusion. Each of the works selected for detailed study is important due to the author's rejection of conventional ideas regarding the form of the novel.

Instructor: M. Bishop
Format: Seminar 3 hours
Prerequisite: 3000-level French literature class
Enrolment: Limited to 15

***FREN 4811A/FREN 4811B La poésie francophone de Perse et Char à Senghor et Césaire/Francophone Poetry from Perse and Char to Senghor and Césaire:** Discussion of the works of five or six major francophone poets of the modern period, chosen from: Perse, Reverdy, Claudel, Char, Frénaud, Senghor, Tchicaya, Césaire, Gillesant, Miron and others.

Instructor: M. Bleshop
Format: Seminar 3 hours
Prerequisite: 3000-level French literature class
Enrolment: Limited to 15

***FREN 4902A/FREN 4903B Écrivains québécois contemporains/Contemporary Québec Writers:** In depth study of one or more contemporary Québec writers.

Instructors: B. Bednarski/l. Oore
Format: Seminar 2 hours
Prerequisite: 3000-level French literature class
Cross-listed: Canadian Studies
Enrolment: Limited to 15

***FREN 4904A or B Écrivaines québécoises/Québec Women Writers:** This class will explore the condition of women as revealed in texts by Québec women writers. In any given year different writers and time periods will be covered, and a variety of genres may be included.

Instructors: B. Bednarski/l. Oore
Format: Lectures/discussion 2 hours
Recommended: FREN 2201A/2202B and at least one third-year literature class, preferably French Canadian
Cross-listed: WOST 4250A or B; Canadian Studies
Enrolment: Limited to 15

FREN 4994A/FREN 4995B, FREN 4996A/FREN 4997B, FREN 4998A/FREN 4999B: Recherches indépendantes/Independent Research: May only be taken with the approval of the Chair.

Instructor: Staff
Format: Independent study/seminar
Prerequisite: 3000-level French literature class
Enrolment: Limited to 5

German

Location: 1355 LeMarchant St., Halifax,
N.S.
Telephone: (902) 494-2161
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Chair

H.-G. Schwarz (494-2161/2162)

Undergraduate Advisor

H.-G. Schwarz (494-2161/2162)

Professors

F.W. Gaede, PhD (Freib) (McCulloch
Professor in German)
H.-G. Schwarz, MA (Munich), PhD (MoG)

Associate Professor

D. Steffen, PhD (Gott)

Assistant Professor

J.V. Curran, BA (Hons), MA (Dal), PhD (Univ.
of Newcastle upon Tyne)
E.A. Spence, BA (Hons), MA, PhD (UBC)

Introduction

German, the most widely used language in Central Europe, is spoken by approximately 100 million people as their native tongue in Austria, Germany, Switzerland and some parts of Eastern Europe. The cultural, economic, and scientific role of the German-speaking countries makes the knowledge of German indispensable to the study of most academic disciplines.

The departmental programme "German Studies" is the investigation of German culture and its place in the formation of the modern world. The programme concentrates on significant aspects of the cultural tradition of the German-speaking countries. From Luther to Nietzsche, Freud, and Marx, German writers have moved men and nations to change the course of the world. The literary and intellectual development of Germany culminated around 1800 in the epoch of Classicism. The authors of this epoch (Lessing, Herder, Hegel, Goethe, Schiller) founded their writings on a thorough knowledge of the cultural tradition of Europe, especially Greek culture. As scientists, historians, and politicians they described in their literary works, problems and questions of a universal nature. They became the first historians of literature and created the discipline of aesthetics. The universality of the authors of German classicism explains their present day relevance and makes the study of German important and attractive.

Major or honours students may, with the approval of the Department of German, take up to one year (5 full credits) of work at a University in a German-speaking country and receive credit at Dalhousie. The Department has exchange arrangements with the universities of Heidelberg and Munich. In addition there is a "visiting scholars" programme which brings distinguished scholars from Germany to Dalhousie. Visiting scholars for 1993/94 are Professors A. Henkel and S. Hubach from the University of Heidelberg.

Degree Programmes

BA with Honours in German

Students considering an honours course are advised to consult the Department of German.

Combined Honours

It is possible for a student to take an honours degree combining German with another subject. Any student intending to take such a combined honours degree should consult with the two respective departments to arrange the details of such a programme.

Advanced Major

The department is able to offer a major in the 20-credit programme. For further information refer to specific regulations for the 20-credit programme on page 97.

BA

Students concentrating on German should take a minimum of four German classes beyond the 1000 level.

Classes Offered

Note: Classes marked * are not offered every year. Please consult the timetable on registration to determine if this class is offered.

German Language Studies

Introductory Classes Offered

GER 1000R German for Beginners: GER 1000R is a seminar class for beginners only, and no previous knowledge is required. Its equivalent is two years of German in high school with a final mark of 75% or better. The class emphasizes the spoken language, and provides the student with a thorough knowledge of basic grammar. Language laboratory work and attendance of small conversation groups are required as are writing tutorials five or six times during during each term. Passing this class fulfills the first year writing requirement.

Instructors: Staff
Format: Seminar 3 hours
Prerequisite: None
Enrolment: Limited to 20 per section.

GER 1010R German for Beginners: An introductory language class, using the same methods and goals as GER 1000R. This class does not fulfill the writing requirement for beginning students.

Instructors: Staff
Format: Seminar 3 hours
Prerequisite: None
Enrolment: Limited to 20 per section

GER 1050R German Reading Course for Beginners: Students acquire a knowledge of basic vocabulary and grammatical structures sufficient to understand newspapers and texts in the humanities and sciences. No previous knowledge of German is required.

The class is taught in English. Attendance at writing tutorials is required five or six times during each term. For purposes of admission to advanced classes in German it is equivalent to GER 1000R. This class fulfills the writing requirement for first-year students.

Instructor: H.-G. Schwarz
Format: Seminar 3 hours
Prerequisite: None
Enrolment: Limited to 20 per section

GER 1060R German Reading Course for Beginners: An introductory reading class using the same methods and goals as GER 1050R. This class does not fulfill the writing requirement for beginning students.

Instructor: H.-G. Schwarz
Format: Seminar 3 hours
Prerequisite: None
Enrolment: Limited to 20

GER 1000R/1050R or GER 1010R/1060R Intensified German: lecture 6 hours, lab 2 hours. Either of these combinations is recommended for students who desire rapid progress in the German language.

Intermediate Classes

Intermediate classes are based on GER 1000R, GER 1010R, GER 1050R, GER 1060R, high school German Grade 10, 11, 12 or an equivalent basic knowledge. A combination of GER 2000R and GER 2020R serves as an accelerated intermediate German class and is designed for students who want to make rapid progress in the language.

GER 2000R Intermediate German: The main aim is to develop a certain degree of speaking fluency as well as reading and writing skills. Language Laboratory work is required. Small conversation classes once a week as an aid to speaking fluency are compulsory.
Instructors: E. Spence, J. Curran

Format: Seminar 3 hours
Prerequisite: Any of GER 1000R, 1010R, 1050R, 1060R
Enrolment: Limited to 20

***GER 2020R Exercises in Translation and Composition:** English and German texts from various periods of different types will be translated. These translations lead to the discussion of specific difficulties of grammar and construction. Students must prepare translations or compositions for each class.

Instructor: J. Curran
Format: Seminar 2 hours
Prerequisite: GER 1000R, GER 1010R or equivalent
Enrolment: Limited to 20

GER 2050A German Reading I: This is a seminar specifically intended for students who do not fit into our normal programme offerings. Please consult departmental advisor.

GER 2051A or B German Reading II: This is a seminar specifically intended for students who do not fit into our normal programme offerings. Please consult departmental advisor.

GER 3000R Advanced German: Translations, readings, essays and discussions will promote fluency in the language on the advanced level.

Instructor: J. Curran
Format: Seminar 2 hours
Prerequisite: GER 2000R or equivalent
Enrolment: Limited to 20

GER 3010A Advanced Translation I: German-English: German texts of various kinds are used to deal with techniques and problems of translating from German into English. The class includes discussion of such things as translation theories, elements of style and questions of ambiguity and textual redundancy.

Instructor: E. Spence
Format: Seminar 3 hours
Prerequisite: GER 2000R or equivalent
Enrolment: Limited to 20

GER 3011B Advanced Translation II: English - German: English texts of various kinds are used to deal with the techniques and problems of translating from English into German. The class includes discussion of such things as translation theories, elements of style and questions of ambiguity and textual redundancy.

Instructor: E. Spence
Format: Seminar 3 hours
Prerequisite: GER 2000R or equivalent
Enrolment: Limited to 20

Study of German Literature and Culture***GER 2160R Goethe's Faust:**

Instructor: H.-G. Schwarz
 Format: Lecture/discussion 2 hours
 Prerequisite: None
 Enrolment: Limited to 20

GER 2200R Introduction to German

Literature: A study of texts representing major periods of German Literature. Special emphasis is on the interaction between literature, society and other forms of art. The class also serves as an introduction to literary criticism. The language of instruction is English; the texts are in German.

Instructor: E. Spence
 Format: Seminar 2 hours, tutorial 1 hour

Prerequisite: GER 2000R or equivalent or a reading knowledge of German
 Enrolment: Limited to 20

***GER 2300R In Pursuit of Freedom from Luther to Nietzsche:** A study of major modern writers with special emphasis on Hegel's *Philosophy of Right*. This class is taught in English and uses English translations.

Instructor: D. Steffen
 Format: Seminar 2 hours
 Prerequisite: A general introduction to literature, culture or philosophy
 Enrolment: Limited to 20

***GER 2400R German Art and Literature:** This class gives an introduction to modern German Art and Literature. Special emphasis is on the interaction between art and literature, particularly the themes and styles shared by visual and literary expression during the various epochs of modernity.

Instructor: H.-G. Schwarz
 Format: Seminar 2 hours
 Prerequisite: GER 2000R or equivalent
 Enrolment: Limited to 20

***GER 2450R Kant and the History of German Idealism:** A study of Kant's relation to modern Rationalism and Empiricism, and an inquiry into the principles of Idealism.

Instructor: D. Steffen
 Format: Seminar 2 hours
 Prerequisite: GER 2000R or GER 2200R or King's Foundation Year
 Enrolment: Limited to 20

***GER 3050R History and Theory of the German Novel:** Representative works from the Baroque Age to the 20th Century are studied and the principles of the genre discussed.

Instructor: F. Gaede
 Format: Seminar 2 hours
 Prerequisite: GER 2200R or GER 2400R and another literature class
 Enrolment: Limited to 20

***GER 3100R German Literature and Thought from Reformation to Enlightenment:** A study of German literature between the 16th and 18th centuries as a direct reflection of the important religious, social and philosophical developments after the Reformation and during Absolutism.

Instructor: F. Gaede
 Format: Seminar 2 hours
 Prerequisite: GER 2200R or GER 2400R
 Enrolment: Limited to 20

***GER 3150R Goethe and the Enlightenment:** A study of German literature and thought of the time which preceded and witnessed the great revolutions of the 18th century.

Instructor: D. Steffen
 Format: Seminar 2 hours
 Prerequisite: GER 2200R or GER 2400R
 Enrolment: Limited to 20

***GER 3200R Goethe and Romanticism:** A study of Goethe, Hölderlin, Kleist, and Novalis.

Instructor: D. Steffen
 Format: Seminar 2 hours
 Prerequisite: GER 2200R or GER 2400R
 Enrolment: Limited to 20

***GER 3240R Literature of the 19th Century:** A discussion of essential literary texts which throw a critical light on the growing forces of materialism and positivism.

Instructor: F. Gaede
 Format: Seminar 2 hours
 Prerequisite: GER 2200R or GER 2400R
 Enrolment: Limited to 20

***GER 3250R Modern German Literature:** Modern authors as witnesses of the political catastrophes and social changes of our century: a study of the plays of B. Brecht and of selected prose texts of Fr. Kafka, Th. Mann and G. Grass.

Instructor: F. Gaede
 Format: Seminar 2 hours
 Prerequisite: GER 2200R or GER 2400R
 Enrolment: Limited to 20

***GER 4100R Aesthetic Theory:** An historical study of the development of literary theory.

Instructor: F. Gaede
 Format: Seminar 2 hours
 Prerequisite: GER 2200R or GER 2400R and another literature class
 Enrolment: Limited to 20

***GER 4200R Seminar on Hegel's Phenomenology of Spirit:** The *Phenomenology of Spirit*, published in 1807, was Hegel's first major work. He intended to write an introduction to philosophy by demonstrating the necessity of the advance from the most immediate form of knowledge to absolute knowledge. To achieve this he had to write the *Phenomenology* as an introduction to his own philosophy.
 Instructor: D. Steffen

Format: Seminar 2 hours
Prerequisite: GER 2200R or GER 2400R
Enrolment: Limited to 20

***GER 4250R Studies in German Idealism:**
This seminar is specifically intended for students in the advanced major and honours degree programmes. The specific content of the seminar varies from year to year, but is always related to some aspect of Idealism.

***GER 4500A or B Special Topics Course I:**
This is an intensive research seminar dealing with selected topics to be announced.

***GER 4501A or B Special Topics Course II:**
This is an intensive research seminar dealing with selected topics to be announced.

***GER 4600R Special Topics Class:** This is an intensive research seminar dealing with selected topics to be announced.

History

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Chair

J.E. Crowley (494-2011)

Undergraduate Coordinator

S. J. Brooke (494-2011)

Professors Emeritus

J.E. Flint, MA (Cantab), PhD (Lond), FR
HistS, FRSC

P.B. Waite, MA (UBC), PhD (Tor), FRSC

Professors

M.S. Cross, BA, MA, PhD (Tor)

J.E. Crowley, AB (Princ), MA (Mich), PhD
(Johns Hopkins)

J. Fingard, BA (Dal), MPhil, PhD (Lond),
FRSC, Dean, Faculty of Graduate Studies

J.L. Parpart, BA (Brown), MA, PhD (Boston)

N.G.O. Pereira, BA (Williams), MA, PhD (UC
Berkeley)

L.D. Stokes, BA (Tor), MA, PhD (Johns
Hopkins)

G.D. Taylor, BA, PhD (Penn)

M. Turner, BA, MA (Manc), PhD (Lond)

J.B. Webster, MA (UBC), PhD (Lond)

Associate Professors

S.J. Brooke, BA (Dal), MA (McG), DPhil
(Oxon)

G. Hanlon, MA (Tor.), Dr.de 3e cycle
(Bordeaux)

J.T. O'Brien, BA (Wisconsin), MA, PhD
(Rochester)

D.A. Sutherland, BA (MtA), MA (Dal), PhD
(Tor)

D.R. Woolf, BA (Queens), DPhil (Oxon), FR
HistS

Assistant Professors

R. Bleasdale, BA, MA, PhD (Western)

C. Danyk, BA (Concordia), MA, PhD (McG)

C.J. Neville, BA, MA (Carleton), PhD
(Aberdeen)

Introduction

A sense of history is a primitive need felt by individuals and by groups. Just as people need to know who they are and how they arrived where they are, groups, races, classes, states and nations need a sense of their own past as part of their culture.

The academic study of history, therefore, is concerned to discover as much as possible of the reality of the past and to interpret

human behaviour in its changes through time. It is a unique subject, scientific in the way it uses evidence, but still an art because the reconstruction of the past requires a disciplined imagination and an effective rhetoric for the communication of meaning.

The contemporary world is one of intense specialization, in which the varieties of human knowledge have increased well beyond the capacity of any individual to command them all. These developments have reinforced the role of history as the foundation of a person's education, because history can never draw frontiers around itself to exclude any branch of human knowledge, although individual historians will want to select that portion of it especially relevant for them. History's field of study will always be the entirety of the human experience.

The subject of history does not have a monolithic body of knowledge. Historical understanding is a matter of interpretation, of offering explanations for events and movements which are subject to constant revision by scholars. Arguments, scepticism and controversy are thus the very stuff of history. The history student does not merely acquire a particular mass of information, but learns to think independently.

Degree Programmes

A degree in history provides an appropriate background for students planning to enter professional careers in fields such as law, education and journalism, as well as those interested in pursuing graduate study in history or related social science and humanities disciplines.

Classes in the History Department are grouped numerically in several geographical, chronological, subject and other areas: for example, Canadian, American, British, African, Medieval and Early Modern European, Modern European, Women, Science and Technology, etc. Students are strongly encouraged to select a distribution of classes from different areas in order to experience the variety and richness of history.

Students who wish to build up a greater specialization in history than the minimum requirements outlined below may do so by taking classes of an historical nature given by the Departments of Classics, Economics, Music, Philosophy, Political Science, Spanish, Theatre, etc.

Students who wish to concentrate in a particular area of history should consider acquiring the appropriate language skills, especially if they intend to pursue graduate study in it.

General and Honours BA

There are no prerequisites for entry into the programme at the 1000- and 2000-levels; however, some 2000-level classes may exclude first-year freshman students. A first year history course is recommended for prospective majors or honours students but is not mandatory.

Students who wish to major in history in the three-year (15 credits) programme are urged to choose one or two 1000- or 2000-level history classes in their first year. They must take a minimum of four and preferably five, but no more than eight additional credits above the 1000-level, of which at least two must be beyond the 2000-level.

Students who wish to pursue the Advanced Major (four years, 20 credits) programme must complete all the requirements for the three-year degree. In addition, they must take a minimum of two credits (one at the 3000-level and preferably HIST 4500 A or B or HIST 4985A or B, when offered), for a total of at least six but not more than nine credits in history, above the 1000-level.

Students who wish to pursue an Honours Degree in history must also complete all the requirements for the three-year degree. In addition, they must take two required classes (HIST 4990R and, when offered HIST 4985A or B.) and a further number of classes, preferably at the 3000- and 4000-levels, for a total of at least nine but not more than eleven credits above the 1000-level in history. It is also possible to complete a combined Honours Degree in history and another subject, in which case the student should consult the Undergraduate or Honours Coordinators in both Departments.

The following outline presents the minimum departmental requirements for each programme and should be read in conjunction with the general requirements of the Faculty. Students who intend to major or honour in history might wish to consult the department's undergraduate coordinator to have their plan of study approved, preferably before entering the second year.

Please Note: "credits" denotes full credits (i.e. two "A" or "B" classes OR one "R" class)

First Year (all Majors and Honours students)

- Required Classes: none.
- Recommended Classes: at least one credit in history at the 1000 - or 2000 - level.
- Number of Electives: three or four.

Second Year (all Majors and Honours students)

- Required Classes: two or three credits in history from different groups at the 2000 - level.
- Number of Electives: two or three.

Third Year (all Majors and Honours students)

- Required Classes: two credits in history at the 3000 - level.
- Recommended Classes: at least one in history at the 2000 - or 3000 - level.
- Number of Electives: one or two.

Fourth Year (Advanced Majors only)

- Required Classes: two credits in history, one of them at the 3000 - or 4000 - level.
- Number of Electives: two or three.

Fourth Year (Honours Students only)

- Required Classes: HIST 4990R, HIST 4985A or B, (if offered).
- Recommended Classes: HIST 4500A or B (if offered) and three credits in history at the 3000 - or 4000 - level.
- Number of Electives: none.

Types of Classes

There are several different types of classes offered by the History Department. At the 1000- and 2000-level, classes are lecture format, three hours per week, with tutorials featured in some classes. 1000-level classes are intended for students taking a History class as an isolated elective. 2000-level classes begin more specialized study of an area of History as a major or minor.

3000- and 4000-level classes provide opportunities to follow up on interests developed in previous classes. There are two types of classes at the 3000- and 4000-levels: 'lecture/discussion' and 'seminar'. 'Lecture/discussion' classes combine lectures at an advanced level with class discussion. These classes are usually limited to 35 in enrolment. 'Seminar' classes are smaller in size, usually limited to 15, and involve individual presentations by students in class. These classes are particularly recommended for Honours students and prospective Honours students.

Classes Offered

NOTE: Not every class is offered every year. Please consult the current timetable on registration to determine if these classes are offered.

HIST 1001A Medieval Europe: An introduction to the thousand years between the Barbarian invasions of the fourth, fifth and sixth centuries and the beginnings of modern Europe. Original sources in translation are used to illustrate the medieval world

view. Students are acquainted briefly with a wide range of topics, political, cultural and social. Particular attention is paid to developing a basic appreciation of the richness of an age often characterised as "dark" and unknowable.

Instructor: C.J. Neville
Format: Lectures/tutorials 3 hours
Enrolment: Limited to 100
Exclusion: Former HIST 100R students

HIST 1002A or B Renaissance to Revolution, 1500-1789: This course is designed to serve as an introduction to the major themes and events in European history. Students will become acquainted with the importance of regional geography, and with the basic concepts and processes in social, religious, economic, political and cultural history.

Instructor: G. Hanlon
Format: Lectures 3 hours
Enrolment: Limited to 100
Exclusion: Former HIST 100R students

HIST 1003A or B Modern Europe: From the French Revolution to the Cold War, 1789-1956: An introductory survey of the history of Europe from 1789 to 1956. Emphasis will be upon the major political and intellectual developments in France, Germany and Russia, but other national areas as well as social and economic issues will also receive some attention.

Instructors: N.G.O. Pereira
Format: Lectures 3 hours
Enrolment: Limited to 100
Exclusion: Former HIST 100R students

HIST 1050R The Modern World: Open the morning newspaper or tune in the evening news. Crises, conflicts and controversies parade before us in a seemingly random and inexplicable fashion. Where did the problems that confront us today originate? Can an understanding of the past provide guidelines for dealing with the complex issues of the present? Historians cannot foretell the future, but they can provide perspectives that relate the events of our own time to broader trends of political, economic and social development in the modern world. This class seeks to introduce students to history as an on-going process, linking the present to the past.

Instructor: G.D. Taylor
Format: Lectures 3 hours
Enrolment: Limited to 300

HIST 1100R The British Isles from Prehistory to 1688: The British heritage is one very important element in our history. This class, intended as an introduction to British history, with focus not simply on Britain as a nation, but on the growth of a distinctive British culture and civilization over 2000 years. England, Scotland, Wales, and Ireland will each be examined, separately and in

relationship, as will connections between the British Isles and foreign or colonial territories in Europe and ultimately in North America. The first term will trace British history from the Druidic era through the successive invasions of Romans, Anglo-Saxons and Danes, the Norman Conquest and the reintegration of the island in to Europe, and the formation of national languages and cultures in the late Middle Ages. In the second term the focus will be on social, economic, and cultural developments of the period from 1450 to 1688, including colonial expansion, religious reform and dissent, and the growth of representative institutions. Instruction will be by lecture, supplemented by audio-visual presentation, and class discussion where possible.

Format: Lectures 3 hours
Instructors: D.R. Woolf/C.J. Neville
Enrolment: Limited to 100.

HIST 1200R Canada: An Introductory Survey: An overview of the Canadian experience 1200

, from initial contact between natives and newcomers, to contemporary debate over such issues as immigration policy and evolving federalism. Emphasis is placed on the themes of change and conflict in terms of the economy, society and politics.

Instructors: D. Sutherland/C. Danysek
Format: Lectures 3 hours
Cross-listed: Canadian Studies
Enrolment: Limited to 100

HIST 1300R History of the United States: This class surveys the broad contours of the American experience from the Jamestown settlement to the Reagan revolution. It examines the historical development in the United States of republican government, democratic society, and the constitutional conflicts decided by the Civil War. In addition to such political concerns, the class pays particular attention to the economic development of the United States, her unusual racial and ethnic patterns, and her propensity for generating and absorbing reform movements. Students attracted to third and fourth year classes in the history of the United States should consider History 1300 early in their university career.

Instructor: J.T. O'Brien
Format: Lectures 3 hours
Enrolment: Limited to 100

HIST 1400R Europe and the Third World: Passing this class fulfils the first year writing requirement; this class is therefore an introduction to university level work and provides training in study habits, analysis of problems and essay writing by examining six "units of study" in turn. Each unit is concerned with a major phenomenon in the history of European expansion overseas and its impact on non-European peoples, ranging

from 18th century America to twentieth century nationalism and decolonization. For each unit there are lectures and tutorials and students write six essays, one per month in each unit.

Instructors: Staff
Format: Lectures/tutorial 3 hours
Enrolment: Limited to 80

HIST 2001A or B Early Medieval Europe: An investigation of the period between the fourth and the twelfth centuries. Major themes of lectures and tutorials include the mingling and exchange of Roman traditions with the Barbarian cultures in the fifth and sixth centuries, the creation of the feudal states of Europe following the disintegration of the Carolingian Empire, the development of monasticism, church-state relations, the Gregorian Reform and the Investiture Contest, the rise of papal government, the twelfth-century Renaissance, peasant life and popular culture. Original sources in translation are used to familiarise students with the medieval world view.

Instructor: C.J. Neville
Format: Lectures/tutorials 3 hours
Recommended: HIST 1001A or B
Enrolment: Limited to 80

HIST 2002A or B Later Medieval Europe: A study of the period beginning with the pontificate of the greatest of the medieval popes, Innocent III, and ending with the emergence of the early modern European states. After a preliminary introduction to the nature of medieval society at the end of the twelfth century attention is turned to a variety of themes, political, social, cultural, economic and religious. These include the Crusades, church-state relations, heresy, peasant life and peasant rebellions, political thought, varieties of medieval law, architecture and literature, and the concept of decline, or the "autumn" of the Middle Ages. Students make use of original sources in translation.

Instructor: C.J. Neville
Format: Lectures/tutorials 3 hours
Recommended: HIST 1001A or B or HIST 2001A or B or both
Enrolment: Limited to 80

HIST 2006A or B After Columbus: The Old World and the New, 1450-1650. The commercial and colonial expansion of Europe into the Americas. Topics of particular interest are the relations of Europeans and indigenous peoples, the ecological consequences of colonization, the use of unfree labour, the role of technology, the establishment of settler colonies, the effect of overseas communication on European culture, and the role of colonial expansion in the development of the world economy.

Instructor: J.E. Crowley

Format: Lectures/discussion 3 hours
Recommended: HIST 1002A or B
Enrolment: Limited to 80
Exclusions: Former HIST 2010A or B and first-year students

HIST 2007A or B The Atlantic World: European Empires in the Americas, 1650-1800: The development of the European colonial societies after their initial settlement and the establishment of their staple economies in the sixteenth and seventeenth centuries. The topics of chief interest are the predominance of colonial trade in Europe's large-scale commerce, the role of the colonies in European conflicts, the renewal of exploration, the development of the colonies' internal economies, and their revolts against European rule.

Instructor: J.E. Crowley
Format: Lectures/discussion 3 hours
Recommended: HIST 1002A or B, HIST 2008A or B
Enrolment: Limited to 60
Exclusions: Former HIST 2013A or B and first-year students

HIST 2009A or B Enlightenment and Revolutionary Europe, 1715-1815

HIST 2014R State and Society in Early Modern Europe, 1650-1750: This course deepens some of the topics treated in HIST 1002 and examines the development of the modern state in the context of the pre-industrial societies. The states to be studied are the Spanish Empire, the Dutch republic, the Ottoman Empire in Turkey and the Balkans, the French monarchy, the Austrial Empire, and a few smaller states such as Tuscany, Prussia, Sweden, and Poland.

Format: Lectures/tutorial, 3 hours
Instructor: Gregory Hanlon
Prerequisite: None, HIST 1001A or B or HIST 1002A or B recommended
Enrolment: 80
Exclusion: Former HIST 2008R students

HIST 2020R Imperial and Soviet Russia: A survey of Russian history from the time of Peter the Great to the present. Emphasis is on themes of continuity in the process of modernization, as well as upon elements of discontinuity such as the Great Reforms of Alexander II, the Revolutions of 1917, the collectivization of the peasantry under Stalin, etc.

Instructor: N.G.O. Pereira
Format: Lectures/tutorials 3 hours
Recommended: HIST 1001A or B or HIST 1002A or B or HIST 1050R or HIST 1400R
Enrolment: Limited to 90
Exclusion: First-year students (except with permission of instructor)

HIST 2022A or B Nineteenth Century

European Intellectual History: A select survey of the thought and teachings of major figures in European intellectual history from the time of the French Revolution through the First World War, including Schiller, Hegel, Ricardo, Tocqueville, Fourier, Darwin, Marx, Bakunin, Nietzsche, Lenin, and Freud.

Instructor: N.G.O. Pereira

Format: Lectures/tutorials 3 hours

Recommended: HIST 1001A or B or HIST 1002A or B or HIST 1050R or HIST 1400R

Enrolment: Limited to 80

Exclusion: First-year students (except with permission of the instructor)

HIST 2021A or B Soviet Russia: Survey of Soviet Russia from 1917 to the present.

Topics discussed will include the Revolution of 1917, the Civil War and War Commission, NEP, Collectivization, the Great Purges, WWII, and the Post-Stalin era.

Instructor: N.G.O. Pereira

Format: Lectures/tutorial, 3 hrs

Prerequisite: None

Enrolment: Limited to 40

Exclusion: HIST 2020R

HIST 2030R Germany in the Nineteenth and Twentieth Centuries: Selected topics in the history of Germany during the past two centuries, including the growth of nationalism and liberalism, the role of Prussia, industrialization, Bismarck and the political parties, civil-military relations, the rise, rule and destruction of Nazism, and the post-war development of the Federal and German Democratic Republics up to national reunification in 1990.

Instructor: L.D. Stokes

Format: Lectures/tutorial 3 hours

Recommended: HIST 1001A or B, or HIST 1002A or B, or HIST 1003A or B, or HIST 1050R, or HIST 1400R

Enrolment: 30 students per section, up to two sections

Exclusion: First-year students

HIST 2040R Modern France, 1700-1992:

The class covers the last two centuries of political, social, economic and cultural history in Europe's pre-eminent nation. More specifically we examine the transition from a traditional rural society with a precocious state, through the French Revolution and its political and social repercussions.

Throughout the 19th and 20th centuries

France, perhaps more than any other single nation, mirrors developments in all aspects of the contemporary Western world.

Instructor: G. Hanlon

Format: Lectures/tutorial 3 hours

Recommended: HIST 1001A or B, or HIST 1002A or B, or HIST 1003A or B

Enrolment: Limited to 80

HIST 2060R Italy after the Renaissance: Why does the Western world's most advanced economy and culture enter into prolonged decline after 1620? Here we deal with the theme of "decadence" from which Italy has emerged only in the last half of the 20th century. The class explores how advantages became handicaps, how governments tried to stem a decline of which they were acutely aware, of how society reacted to oris, and the roles of ideology in fashioning responses. The class will also focus on those aspects in which there was no decline.

Instructor: G. Hanlon

Format: Lectures 3 hours

Recommended: HIST 1001A or B, or HIST 1002A or B

Enrolment: Limited to 80

HIST 2062A or B Italy from the Risorgimento to Fascism, 1848-1945: Selected topics in the history of nineteenth and twentieth century Italy, including the role of Piedmont in the creation of the national state, regionalism and modernization, the political weaknesses of liberal Italy, and the origins, rule and fall of the Fascist regime.

Instructor: L.D. Stokes

Format: Lectures/tutorial 3 hours

Recommended: HIST 1001A or B, or HIST 1002A or B, or HIST 1003A or B, or HIST 1050R, or HIST 1400R

Enrolment: 30 students per section, up to 2 sections

Exclusion: First-year students

HIST 2081R Twentieth Century Europe in Literature, Art and Film:

A survey of contemporary European history that employs representative works of literature, art, architecture and film as well as traditional published records and monographic accounts to introduce students to major events of the twentieth century: the two world wars, the Russian Revolution, the political systems of Italian Fascism, German Nazism and Soviet Communism, the Holocaust and others.

Instructor: L.D. Stokes

Format: Lectures/tutorial 3 hours (audio-visual facilities as needed)

Recommended: HIST 1001A or B, or HIST 1002A or B, or HIST 1003A or B, or HIST 1050R, or HIST 1400R

Enrolment: 30 students per section, up to two sections

Exclusion: First-year students

HIST 2101A or B Medieval England: This class examines some of the major social, political, economic and cultural themes in English history from the departure of the Roman legions in the fifth century to the Wars of the Roses in the fifteenth. Major topics of study include the development and maturation of the English church, the impact of the Norman Conquest on Anglo-Saxon government and society, the development of the common law system, English monasticism, constitutional struggles in the later medieval period, war with France and Scotland. In an effort to understand and appreciate more fully the culture of medieval England detailed consideration is given to contemporary sources, in translation.

Instructor: C.J. Neville
Format: Lectures/tutorials 3 hours
Recommended: HIST 1001A or B, or HIST 2001A or B, or HIST 2002A or B
Enrolment: Limited to 80

HIST 2104A or B England under the Tudors, 1485-1603: An introduction to the major events, personalities and developments in the political, social and economic history of sixteenth-century England. Issues to be studied include: the formation of a national state; the beginnings of inflation; the Reformation and dissolution of the monasteries; the mid-Tudor "crisis"; and the achievements of the Elizabethan age.

Instructor: D.R. Woolf
Format: Lectures/tutorials 3 hours
Recommended: HIST 1001A or B, or HIST 1002A or B
Enrolment: Limited to 60
Exclusions: HIST 2102A or B, HIST 2103R, and first-year students

HIST 2105A or B England under the Stuarts, 1502-1688: This sequel to HIST 2104A or B studies the principal events of the seventeenth-century English history, with reference to developments in Scotland and Ireland. Among the topics to be discussed: the character of Stuart kingship; the crisis of the aristocracy; the fear of Catholicism at home and abroad; the causes and course of the civil war 1642-49; the importance of Parliament; the Cromwellian Regime; the Restoration; and the Revolution of 1688.

Instructor: D.R. Woolf
Format: Lectures/tutorials 3 hours
Recommended: HIST 1001A or B, or HIST 1002A or B
Enrolment: Limited to 80
Exclusions: HIST 2102A or B, HIST 2103R, and first-year students

HIST 2111A or B Modern Britain to 1884: A survey of the development of British society from the reign of George III to the late Victorian era. This class will examine the

emergence of class society, movements of popular protests, political reform, the growth of empire, and cultural change.

Instructor: S. Brooke
Format: Lectures/tutorials 3 hours
Enrolment: Limited to 60

HIST 2112A or B Modern Britain from 1884 to the Present: This class will examine the development of British society from 1884 to the present day, touching upon the experience of Britain in two world wars, the growth of the welfare state, the decline of Britain's empire and economy, the upheavals of the 1960's and 1970's and the emergence of Thatcher.

Instructor: S. Brooke
Format: Lectures/tutorials 3 hours
Recommended: HIST 2111A or B
Enrolment: Limited to 60

HIST 2151A or B Scotland from the Late Middle Ages to Culloden: A survey of major themes in Scottish history from the fifteenth century to the Jacobean era. After a general introduction to Scotland's geographical and cultural inheritance, students will proceed to a review of such topics as crown-magnate relations in the late Middle Ages, religious life in pre-Reformation Scotland, the coming of the Reformation, the evolution of the Reformed Kirk, Highlanders vs. Lowlanders, the problem of the Borders, the unions of 1603 and 1707, education and poor law in early modern Scotland, the Scottish Revolution, and the Jacobite rebellions. Tutorial discussions will be based on prepared readings. Throughout the class emphasis will be placed on recent re-interpretations of traditionally held views with respect to these so-called "dark ages" in Scottish history.

Instructor: C.J. Neville
Format: Lectures/tutorials 3 hours
Enrolment: Limited to 60

HIST 2152A or B Scotland since 1745: A survey of major themes in the history of "North Britain" from the last Jacobite rebellion of 1745 to the present. Topics to be dealt with include the Scottish Enlightenment, the Age of Improvement, radicalism and repression, the Clearances and emigration to North America, agitation for parliamentary reform, Scottish Chartism, Walter Scott and Scottish Romanticism, Scottish cities in the Victorian era, Scottish socialism, Scotland in the Depression, the Second World War, the ascendancy of Labour, Scottish nationalism, North Sea oil, and the legacy of underdevelopment.

Instructor: D.A. Sutherland
Format: Lectures/tutorials, 3 hours
Enrolment: Limited to 60

HIST 2202A or B Canada's Industrial Revolutions, 1850-1950: A study of Canada's transition from a pre-industrial

society to a leading industrial nation. Principal themes for discussion include urbanization, the rise of the factory and mass production, the impact on home and family, the revolution in transportation and communications, weapons development, and patterns of consumption. Special attention is given to the role of technology.

Instructor: R. Bleasdale

Format: Lectures/tutorials 3 hours

Recommended: HIST 1200R or equivalent

Introductory class in Canadian history

Enrolment: Limited to 60

Cross-listed: Canadian Studies

HIST 2211A or B Social History of Canada before 1870: This class examines the social history of pre-Confederation Canada through such topics as social control, violence and protest, women and domestic life, regionalism and marginal peoples, and the transformation of the economy.

Instructor: C. Danyak

Format: Lecture/tutorial 2 hours (evening)

Enrolment: Limited to 60

Cross-listed: Canadian Studies

Exclusion: Former HIST 2210R students

HIST 2212A or B Social History of Canada Since 1870: This class examines the social history of Canada since Confederation through such topics as the impact of industrialization, social classes, conflict, the role of women, the state and social development, and relationships among the wide variety of social groups in Canada.

Instructor: C. Danyak

Format: Lecture/tutorial 2 hours (evening)

Enrolment: Limited to 60

Cross-listed: Canadian Studies

Exclusion: Former HIST 2210R students

HIST 2221A or B Rough Justice: Order, Disorder and Canadian Popular Culture to the 1890s: This class investigates the character of popular culture, the diversions, recreations and forms of community control engaged in by Canadians, and the attempts by authorities and the law to bring order to the culture. Topics range widely over the broad scope of popular culture, from sports, drinking and prostitution to religious organisation. Study of the mechanisms and institutions for imposing order includes the criminal law, industrial discipline, and more respectable forms of cultural activity.

Instructors: R. Bleasdale/M. Cross

Format: Lectures/tutorials 3 hours

Enrolment: Limited to 60

Cross-listed: Canadian Studies

Exclusions: Former HIST 3241A or B, HIST 3242A or B, HIST 3280A or B, HIST 3281A or B students

HIST 2222B Rough Justice: Order, Disorder and Canadian Popular Culture, 1890s to the Present: This class continues the study of Canadian popular culture described in HIST2221A or B, from the turn of the century to the present.

Instructors: R. Bleasdale/M. Cross

Format: Lectures/tutorials 3 hours

Enrolment: Limited to 60

Cross-listed: Canadian Studies

Exclusions: Former HIST 3241A or B, HIST 3242A or B, HIST 3280A or B, HIST 3281A or B

HIST 2230R Canada in the Twentieth Century: A survey of the roots of contemporary Canada, which studies the origins of our current issues and problems by focusing on Canadian political developments, as well as on economic and social structures, French-English relations and provincial and regional disparities.

Instructors: R. Bleasdale/C. Danyak

Format: Lectures/tutorials 3 hours

Enrolment: Limited to 60

Cross-listed: Canadian Studies

Recommended: HIST 1200R or an equivalent Introductory class in Canadian history

HIST 2270R The Atlantic Provinces: survey of Maritime and Newfoundland history from the beginnings of European penetration to the "triumph of Canadianization." Attention is given to the interaction of environment and culture which has given rise to a durable but nevertheless vulnerable regional character. The class seeks to define internal patterns of social change and social conflict while simultaneously placing regional development within a broader national and international context.

Instructors: J. Fingard/D. Sutherland

Recommended: HIST 1200R or an equivalent introductory class in Canadian history

Cross-listed: Canadian Studies

Enrolment: Limited to 60

HIST 2331A or B Colonial British North America, 1600-1760: Early American history from the British invasion of North America through the establishment of settler colonies to the imperial crisis.

Instructor: J. Crowley

Format: Lectures 3 hours

Recommended: HIST 1300R

Enrolment: Limited to 60

HIST 2332A or B Nineteenth Century America: In 1800 slightly more than 5 million persons lived in the United States, farmed for

a living, and owned land, but by 1900 a majority of the country's 76 million inhabitants neither owned nor farmed their own lands. Clearly much changed in nineteenth century America: the nation's western boundary shifted from the Mississippi to the Pacific; cities and factories altered her landscape; her slave system, the world's largest, was destroyed in the first great industrial war of our time; and by 1900 she was the most powerful industrial producer on the globe. The nature and consequences of these and other major developments are the subjects considered in this class.

Instructor: J.T. O'Brien
Format: Lectures/tutorials 3 hours
Recommended: HIST 130OR
Enrolment: Limited to 20
Exclusion: Former HIST 233OR and first year students.

HIST 2333A or B Twentieth Century America: This class traces the political and economic history of the United States from the turn of the century to the Reagan era. Particular emphasis is placed on broad trends of change in those years: the growth of large private and public bureaucracies and their impact on traditional values; the continuing influence of racial and ethnic divisions on American politics; the role of the media on political organizations and practices; and the growing interconnections of foreign policy, military commitments and economic resources in the years since the Second World War.

Instructor: G.D. Taylor
Format: Lectures/discussion 3 hours
Recommended: HIST 130OR or a similar survey class in U.S. history
Enrolment: Limited to 60
Exclusion: Former HIST 233OR students

HIST 2334A or B The United States, Canada and the World: As neighbours, interlinked by geography, economic patterns and (to some extent) common political and cultural traditions, Canada and the United States have had a close though not always smooth relationship over the past two hundred years. But that relationship has often been shaped by broader changes in international political, military and economic affairs, and - particularly in the twentieth century - U.S. foreign policies that affect Canada are determined by events and concerns far removed from North American shores. This class traces the history of Canadian-American relations in the context of these broader trends in United States foreign policy, and global political and economic developments.

Instructor: G.D. Taylor
Format: Lectures/discussion 3 hours
Recommended: A survey class in U.S. or Canadian History

Enrolment: Limited to 60
Cross-listed: Canadian Studies
Exclusions: Former HIST 333OR, HIST 3331A or B, and HIST 3331A or B students

HIST 2335A or B Modern American Culture: American mass culture has become familiar to billions throughout the world in this century. One would be hard pressed to discover in Germany, Japan, Brazil or Canada, college students unfamiliar Elvis, Hollywood, adolescence, IQ, McDonald's, the Blues, Superbowl, or the Pill. In this class the concern is with the historical development of these cultural phenomena rather than with their export to the rest of the world. Lectures and readings focus on such matters as changing moral standards for young Americans, fashion and gender roles, food and film. Recordings and movies supplement the lectures.

Instructor: J.T. O'Brien
Format: Lectures/tutorials 3 hours
Recommended: HIST 130OR
Enrolment: Limited to 60
Exclusion: First-year students

HIST 2370A or B Age of Imperialism 1870-1970: Deals with the last hundred years of the activities of the imperial powers, their impact on the world, their rivalries among themselves and the resistance they provoked on every continent. Different forms of conquest are discussed and illustrated, the shifting power balance among the imperial powers is traced, and the growth of national resistance movements and their ideologies investigated. The class gives particular emphasis to the United States as the most important imperial power of the period, to its role in Latin America and to the ideologies which inform resistance movements.

Instructor: M. Turner
Format: Lectures/discussion 3 hours
Enrolment: Limited to 60

HIST 2381A or B Latin America: Underdevelopment and Revolution: Outlines key developments in Latin America from the independence wars to the present - the growth of nationalism, the impact of British and American capital and the development of the anti-imperialist struggle - in relation to Argentina, Brazil, Chile, Peru, Central America and Cuba.

Instructor: M. Turner
Format: Lectures/discussion 3 hours
Enrolment: Limited to 60
Exclusion: Former HIST 2380A or B, and HIST 2382A or B students

HIST 2410A or B Tropical Africa Before 1900: A study of some of the major themes of African pre-colonial history through an examination of the interim politics and development of African states and societies

In tropical Africa. It will focus on the impact of immigration, slavery and Islamic penetration on African society.

Instructor: J. Webster
 Format: Lecture/tutorial 3 hours
 Enrolment: Limited to 80
 Recommended: HIST 1400R

HIST 2421A or B Colonial Africa: Examines the history of Africa from the period of European colonial rule (1884) to the emergence of independent African states in the 1960s. The class will analyze the material base of colonial society; culture, class and social change during the colonial period; issues around changing gender roles; and the nationalist struggle and decolonization.

Instructor: J.L. Parpart
 Format: Lectures/tutorials 3 hours
 Recommended: HIST 1400R
 Enrolment: Limited to 80

HIST 2422A or B Independent Africa: A study of Africa from the early 1960s to the present. The class will examine neo-colonial myths and realities, class, party and state in Africa, economic development and underdevelopment, and the quest for national stability during the current crisis. The class will look at the impact of structural adjustment on women's and men's lives and the current struggles in Southern Africa.

Instructor: J.L. Parpart
 Format: Lectures/tutorials 3 hours
 Recommended: HIST 1400R
 Enrolment: Limited to 80

HIST 2501A or B The Middle East to the First World War: Begins with the historical geography and the linguistic and cultural divisions of the region. Examines the emergence of Islam, its basic doctrines, and the Islamic view of politics and history. With this background concentration is then on the nineteenth century, looking at the impact of European influences, the problem of "reform" in the Turkish and Iranian empires, the British occupation of Egypt, revolutions of the early twentieth century, the origins of Zionism and the impact of the First World War.

Instructor: J.E. Flint
 Format: Lectures/discussion 3 hours
 Prerequisite: Completion of first year university
 Recommended: HIST 1400R
 Enrolment: Limited to 80
 Exclusion: First-year students

HIST 2502A or B The Middle East since the First World War: Begins with the impact of British and French imperial designs after 1918, the Balfour Declaration on Palestine, the creation of new Arab states and the Republic of Turkey. This leads to an examination of secular reform versus Islamic traditionalism, Arab nationalism, rise of the

oil industry and the impact of the Second World War, the emergence of the state of Israel, the revolutions in Egypt and Iraq, the rise of OPEC, the fall of the monarchy in Iran and the nature of Khomeini's Islamic Revolution.

Instructor: J.E. Flint
 Format: Lectures/discussion 3 hours
 Prerequisite: HIST 2501A or B
 Enrolment: Limited to 80
 Exclusion: First-year students

HIST 2800R History of India: This class will examine the period from the late 18th century and the beginnings of British rule to the present day. The principal themes include: religion and social structure over two centuries of profound political and economic change; the modernization of the Indian economy; the rise of nationalism and national political organizations; and India's place in the world affairs.

Instructor: Staff
 Format: Lectures/discussion 3 hours
 Recommended: HIST 1400R
 Enrolment: Limited to 80
 Exclusion: HIST 2801A or B

HIST 2995A or B History of Modern Medicine, 1800-1950: This class examines the state of medicine in 1800, 1850, 1900 and 1950, and the transition of American and Canadian medicine from a low status, ineffective, poorly trained group of competing sects to what it is today. For each of the four periods the emphasis is on medical training, the diagnostic and therapeutic capabilities of physicians, their views on disease etiology, their attempts to control the size and quality of the profession and to prohibit the entry of women, and the scientific background to their views.

Instructor: J. Ferley
 Format: Lectures/discussion 3 hours
 Enrolment: Limited to 80
 Exclusion: Former HIST 2295A or B students

Cross-listed: BIOL 3404A

PLEASE NOTE: Students are advised to check the format of the 3000-level classes, whether 'lecture/discussion' or 'seminar'. Seminars are marked with an asterisk (*).

HIST 3001A or B Medieval Civilization: Each year one or more particular topics are chosen, broad enough to be used as central themes in the context of which medieval civilization may be closely examined; for instance, monasticism, universities, peasants and popular culture. Such topics are studied in some depth, where possible using original sources in translation, and recent periodical literature and/or monographs. Students master the basic work in certain areas, but are also encouraged to develop particular topics more thoroughly. Class discussions

are used to unravel contentious or difficult aspects. Students are expected to contribute to such discussions and to write one or two well argued and documented papers. Some prior knowledge of medieval European history is essential.

Instructor: C.J. Neville
Format: Lectures/discussion, 2 hours
Prerequisite: HIST 2001A or HIST 2002B or HIST 2101A
Recommended: HIST 1001A
Enrolment: Limited to 35
Exclusions: Former HIST 3000R and HIST 3002B students

HIST 3002A or B The Medieval Church: This class does not attempt to provide a chronological survey of the development of the Western church, but is an advanced seminar dealing with topics which have no strict chronological limits. Subjects of study include monasticism, heresy, education and the universities, town and cathedral, lay-clerical conflict, and "popular" concepts of religion. Each year one or more topics are examined in detail, with the help of original documents in translation, and using recent periodical literature and/or monographs. Students prepare and present one or two well-researched papers, and class discussions are used to explore related materials and readings in greater depth. Some prior knowledge of medieval European history is essential.

Instructor: C.J. Neville
Format: Lectures/discussion, 2 hours
Prerequisites: HIST 2001A or HIST 2002B or HIST 2101A
Recommended: HIST 1001A
Enrolment: Limited to 35
Exclusions: Former HIST 3021A and 3022B students

***HIST 3003A or B England in the Later Middle Ages:** Beginning around the reign of Edward I (1272-1307), attention is given to political, institutional, religious and social aspects of English history prior to the Tudors. This period includes the deposition of two reigning monarchs, the Scottish Wars of independence, the Hundred Years' War, the Black Death, Wycliffite heresy and the Lollards, and the so-called "Wars of the Roses". It is therefore of exceptional interest and variety. Each year one or more topics of study are chosen for detailed consideration, where possible making use of original sources (in translation), and with the help of recent periodical literature. Class discussions are used to explore particularly difficult or controversial questions, and all students write one or two well argued and documented papers. Some knowledge of English medieval history is essential.

Instructor: C.J. Neville
Format: Seminar 2 hours

Prerequisite: HIST 2101A
Recommended: HIST 1001A or HIST 2001A or HIST 2002B
Enrolment: Limited to 15
Exclusions: Former HIST 3009A, HIST 3007B and HIST 3010R students

***HIST 3004A or B Crime and Society in Post-Conquest England:** This class explores the development of the criminal law in England between 1066 and 1600. After some introductory lectures by the instructor on the legacy of Anglo-Saxon legal notions and the creation of the royal system of justice known as the "eyre", attention is given to a study of the development of a more sophisticated hierarchy of courts: the local tribunals presided over by justices of the peace and sheriffs, itinerant sessions headed by the justices of assize, and the central court of King's Bench. The origins and elaboration of particular offenses, including treason, felony (murder, rape, arson, burglary and larceny) and trespass are examined. Emphasis is placed on the social aspects of crime in medieval England, and extensive use is made of recent periodical literature dealing with crime and its effect in this period.

Instructor: C.J. Neville
Format: Seminar 2 hours
Prerequisite: HIST 2101A or B, or HIST 2001A or B, or HIST 2002A or B

Recommended: HIST 1010A or B, HIST 2104A or B
Enrolment: Limited to 15
Exclusions: Former HIST 3009A or B, HIST 3007A or B, and HIST 3010R students

***HIST 3005A or B The Early Modern Mind: European Thought and Culture, 1450-1700:** The purpose of this class is to provide students who have an interest and some background in early modern European history with more advanced study of the major issues and themes in European cultural history from the advent of printing to the dawn of the Enlightenment. Students will discuss writings by seminal authors such as Bacon, Montaigne, Bayle and Descartes, in addition to secondary works. The emphasis throughout will be not only on "high culture" but also on its relationship to society as a whole and to popular customs and rituals. Topics to be discussed include the impact of print, utopian thought, the witch craze, urbanization and civic consciousness, the writing of history, aspects of the scientific revolution, and the growth of religious toleration and scepticism.

Instructor: D.R. Woolf
Format: Seminar 2 hours

Prerequisite: One 2000- or 3000-level class in medieval or early modern European history, or instructor's consent

Recommended: HIST 2005A or B, HIST 2006A or B, HIST 2008A or B

Enrolment: Limited to 20

Exclusion: Former HIST 3011A or B students

***HIST 3006 A or B Renaissance and Reformation Europe, 1349-1559:** A survey of the major themes, subjects, and personalities in western European history from the Italian Renaissance to the beginnings of the Protestant Reformation in the sixteenth century. Topics to be covered include the rise of Italian city-states, Italian humanism, the arts, the emergence of centralized monarchies in northern Europe, religious sentiment, and the reform movement. Although most areas of western Europe will be dealt with, the focus will be on Italy, France, and Germany.

Instructor: D.R. Woolf

Format: Lectures/discussion, 2 hours

Prerequisite: Any first- or second-year European history class

Exclusion: Former HIST 2005R students

Enrolment: Limited to 40

HIST 3040R Culture and Behaviour in Early Modern France, 1550-1750: This class explores the characteristics and complexities of elite and popular culture between the wars of religion and the Enlightenment. Emphasis is placed on the traditional universe of Early Modern civilization and the process it underwent in a variety of domains: religion, education, sociability, deviance, social organization, etc.

Instructor: G. Hanlon

Format: Lectures/discussion, 2 hours

Prerequisite: Any European Medieval or Early Modern history or literature

Enrolment: Limited to 35

***HIST 3051R Fascist and National Socialist Movements in Europe, 1900-1945:** The origins, ideologies, social composition, leadership, rise to power and rule of the two principal fascist and national socialist movements, those of Mussolini's Italy and Hitler's Germany, as well as similar phenomena in other European countries between the world wars, are studied comparatively to distinguish them from Soviet communism and other varieties of authoritarianism and totalitarianism.

Instructor: L.D. Stokes

Format: Seminar/lecture/discussion 2 hours

Prerequisite: One 2000-level class in European or modern British history

Recommended: HIST 2030R, HIST 2062A or B, HIST 2081R, HIST 2020R, HIST 2022A or B, HIST 2040R

Enrolment: Limited to 20

Exclusion: Former HIST 3051A or B

***HIST 3052R Europe and World War Two:** Selected topics on the origins, course and aftermath of the Second World War as this involved Europe, including Nazi foreign and occupation policies, strategic and political decision-making by the Allied and Axis powers, national resistance movements, and the wartime origins of the Cold War.

Instructor: L.D. Stokes

Format: Seminar/lecture/discussion 2 hours

Prerequisite: One 2000-level class in European or modern British history

Recommended: HIST 2030R, HIST 2062A or B, HIST 2081R, HIST 2020R, HIST 2040R

Enrolment: Limited to 20

Exclusion: Former HIST 2052A or B, or HIST 3052A or B students

***HIST 3055R The Holocaust: The Destruction of the Jews of Europe, 1933-1945:** The destruction of most of European Jewry by Nazism and its helpers during the Second World War is studied in the context of centuries-old religious anti-Semitism, nineteenth century Jewish emancipation and the emergence of racist ideology, the political and social situation of Jews in eastern and western Europe after World War I, "legal" and bureaucratic persecution of German Jews culminating in mass killing at Auschwitz and other death camps, the response of bystander nations to the perpetration of genocide, and finally the creation of the state of Israel in relation to the Holocaust.

Instructor: L.D. Stokes

Format: Seminar 2 hours

Prerequisite: One 2000-level class in European or modern British history

Recommended: HIST 2030R, HIST 2062A or B, HIST 2501A or B, HIST 2502A or B, HIST 2020R, HIST 2040R

Enrolment: Limited to 20

Exclusion: Former HIST 1990R (section 07) students

HIST 3072A or B The Rise of Modern Science: The modern world has been fundamentally altered by science and technology. In what ways? How has this come to be? This class, designed for students in the Arts as well as in the Sciences, examines these questions by looking at the origins of modern science in the sixteenth and seventeenth centuries, its

growing popularity in the eighteenth century, and the rise of the scientific profession and science-based industry in the nineteenth and twentieth centuries.

Instructors: J. Farley (Biology)/R. Ravindra (Comparative Religion)

Format: Lectures/tutorials 3 hours

Enrolment: Limited to 35

Cross-listings: BIOL 3402A or B, PHYS 3402A or B, CREL 3502A or B

***HIST 3090A or B Russian Society:** Some basic institutions of Russian society are considered in their historical context, with special attention to the role of the Party and Marxism-Leninism, official culture and literature, the workings of the economy, and social stratification.

Instructor: N.G.O. Pereira

Format: Seminar 2 hours

Prerequisite: Reading knowledge of Russian (at least two years of language study) and some Russian history

Recommended: RUSS 1000R, RUSS 2000R

Enrolment: Limited to 20

***HIST 3092A or B Russian Topics:** Topics to be studied and researched will vary from year to year. They may include the sources of Bolshevism/Leninism, the doctrine of peaceful coexistence, the position of national minorities, the role of literature (official and samizdat) and the press, the Cult of Personality, Khrushchev's "Thaw", Glasnost and Perestroika.

Instructor: N.G.O. Pereira

Format: Seminar 2 hours

Prerequisite: One 2000-level class in history

Recommended: HIST 2020R, HIST 2022A or B, HIST 2030R, HIST 2040R, HIST 2062A or B

Enrolment: Limited to 18

HIST 3053A or B The Gorbachev Revolution in Historical Perspective: This class will examine the Gorbachev years (1985-1991) against the background of historical precedents as well as discontinuities.

Specifically, the concepts and practices of glasnost, perestroika, and democratization will be compared and contrasted with policies under Lenin, Stalin, Khrushchev, and Brezhnev.

Instructor: N.G.O. Pereira

Format: Lecture, 3 hours

Recommended: Preference given to students with some previous Russian history

Enrolment: 35

***HIST 3105A or B The English Civil War: Society, Religion and Politics, 1603-1660:** An advanced class on one of the most tumultuous and eventful periods in British history, that leading up to and including civil war and revolution 1642 to 1660. Select

primary sources will be used in addition to secondary works. Topics to be studied include the social structure of early Stuart England; the Church and its critics; foreign policy; radical politics; the military course of the war; religious sectarianism; and the impact of the war and its aftermath on the populace.

Instructor: D.R. Woolf

Format: Seminar 2 hours

Prerequisite: Any second year class in British history

Enrolment: Limited to 20

Exclusion: The former History 3104R

Recommended: HIST 2105A or B, HIST 2106A or B, HIST 2005A or B, HIST 2008A or B

***HIST 3106A or B England in the Age of Industrial Revolution:** This class examines in some depth major themes in English history from the reign of George III through the Victorian era, including the British response to revolutions in America and France, the Napoleonic wars, the movement for Parliamentary reform, and the growth of industrialization.

Instructor: Staff

Format: Seminar 2 hours

Prerequisite: One 2000-level class in English history

Recommended: HIST 2111A or B, HIST 2112A or B, HIST 2131A or B, HIST 2132A or B

Enrolment: Limited to 20

HIST 3112A or B England, 1867-1914: This class concentrates upon the late Victorian and Edwardian Period in British History, from 1867 to the outbreak of the first World War. It will touch upon such subjects as urbanization, class politics, and culture, the transformation of the monarchy, the problem of poverty, women's emancipation, and the Irish Question.

Instructor: S. Brooke

Format: Lectures/discussion, 2 hours

Prerequisite: One 2000-level class in English history.

Recommended: HIST 2111A or B, HIST 2112A or B, HIST 2131A or B, HIST 2132A or B, HIST 3106A or B

Enrolment: Limited to 35

HIST 3113A Britain in the Age of the First World War, 1914-39: This class examines in depth major themes in modern British history from the first World War to the outbreak of the second, including the experience and impact of war, the problem of Ireland, the rise of labour, women's struggles, the great depression and the appeasement of the dictators in the 1930s.

Instructor: S. Brooke

Format: Lectures/discussion, 2 hours

Prerequisite: A 2000-level class or instructor's permission
Recommended: HIST 2111A or B, HIST 2112A or B, HIST 2131A or B, HIST 2132A or B, HIST 3106A or B, HIST 3112A or B
Enrolment: Limited to 35

HIST 3114B Britain from the Second World War to Thatcher, 1939-1990: This class examines in depth major themes in British history from the outbreak of the Second World War to the emergence of the 'Thatcher Phenomenon', including the war experience, the post-war labour governments and the welfare state, the affluence of the 1950s and 1960s, Suez, the immigrant experience, and social and economic decline in the 1970s, ending with the election of Margaret Thatcher in 1979.

Instructor: S. Brooke
Format: Lectures/discussion, 2 hours
Prerequisite: A second year history course or instructor's permission

Recommended: HIST 2111A or B, HIST 2112A or B, HIST 2131A or B, HIST 2132A or B, HIST 3106A or B, HIST 3112A or B, HIST 3113A or B

Enrolment: Limited to 35

***HIST 3115A Socialism and Working-Class Politics in Britain, 1880's-1980's:** The last century in Britain has witnessed two intertwined developments: the full participation of the working-class in politics and the rise to power of a socialist party, the Labour party. This class will cover three aspects of that history: the development of working-class culture and politics (in particular through the union movement); the shaping of socialist ideology in Britain; and the emergence and development of the Labour party. It will embrace social, economic, and intellectual history, covering such topics as the "New Unionism" of the 1880's, working-class culture in Britain; the General Strike; the Labour governments of 1945-51, and, throughout, the arguments over ideology.

Instructor: S.J. Brooke
Format: Seminar 2 hours
Prerequisite: One 2000-level class in English history

Enrolment: Limited to 15
Recommended: HIST 2111A or B, or HIST 2112A or B

HIST 3116 A or B Advanced Seminar in British History: Culture, Class, and Society in Twentieth-century Britain: How does culture reflect social and political change? This class sets out to explore this question in the context of modern British society. Using a variety of texts, such as films like *My Beautiful Launderette*, the photographs of Bill

Brandt and Humphrey Spender, the plays of John Osborne, Howard Brenton, and Caryl Churchill, art, architecture, and popular forms of culture, this seminar will examine how issues such as class tension, social change, the decline of empire and the beginning of a multi-racial society, changes in women's status, and other political and social developments represented in twentieth-century Britain, from the First World War to the present day.

Format: Seminar, 2 hours
Instructor: S.J. Brooke
Prerequisite: Instructor's consent
Enrolment: limited to 15

HIST 3220A or B Youth Culture in Canada, 1950's to 1970's: The 1950's and 1960's were decades of often startling social change throughout North America in general and Canada in particular. This class will attempt to understand these changes and their impact on our society. The primary focus of the investigation is the popular youth culture of the time, the culture of "sex, drugs and rock n' roll." The class will look at economic and social factors underlying youth culture, at some of the major thinkers who influenced it (such as Marshall McLuhan and Herbert Marcuse), and the responses of authority to youth culture.

Format: lecture/tutorial 3 hours
Instructor: M.S. Cross
Prerequisite: One previous history class
Recommended: HIST 2220R
Cross-listed: Canadian Studies
Enrolment: Limited to 60

HIST 3222A or B Topics in Canadian Social History, 19th and 20th Centuries: This seminar will explore major themes in Canadian social development. The topics discussed will vary from year to year but will emphasize such themes as: changing values in Canadian society; the nature of popular cultures; the relationship of order and disorder; the family; gender relations; and social classes.

Instructor: M. Cross
Format: Seminar 2 hours
Prerequisite: A class in Canadian History
Enrolment: Limited to 15
Cross-listing: Canadian Studies

HIST 3225A or B Crime, Punishment and the Criminal Law in Canadian Society: This class examines crime and the criminal law as they relate to broader changes within society and the economy of New France, British North America, and Canada. Moving from the nineteenth century through to the 1980's, it analyses the shifting patterns of crime; the changing definitions of crime and punishment; the social, economic, political,

and ideological significance of the original law; and the influence of Britain, the United States, and France on legal developments.

Instructor: R. Bleasdale
Format: Seminar or lecture/discussion
 2 hours

Prerequisite: One previous history class
Recommended: HIST 2221A or B, and HIST 2222A or B

Cross-listed: Canadian Studies
Enrolment: Limited to 25

HIST 3230A or B Labour and Community in Nineteenth-Century Canada: The experience of Canadian workers during the transition to an industrial capitalist society. Topics include pre-industrial work patterns, new forms of discipline and the employment relationship, varieties of collective protest and organization, and changes in the structure of the family and community.

Instructor: R. Bleasdale
Format: Seminar or lecture/discussion,
 2 hours

Prerequisite: One previous history class
Cross-listed: Canadian Studies
Enrolment: Limited to 25

HIST 3231A or B The Canadian Working Class: The Twentieth Century Experience: The development of the Canadian working-class movement from 1896 to the present. Topics include the degradation of work, the question of international unions, labour in politics, women and trade unions, the role of the state in industrial relations, and working-class culture in mass society.

Instructor: R. Bleasdale
Format: Seminar or lecture/discussion,
 2 hours

Prerequisite: One previous history class
Cross-listed: Canadian Studies
Enrolment: Limited to 25

HIST 3245A or B French Canada: Given in English for English-speaking students, this class traces the development of French-Canadian society through the study of political and social developments. While the emphasis is on developments in Quebec, French-Canadians in the Maritimes, Ontario and the West will also be studied.

Instructor: M. Cross
Format: Lectures/discussion, 2 hours
Prerequisite: One class in history

Enrolment: limited to 35
Cross-listed: Canadian Studies
Exclusion: Former HIST 2240A or B students

HIST 3255A or B The Age of MacDonald and Laurier: A seminar comprehending the society and politics of Canada from Confederation to the First World War. Themes of particular importance are imperialism, nationalism, and racism; the clash of nationalism; the opening of new frontiers; politics and ideology.

Instructor: Staff
Format: Lectures/discussion, 2 hours
Prerequisite: A survey of Canadian history
Cross-listed: Canadian Studies
Enrolment: limited to 35

***HIST 3260A or B History of the Canadian West:** This seminar takes a thematic approach within a chronological framework, exploring social, economic and political topics in the development of Western Canada.

Among the themes considered are Native economies, political dissent, labour radicalism, ethnic relations, and federal-provincial relations.

Instructor: C. Danyek
Format: Seminar or lecture/discussion
 2 hours

Prerequisite: One class in history
Enrolment: Limited to 15

Cross-listed: Canadian Studies
Exclusion: Former HIST 2250A or B students

HIST 3261A or B The Rural Experience in Canada: The rural experience has dominated Canada's past and continues to exert a strong influence in the present. This class explores the contours of Canadian rural life, examining the impact of rural politics, economics, social relations and ideologies upon Canadian development. Specific themes will vary from year to year to reflect student interests.

Instructor: C. Danyek
Format: Seminar

Prerequisite: A survey of Canadian history
Enrolment: Limited to 15
Cross-listing: Canadian Studies

***HIST 3272A or B Themes in the History of Atlantic Canada:** This class provides students an opportunity to broaden their knowledge of historical trends in the region through archival research based on specific selected themes, which vary from year to year.

Instructor: Staff
Format: Seminar, 2 hours
Prerequisite: One class in Canadian history
Cross-listed: Canadian Studies
Enrolment: Limited to 15

***HIST 3273A or B Nova Scotia: Pre-Confederation:** An exploration of character and circumstances in the history of provincial society, from the era of European "invasion" to the debate over entry into British American union.

Instructor: D. Sutherland/J. Fingard
Format: Seminar 2 hours
Prerequisite: One Canadian History class or instructor's consent

Enrolment: Limited to 25
Cross-listed: Canadian Studies
Exclusion: Former HIST 3270R

***HIST 3274A or B Nova Scotia:**

Post-Confederation: An exploration of the transformation of provincial society in response to the onset of Canadianization and industrialization.

Instructors: D. Sutherland/J. Fingard
Format: Seminar 2 hours
Prerequisite: One Canadian History class or instructor's consent

Recommended: HIST 3273A

Enrolment: Limited to 25

Cross-listed: Canadian Studies

Exclusion: Former HIST 3270R

***HIST 3286A or B The Urban Experience in**

Canada: The rise of the city stands as one of the most crucial changes to have taken place in our collective past. This class explores the reasons for and the impact of urbanization within Canada. Emphasis is on developments from the mid nineteenth century to the present.

Instructor: D. Sutherland
Format: Seminar 2 hours/week
Prerequisite: One class in history
Cross-listed: Canadian Studies
Enrolment: Limited to 25

HIST 3292A or B Wealth and Power in North

America: Business enterprises have played a major role in shaping the social and political as well as economic development of the United States and Canada over the past two hundred years - perhaps more so than in most other modern nations. This class explores the growth and significance of business in the history of these two countries. Among the topics covered are: entrepreneurship, technical innovation and economic growth; the rise of big business and management organization; the convoluted and controversial linkages of business and government; and the emergence of multinational enterprises and their impact on Canadian-American relations.

Instructor: G.D. Taylor
Format: Lectures/discussion 2 hours
Prerequisite: One class in Canadian or U.S. history, or an appropriate class in a related discipline.

Recommended: A survey class in U.S. or Canadian history

Enrolment: Limited to 35

Cross-listed: Canadian Studies

Exclusion: Former HIST 3291A or B, and HIST 3291A or B

HIST 3302A or B Technology and History in

North America: The effects of technology on our lives are ever-present, from debates over acid rain and nuclear reactors to promises of a glowing future for Canada through "high-tech" enterprises and supercomputers. The continuing impact of technical innovation has been a central feature of the history of Canada and the United States, going back

even to the period before the Industrial Revolution of the nineteenth century. The harnessing of science and technology to industrial and military uses in our own time has fuelled both rapid economic growth and controversies over the benefits and costs of technological changes for the household, the workplace, the environment, politics and society in North America.

Instructor: G.D. Taylor
Format: Lectures/discussion, 2 hours
Prerequisite: One class in Canadian or U.S. history, or an appropriate class in a related discipline.

Recommended: A survey class in U.S. or Canadian history

Cross-listed: Canadian Studies

Enrolment: Limited to 35

HIST 3341A or B Revolutionary America, 1760-1820: Topics of particular interest are the popularization of politics, the social conflicts related to neutralism and Loyalism, the development of a national political economy and constitutional tradition, and the cultural changes associated with republican government and egalitarian ideology.

Instructor: J.E. Crowley
Format: Lectures/discussion, 2 hours
Prerequisite: One 2000-level class in U.S. history, or HIST 2131A or B

Enrolment: Limited to 35

HIST 3350A or B Family and Community in North America, 1600-1900: The family in North American society, from when the family was a model for social relations to the time when it was idealized as a private refuge. Among the topics considered are the role of the family in rural and urban communities, the demographic transition from high fertility and mortality, the reduction of the family's economic and educational autonomy, the role of ideology in shaping sex roles and childbearing; and the relations of family and community according to ethnic group, class and economic setting.

Instructor: J.E. Crowley
Format: Lectures/discussion, 2 hours
Prerequisite: One second-year class in American or Canadian history

Recommended: A class in the sociology or social anthropology of the family

Cross-listed: Women's Studies 3300A or B
Enrolment: Limited to 35

***HIST 3360A or B Enslavement and Emancipation: Afro-Americans in the U.S. South to 1900:** This class examines slavery as a system of racial subordination and economic exploitation. Attention is given to the social, familial, and cultural life of the slaves, the role of slavery in shaping southern nationalism and national racial beliefs, and to reconstruction after the Civil War.

Instructor: J.T. O'Brien
Format: Seminar 2 hours
Prerequisite: HIST 1300R or second-year U.S. history class
Recommended: HIST 2332A or B
Enrolment: Limited to 25

***HIST 3361A or B The American Civil War and Reconstruction:** The Civil War, occasioned by the formation of the Southern Confederacy and the Union government's refusal to recognize the existence of a separate southern nation, was a pivotal moment in the history of the United States. This class will examine the causes of the war, the forces behind slave emancipation, the military fortunes of the two combatants, and the efforts undertaken by the victorious society, to alter the polity of the defeated South.

Instructor: J.T. O'Brien
Format: Seminar 2 hours
Prerequisite: HIST 1300R or second-year U.S. history class
Recommended: HIST 2332A or B
Enrolment: Limited to 25

***HIST 3366A or B Industry, Unionism, and Workmen in the United States, 1873-1940:** America's rise to industrial pre-eminence shot forward after the Civil War. By 1900 she had the most productive industrial economy in the world, as well as one of the world's bloodiest labour histories. The growth of unions, however, proceeded much more slowly. Indeed, unionization of mass production industries was not achieved until late in the 1930s with the spread of the CIO and the revitalization of the AFL. This class examines the fitful history of American unions from the beginning of the depression of the 1870s to the end of the Great Depression of the 1930s.

Instructor: J.T. O'Brien
Format: Seminar 2 hours
Prerequisite: HIST 1300R or one second-year U.S. history class
Recommended: HIST 2332A or B, HIST 2333A or B, HIST 2334A or B
Enrolment: Limited to 25

HIST 3368A or B From Roosevelt to Reagan: The United States since 1929: This class examines in depth some of the major features of American political and economic history in the period since the Great Depression. Some of the major themes covered are: the rise and fall of the New Deal coalition; the impact of the media on politics; the emergence of the "Imperial Presidency" and conflicts with Congress; the "military-industrial complex" and the growth of the Sunbelt; and controversies over the relationship between government and business in the context of global economic competition.
Instructor: G.D. Taylor

Format: Lectures/discussion, 2 hours
Prerequisite: HIST 1300R or an equivalent introductory class in U.S. History
Recommended: Any 2000-level class in U.S. history
Enrolment: Limited to 35

***HIST 3370A or B Marxism in the Third World:** Revolutionary movements in the twentieth century characteristically use Marxist ideology. This class outlines characteristically used Marxist thought and investigates its uses by revolutionary movements and societies outside Europe. Case studies will be drawn from Latin America, Asia and Africa.

Instructor: M. Turner
Format: Seminar 2 hours
Prerequisite: One previous class in history
Enrolment: Limited to 25

***HIST 3380A or B Chattel Slaves and Wage Slaves:** Plantation production in the last three hundred years has depended on various forms of labour, slave, contract and wage, sometimes working in conjunction. This class will investigate the interaction of economic and technical change on the workers' legal status and on the forms of labour protest and methods of control used throughout the history of plantations. Studies will focus on the Caribbean and comparisons will be made with adjacent areas of the Americas.

Instructor: M. Turner
Format: Seminar 2 hours
Prerequisite: One second-year Arts class
Enrolment: Limited to 20

***HIST 3390A or B The Caribbean: Underdevelopment and Revolution:** Caribbean wealth and Caribbean revolutions have made the islands a focus of imperial rivalries for more than three centuries. This class deals with the impact of twentieth century imperialism and the emergence of nationalism and socialism. Particular attention is paid to Cuba.

Instructor: M. Turner
Format: Seminar 2 hours
Prerequisite: One second-year Arts class
Enrolment: Limited to 25

HIST 3440A or B African History from Oral Tradition: For students who have a keen interest in African history, the class concentrates upon a restricted geographic area and considers myths of origin, allegory and symbolism in oral traditions, how political leaders become national deities through ancestor worship and how feminist movements of the past have been handled by male chroniclers.

Instructor: Staff
Format: Seminar, 2 hours

Prerequisite: Any 2000-level class on African history

Recommended: HIST 2410A or B

Enrolment: Limited to 20

HIST 3451A or B South Africa to 1880:

Examines the history of South Africa before the coming of the mineral revolution.

Themes include the nature of Khoi and San societies, the expansion of Bantu-speakers, Dutch settlement and administration of the Cape area, the rise of the Zulu, Shaka's empire and the *mfecane*, the British takeover from the Dutch, the impact of the humanitarian movement and the Great Trek, African states and kingdoms in the nineteenth century and the formation of the Boer Republics.

Instructor: J. Parpart

Format: Lectures/discussion, 2 hours

Prerequisite: HIST 2131A or B, HIST 2132A or B, HIST 2421A or B, HIST 2422A or B or permission of instructor.

Enrolment: Limited to 35

Exclusion: Former HIST 3450R students

HIST 3452A or B South Africa since 1880:

The class examines not only the changes in race relations and politics, but also the effects of mining and other industries on rural and urban societies after the discoveries of diamonds and gold. Themes will include British policies and the "imperial factor", the growth of Afrikaner and African nationalism, the Boer War and unification, the development of apartheid and South Africa's relations with the wider world.

Instructor: J. Parpart

Format: Lectures/discussion, 2 hours

Prerequisite: HIST 2421A or B, HIST 2422A or B, HIST 3451A or B, HIST 3461A or B, HIST 3462A or B

Recommended: HIST 3451A or B, HIST 2131A or B, HIST 2132A or B

Enrolment: Limited to 35

Exclusion: Former HIST 3450R students

***HIST 3461A or B Women and Development**

In Africa: This class examines the economic, political and social roles of African women from precolonial to modern times. It analyzes women not as objects, but as actors who participate in the political and economic processes which affect their lives. The class will examine development and feminist theory in the light of recent debates over women and development issues.

Instructor: J.L. Parpart

Format: Seminar 2 hours

Prerequisite: A core class in either International Development Studies or Women's Studies

or a class on Africa in the History Department or permission of the instructor.

Cross-listed: Women's Studies 3310A or B

Enrolment: Limited to 15

***HIST 3462A or B Distortion or Development: African History:** An examination of economic change in tropical Africa, with particular attention to the question of economic development and underdevelopment. From the premercantile period to the current crisis.

Instructor: J. Parpart

Format: Seminar 2 hours

Prerequisite: HIST 2422A or B

Enrolment: Limited to 15

***HIST 3610A or B Women in Capitalist Society: the North American Experience:** An examination of the impact of industrialization and urbanization on "woman's sphere" in society and of the emergence of various strains of feminism in the nineteenth and twentieth centuries.

Instructor: Judith Fingard

Format: Seminar 2 hours

Prerequisite: One class in Canadian or American history or in Women's Studies.

Cross-listed: Women's Studies 3305A or B, Canadian Studies

Enrolment: Limited to 25

***HIST 3612A or B Women in Socialist Countries:** Investigates the progress made towards the achievement of equal status for women in societies dedicated in principle to equality for all. Case studies will range from Cuba to China.

Instructor: M. Turner

Format: Seminar, 3 hours

Prerequisite: One second-year Arts class

Cross-listed: Women's Studies 3330A or B

Enrolment: Limited to 20

HIST 3750A or B History of Seafaring: An examination of our maritime heritage with the cooperation of the staff of the Maritime Museum of the Atlantic. Within the context of these overlapping periods - the age of discovery, the age of sail, and the age of steam - the focus is on the development of merchant and naval fleets; the roles of the state, capital, and labour; and the features of seafaring culture. Special emphasis is given to the shipping industries and maritime traditions of this region.

Instructor: J. Fingard

Format: Lectures/discussion, 2 hours

Prerequisite: One class in history or permission of the instructor

Cross-listed: Canadian Studies

Enrolment: Limited to 35

HIST 4001 A or B Directed Readings:

Format: Individual instruction
Enrolment: As required

***HIST 4500A or B Topics in Modern History:**

This seminar is specifically intended for students in the Advanced Major and Honours degree programmes in History. The specific content of the seminar varies from year to year, but generally involves examination of a subject in history in some depth, and may include an historiographical, comparative or interdisciplinary dimension.

Instructor: Staff
Format: Seminar 2 hours
Prerequisites: Completion of all requirements for the 15-credit B.A. degree in History.

Enrolment: Limited to 20

***HIST 4985A or B The Varieties of History:**

Historiography in the Twentieth Century: This class, intended for Honours and Advanced Major students in History, will begin with a brief survey of the writing of history from the Middle Ages to the nineteenth century, and then proceed to an examination of the major schools, approaches, and sub-disciplines within the historical profession in the twentieth century. Topics to be covered include the following: the nature of historical knowledge, historical "relativism", Marxism, the "Annales" school, oral history, psychohistory, quantitative history, Feminism and others. No background in statistics is required. Classes will meet weekly to discuss assigned readings and each student will investigate an historian or historical school of his/her choice for a term paper.

Instructor: D.R. Woolf
Format: Seminar 2 hours
Prerequisites: Concurrent enrolment in HIST 4990R or instructor's consent

Recommended: A class in modern intellectual history or PHIL 2540R

Enrolment: Limited to 15

HIST 4990R Honours Essay in History: All history Honours students and those in combined Honours programmes in which history is their principal subject must write a substantial essay on a topic to be chosen in consultation with the undergraduate coordinator and an individual faculty supervisor.

Instructor: Staff
Format: Honours Essay
Prerequisites: Completion of all requirements for the 15-credit major in History, admission into the Honours Programme.

Humanistic Studies in Science

Attention is drawn to the following classes, offered in several departments. All of these classes are concerned with the humanistic aspects of scientific thought and its development.

Classes marked * are not offered every year. Please consult the timetable on registration to determine if these classes are offered.

History of the Sciences

***Biology 3402A/Physics 3402A/History 3072A, Comparative Religion 3502A, The Rise of Modern Science:** J. Farley (Biology and History), R. Ravindra (Physics, Comparative Religion)

***Biology 3403A or B A History of Biology:** J. Farley

***History 2295A or B The History of Modern Medicine:** J. Farley

***History 3075A or B History of Tropical Medicine:** J. Farley

Biology 4864B/Oceanography 5331B, History of Oceanography: E.L. Mills

Psychology 4580 History of Psychology: J.W. Clark

Philosophy of the Sciences

***Philosophy 2410A Philosophy of Psychology:** T. Tomkow

***Philosophy 2420B Philosophy of Biology:** R. Campbell

Biology 3410B Men in Nature: K.E. von Moltzahn

***Comparative Religion 3531 Mystical Consciousness and Modern Science:** R. Ravindra

***Comparative Religion 3503A or B Nuclear Bombs Survival and Morality:** R. Ravindra

Health Professions, Interdisciplinary

The following classes are offered as electives for students in the Faculty of Health Professions. For details on elective requirements refer to the calendar entry for the appropriate school or college. These classes may not be offered every year; Consult the current timetable.

HLTH 3000B An Interdisciplinary Approach to Health Promotion: 3 credit hours. Intra- and interdisciplinary trends in the conceptualization, empirical investigation and practical implementation of health promotion will be examined. Students will consider historical, present and future perspectives of specific health promotion issues. Learners will have opportunities to develop skills in analyzing factors influencing the delivery of health promotion within the Canadian health care system. The contribution of different health professions to the study of health promotion will be assessed and the effectiveness of a teamwork approach will be evaluated.

Format: 3 lecture hours/week
Prerequisite: None
Enrolment: Consult department

HLTH 3001B Drug Issues: An Interdisciplinary Perspective: Drug use issues of interest to health professionals will be explored. Topics covered will assist students in considering methods of identifying and preventing or diagnosing and treating drug-related problems and will include information on promoting appropriate drug use attitudes and behaviours. Students will have the opportunity to study these topics from an interdisciplinary perspective.

Format: 2 lecture hours/week, 1 tutorial hour/week
Prerequisite: None
Enrolment: Consult department

HLTH 4900A An Interdisciplinary Approach to Gerontology (Social Perspectives): 3 credit hours. This is a multidisciplinary class in Gerontology with a focus on the presentation of historical and current research studies in the field of social gerontology, primarily from a Canadian perspective. This class represents the wide range of study which is reflected in most of the sciences and humanities.

Format: 3 lecture hours/week
Prerequisite: SOSA 1000R, SOSA 1050R; SOSA 1100R; or SOSA 1200R
Cross-listing: SOSA 2060, OCCT 4417A, PHSE 4498A, HEED 4498A, PHAR 4980A, PHYT 4300A, LEIS 4498A
Enrolment: limited to 80

HLTH 4910B An Interdisciplinary Approach to Gerontology (Health Perspectives): This multidisciplinary class in Gerontology focuses on the presentation of health issues and relevant research studies in the field of aging. Various health professionals working with this age group participate to emphasize the interdisciplinary nature of gerontology.

Format: 3 lecture hours/week
Cross-listing: PHYT 4301B, PHSE 4499B, HEED 4499B, PHAR 4970B, OCCT 4418B, LEIS 4499B

Prerequisite: HLTH 4900A
Enrolment: limited to 80

International Development Studies

Location: Multidisciplinary Centre, 1444 Seymour Street, Halifax, N.S.
Telephone: (902) 494-3814
Fax: (902) 494-2178

Coordinator

Dr. J.H. Barkow (494-6747/3814)

Undergraduate Advisor

Dr. J.H. Barkow (494-6593)

Emeritus Professors

K.A. Heard, (Political Science)
 P. Rudeman, (Health Administration)

Faculty

J.H. Barkow (Sociology and Social Anthropology)
 M.E. Binkley (Sociology and Social Anthropology)
 M. Bishop (French)
 R. Clarke (Resource and Environmental Studies)
 J.E. Holloway (Spanish)
 P.B. Huber (Economics)
 J.M. Kirk (Spanish)
 B. Lesser (Economics)
 T.J. Li (Sociology and Social Anthropology)
 R.J. McAllister (Economics)
 L. McIntyre (Health Services Administration)
 A. O'Malley, Adjunct (Sociology, SMU)
 J.L. Pappart (History and Women's Studies)
 R. Ravindra (Comparative Religion)
 T.M. Shaw (Political Science)
 A.M. Sinclair (Economics)
 C.T. Sinclair-Faulkner (Comparative Religion)
 K. Sullivan (Education)
 A.D. Tillett (Lester Pearson Institute)
 M. Turner (History)
 H. Velmeyer, Adjunct (Sociology, SMU)
 M. Welton (Education)

Introduction

"The right to development must be fulfilled so as equitably to meet developmental and environmental needs of present and future generations." (extract from Agenda 21 of the UN Conference on Environment and Development in Rio de Janeiro, June 1992).

Dalhousie University and Saint Mary's University are coordinating resources to offer an undergraduate degree in international development studies. This reflects a commitment by both universities to the concept of sustainable development, not only

for those privileged to live in Canada and other wealthy nations - but also for those in the Third World.

To foster greater understanding through study, teaching, research and shared field experiences of North-South partnerships and development, distinctive BA major and honours degree programmes enable students to work within interdisciplinary frameworks on both university campuses, as well as to draw upon the international development experiences from over twenty overseas linkage programmes currently engaged in by Dalhousie and Saint Mary's Universities.

Normally students are eligible to join the IDS programme at the start of their second year of university studies, once appropriate classes in at least two of the major participating social science/humanities' disciplines have been completed.

Students with a background in science are also welcomed in this programme and every effort will be made to design study frameworks to explore how science can contribute to sustainable development and to encourage their interest in science within an international context.

All IDS students are encouraged to acquire competence in basic statistics and research design, e.g. Political Science 2249R, as well as in one relevant language in addition to English, e.g. French, Spanish, Russian, through appropriate classes and supporting activities.

Students are encouraged to enter the combined honours or advanced major programmes, which provide opportunity further to integrate their IDS studies with those of an approved arts or science field e.g. IDS and History, IDS and Biology. Students should bear these two options in mind, particularly if they plan to pursue graduate studies.

For a full listing of Saint Mary's University faculty and classes in IDS, please consult the current Saint Mary's University academic calendar. IDS core and other classes are usually available each summer through the "Halifax Summer School in International Development". Halifax is the Maritime regional centre for official and non-governmental organizations active in international development and the IDS programme encourages links with them, especially in terms of development education, international exchanges and data resources. In addition to the Dalhousie and Saint Mary's Universities library collections (general, law, environmental, medical and science libraries) and computer facilities, resource and reading materials on international development can be found in the following units:

Dalhousie University

International Institutes for Transport and
Ocean Studies

International Student Centre

Lester Pearson Institute for International
Development

School of Resource and Environmental
Studies

Saint Mary's University

Asian Studies Programme

Gorebrook Research Institute

International Education Centre

Centre for Latin American and Caribbean
Development

Mount Saint Vincent University Library**The Halifax and Dartmouth Public Libraries****Degree Programmes**

The regulations for the major (regular and advanced) or honours BA degree in International Development Studies require:

- (1) Completion of the equivalent of one full credit of first year classes in at least two of the major participating social science or humanities disciplines (that is, Comparative Religion, CREL 1000R, CREL 2000R; Economics, ECON 1100R, History, HIST 1050R, HIST 1400R; Political Science, POL 1100R, POL 1103R, POL 1501R; Sociology and Social Anthropology, SOSA 1000R, SOSA 1050R, SOSA 1100R; or Spanish, SPAN 1100A or B, SPAN 1110A or B).
- (2) For the honours degree, the equivalent of (i.e. two half year classes equals one full credit) at least nine and no more than eleven full credit classes from the following approved list, of which:
 - a) three must be IDS 2000R, IDS 3000R and IDS 4010R (including an honours essay);
 - b) a minimum of the equivalent of two full credit classes above the 1000 level in each of two established disciplines within International Development Studies for a total of four full credits;
 - c) a minimum of the equivalent of five full credit classes must be at the 3000 level or above;
 - d) class selection must be approved by the programme coordinator.
- (3) For the (20 credit) advanced major, the equivalent of (i.e. two half-year classes equal to one full credit) at least six and no more than nine full credit classes from the following approved list, of which:

- a) three must be IDS 2000R, IDS 3000R and IDS 4010R (the last without the honours essay requirement);
- b) a minimum of the equivalent of two full credit classes in each of two established disciplines within International Development Studies for a total of four full credits;
- c) a minimum of the equivalent of three full credit classes must be at the 3000 level or above;
- d) a minimum of the equivalent of one full credit from each of the three groups: Humanities, Social Sciences, and Life and Physical Sciences (listed at the beginning of the calendar);
- e) a language class from among those listed in the Regulations at the beginning of the calendar, normally French or Spanish.

- (4) For the (15-credit) major, the equivalent of at least four and no more than eight full-credit classes from the following approved list, of which:

- a) two must be IDS 2000R and IDS 3000R;
- b) a minimum of the equivalent of (i.e. two half year classes equal to one full credit) two full credit classes above the 1000 level in each of two established disciplines within International Development Studies;
- c) a minimum of the equivalent of two full credit classes in the approved IDS class list at the 3000 level or above. The International Development Studies degree at Dalhousie is administered by a programme committee consisting of one faculty member from each major department with a substantial teaching or research interest in the field and is chaired by the coordinator. A joint Dalhousie-Saint Mary's University International Development Studies Committee organises the joint IDS offerings.

Classes Offered at Dalhousie University**Core Required Classes**

IDS 2000R Introduction to Development Studies: This is the entry level course for IDS majors and others wishing a broad overview of the themes and issues which define the study of international development. By means of lectures and discussion groups, students will be encouraged to gain a critical understanding of, for example, economic development, participatory development, development planning and policy, sustainable

development, and how these contribute to, or impede social justice at the national and international levels.

Format: lectures and seminars
Prerequisites: Two first year classes as indicated above under (1)
Enrolment: Limited to 60

IDS 3000R Seminar in Development Studies: This course is a sequel to 2000R, and will focus on theoretical perspectives and development strategies regarding global, regional and national policies.

Format: Seminar
Prerequisites: IDS 2000R
Enrolment: Limited

IDS 4010R Honours Essay Practicum in International Development Studies: Advanced seminar in theory and methodology leading to preparation and defence of honours essay.

Format: Seminar
Prerequisites: IDS 2000R and IDS 3000R
Enrolment: Limited to IDS honours, advanced major, and qualifying year students

IDS Special Classes

IDS 3100A/3101B Special Topics in International Development Studies: staff. A half-year reading class on a particular aspect of international development taught only by special arrangement between individual IDS major or honours students and individual instructors associated with the programme. Available in summers as well as regular sessions.

Format: Individual tutorial
Prerequisites: IDS 2000R

IDS 3201R International Development Studies Through Canada World Youth: Structured tutorials before and after Canadian World Youth (CWY) assignments. This class is intended for CWY participants who wish to earn academic credit related to their work in the Third World. It consists of pre-departure tutorials and post-return paper preparation based on an agreed research topic. IDS faculty will attend CWY orientations. CWY registrants will receive supervised readings in development studies, and directions for field observations. They will be required to keep a journal of their observations and to prepare a research proposal for which they will collect materials while in the Third World. On returning to Canada they will communicate regularly with their advisor as they prepare a brief report on their field experience and an original research paper for evaluation.

Format: Individual tutorial with selected IDS faculty
Prerequisite: None, although high school/university global studies is desirable

Enrolment: Limited to current CWY participants

IDS 4001A/IDS 4002B/IDS 4003C and IDS 4100R Special Topics in International Development Studies: (see IDS 3100A/IDS 3101B)

Prerequisite: IDS 3000R

IDS 4210R Gender and Development: The class will discuss the subject of gender and development in developing countries and in Canada. It aims to help students develop their theoretical understanding, research skills, and policy analysis in this new field of study. It will focus on issues such as education, work, health, the role of the state, and empowerment. Students taking the class at the graduate level will be expected to attain a higher level of achievement and may be required to do additional assignments.

Format: Seminar.
Prerequisite: IDS 3000R or equivalent
Enrolment: Limited to 25 students
Cross-listing: SMU-IDS 622.1, 623.2 & SOC 422.1, 423.2

Listing of Classes routinely accepted within International Development Studies at Dalhousie University. It is possible to take a number of other classes, but only after approval by the coordinator. Some of these other classes are taught at Dalhousie, some at Saint Mary's. Students are thus encouraged also to review the current Saint Mary's calendar offerings. Note: Classes marked "*" are not offered every year so please consult the current timetable, in addition to the calendars, when registering.

Biology

The importance of an understanding of biology for informed contribution to enabling sustainable development to become a reality cannot be over-emphasized. While the class specifically identified as part of the IDS programme is Biology 4650B (Resource Systems and Economic Development), students are also encouraged to explore additional, appropriate biology classes with officials of the Biology Department.

*BIOL 4650B Resource Systems and Economic Development

Comparative Religion

Understanding religion and its influences on human behaviour involves grasping both the meaning of faith in the lives of participants and the critical analysis of outside observers.

- *CREL 2001A or B Judaism
- *CREL 2002A or B Christianity
- *CREL 2003A or B Islam
- *CREL 2011A or B Hinduism

*CREL 2012A or B Chinese and Japanese Religions

*CREL 2013A or B Buddhism

*CREL 3014A or B Love and Death in World Religions

*CREL 3015A or B Myths, Symbols and Rites

*CREL 3532A or B Mystical Consciousness and Modern Science

*CREL 3502A or B The Rise of Modern Science

*CREL 3533A or B Spirituality and Ecology

Earth Sciences

Geology lies behind many of the environmental problems facing humanity today - while energy and mineral resources provide an underpinning of many of the development plans of Third World nations.

ERTH 2410B Environmental and Resource Geology

Economics

A grasp of economic frameworks whereby societies allocate resources (human resources, natural resources and capital) is a prerequisite for understanding development plans and national prospects, development projects and foreign aid, the constraints and possibilities for sustainable development.

*ECON 2238A Industrial Revolution in Europe

*ECON 2239B European Economy in Historical Perspective

*ECON 2241A Comparative Economic Systems: National Economies

*ECON 2250R Applied Class in Economic Development and the Environment

*ECON 3242B Comparative Economic Systems: Economic Organization and Planning

*ECON 3317B Poverty and Inequality

*ECON 3330A or B International Trade

*ECON 3333A or B Theories of Economic Development

*ECON 3336B Regional Development

*ECON 3350A or B Social Cost Benefit Analysis

*ECON 3432R Regional Economics

*ECON 4431A or B International Payments

English and Spanish

Language skills are obviously important for effective communication for those wishing to pursue international development

studies; but through the study of languages important insights about culture and development experience are also to be gleaned. The IDS programme encourages students minimally to study one additional (relevant) language to English.

English

*ENGL 2211R Commonwealth Literature

Spanish

*SPAN 2069A or B Central America to 1979

*SPAN 2070A or B Area Studies on Mexico and Central America

*SPAN 2109A or B Cuba from Colonial Times to 1961

*SPAN 2110A or B The Cuban Cultural Revolution

*SPAN 2130A or B Latin American Dictators in the Novel

*SPAN 2210A or B The Novel of the Mexican Revolution

*SPAN 2230A or B Contemporary Latin American Prose, Part I

*SPAN 2240A or B Contemporary Latin American Prose, Part II

*SPAN 3050R Culture and Society of the Dominican Republic

*SPAN 3070A or B Contemporary Latin American History

Environmental Studies

Most environmental scientists have primary expertise in a particular discipline and work cooperatively with specialists from other disciplines to solve environmental problems. Dalhousie does not offer a B.Sc. major in environmental science - however, current programmes that provide streams emphasizing environmental subjects include Earth Sciences (particularly Environmental Studies) geology and hydrogeology, economics 2250R, marine biology and political science 3585A.

ERTH 2410B Environmental and Resource Geology

POL 3585A or B Politics of the Environment

POL 3590R Politics of the Sea

Health Services Administration

Should resources be allocated to urban hospitals or rural clinics, advanced systems for surgical procedures for heart disease or basic primary health care programmes. Often, in a developing nation, the choices are

difficult and resources extremely limited. Appropriate health services are an essential underpinning for sustainable development.

*MHS 5200B Principles of International Health

History

Just as people need to know who they are and how they arrived there, groups, races, classes, states and nations need a sense of their own past as part of their culture and to guide their future development choices.

HIST 2006A or B After Columbus: Early European Imperialism in the Americas 1450-1650

HIST 2007A or B The Atlantic World: The Expansion of Europe, 1650-1800

*HIST 2131A The Rise of the British Empire

*HIST 2132B The Fall of the British Empire

*HIST 2334A or B The United States, Canada and the World

*HIST 2370A or B The Age of Imperialism 1870-1970

*HIST 2381A or B Latin America: Underdevelopment and Revolution

*HIST 2421A or B Colonial Africa

*HIST 2422A or B Independent Africa

*HIST 2501A or B The Middle East to the First World War

*HIST 2502A or B The Middle East Since the First World War

*HIST 3380A or B Chattel Slaves and Wage Slaves

*HIST 3390A or B The Caribbean: Underdevelopment and Revolution

*HIST 3440A or B African History from Oral Tradition

*HIST 3451A or B South Africa to 1880

*HIST 3452A or B South Africa since 1880

*HIST 3481A or B Women and Development in Africa

*HIST 3482A or B Distortion or Development: African History

*HIST 3612A or B Women in Socialist Countries

*HIST 3910R Health, Hunger, and Population in History

govern their lives in society, and, as well, the differences between their systems of government and those in other countries.

*POL 2300R Comparative Politics

POL 2500R World Politics

*POL 3302A or B Comparative Development Administration

POL 3303A or B Human Rights and Politics

POL 3315A or B African Politics

POL 3340A or B Approaches to Development

*POL 3380A or B Politics in Latin America

POL 3531A or B The UN in World Politics

POL 3535A or B The New International Division of Labour

POL 3540A Foreign Policies of Third World States

POL 3544A or B Political Economy of Southern Africa

*POL 3585B Politics of the Environment

*POL 3590R The Politics of the Sea

Sociology and Social Anthropology

Sociology provides a context within which students learn to think critically about their social environment. Social Anthropology aims at generalizations by comparing structures and processes in major institutions within societies (kinship, political, economic and religious) as well as between societies.

*SOSA 2100R Ecology and Culture

SOSA 2190R Comparative Perspectives on Gender

*SOSA 2230A or B Psychological Anthropology

*SOSA 2370A or B Peoples and Cultures of the World I

*SOSA 2380A or B Peoples and Cultures of the World II

*SOSA 2390R Social Anthropology of the Middle East

*SOSA 2400R Medicine and Health Across Cultures

SOSA 2600R Food and Nutrition Across Cultures

SOSA 3080A or B Social Change and Development

*SOSA 3205R Ethnicity, Nationalism, and Race

*SOSA 3210R Continuity and Change in Rural Societies

Political Science

Political Science is valuable for individuals who want to know more about the values, laws, institutions and policy mechanisms that

Women's Studies

It is important to recognize the implications of gender issues and to be sensitive to how these are viewed in different cultural circumstances. Hence, students are strongly advised to participate in at least one of the following WOST classes.

IDS 4210R Gender and Development

WOST 2800R Comparative Perspectives on Gender

WOST 3310A or B Women and Development in Africa

WOST 3330A or B Women in Socialist Societies

The IDS 'Earth Summit' Prize on Sustainable Development:

A special prize is being awarded to the best essay paper submitted by an IDS student on a theme of direct relevance to the Rio Earth Summit. The prize is only open to Dalhousie and Saint Mary's IDS students at the undergraduate level. Essays should be submitted to the Dalhousie University Coordinator (typed) by 15 March 1994. An interdisciplinary panel will adjudicate. The essay may be written as part of a regular class or specifically for the competition. Additional details can be obtained from the Coordinator's Office at Dalhousie University.

Seminars and Conferences

All IDS students are encouraged to attend the Kilham Lecture Series for 1993-94, as well as the seminar series that are regularly sponsored through the Pearson Institute, the Gorsebrook Institute and SRES. Students are encouraged to incorporate, in their programmes, classes which enable them to take advantage of Dalhousie's commitment to ocean studies, health and sustainable development.

Linguistics

Various departments offer classes in linguistics or in some aspect of linguistic study in the broad sense:

- **Classics** (several classes in Greek and Latin)
- **English** (*ENGL 3201R The English Language, *ENGL 3202R History of the English Language, ENGL 4253R Old English, ENGL 4351R Middle English)
- **French** (*FREN 2050A/B Structure of French Dictionaries, *FREN 3020R Linguistics, *FREN 3025A/B Linguistic Introduction to Aedean Dialectology, *FREN 4010A/B Great Linguists of the 20th Century, FREN 4001A and FREN 4002B History of the French Language, *FREN 4015R Advanced Translation into English, *FREN 4011A/B Lexicology, *FREN 4012A/B The Structure of French: Comparisons with English)
- **German** (various classes)
- **Philosophy** (PHIL 3300A/B Philosophy of Language, *PHIL 4510A/B Topics in the Philosophy of Language, and other relevant classes in logic and on the work of Frege, Russell or Wittgenstein, for example.), **Psychology** (2190 Language and the Brain, 3150 Introduction to Hearing and Speech Mechanisms, 3190 Psychology of Language)
- **Russian** (RUSS 4000R The Structure of Contemporary Standard Russian, RUSS 4950A/B, RUSS 4960A/B, RUSS 4990R Russian Special Topics)
- **Sociology and Social Anthropology** (*SSA 3080R Linguistics and Anthropology)

Further information about these classes will be found under the departmental listings. It should be noted that some of the classes listed may not be offered in the current year.

Math, Statistics, & Computing Science

Location: Chase Building
Telephone: (902) 494-2572
Fax: (902) 494-5130

Chairperson of Department
 R.P. Gupta

Emeritus Professors

M. Edelstein, MSc (Jerusalem), DSo (Technion-Haifa)
 S. Swaminathan, MA, MSc, PhD (Madras)
 A.J. Tingley, PhD (Minnesota)

Professors

J. Borwein, MSc, DPhil (Oxford)
 P. Borwein, MSc, PhD (UBC)
 J.C. Clements, MA (UBC), PhD (Tor)
 M.A.H. Dempster, MS, PhD (Carnegie-Mellon) (Jointly with Business Administration).
 K.A. Dunn, MSc, PhD (Tor)
 C.A. Field, MSc, PhD (Northwestern) (Director of Statistics)
 P.A. Fillmore, MSc, PhD (Minnesota), FRSC
 G. Gabor, MSc, PhD (Eotvos)
 L.A. Grünfelder, PhD (ETH Zurich)
 R.P. Gupta, MSc (Agra), PhD (Delhi)
 P. Keset, PhD (St. Andrews)
 K.J.M. Moriarty, MSc (Dal), PhD (Lond)
 R.J. Nowakowski, MSc, PhD (Calg)
 R. Paré, MSc, PhD (MoG)
 H. Redjevi, MA, PhD (Minnesota)
 M.A. Shepherd, MSc, PhD (Western)
 P.N. Stewart, MA (Berkeley), PhD (UBC)
 W.R.S. Sutherland, MSc, PhD (Brown)
 K.K. Tan, PhD (UBC)
 A.C. Thompson, PhD (Newcastle upon Tyne)
 R.J. Wood, MSc (MoM), PhD (Dal)

Associate Professors

A.A. Coley, PhD (Lond)
 K. Dilcher, MSc, PhD (Queen's)
 A. Farrag, MSc (SFU), PhD (Alberta)
 D. Hamilton, MA, PhD (Queen's)
 C.S. Hartzman, MS (Purdue), PhD (Colorado)
 K.P. Johnson, MSc (Tor), PhD (Brandeis)
 C.C.A. Sastri, MSc (Andhra), PhD (New York) (Director of Mathematics)
 K. Thompson, PhD (Liverpool) (NSERC University Research Fellow) (Jointly with Oceanography)

Assistant Professors

K. Bowen, PhD (California)
 K.E. Manchester, MSc, PhD (Tor)
 A. Sedgwick, PhD (Tor) (Co-op Director and Director of Computing Science)
 B. Smith, MA (Calgary), PhD (Berkeley)
 S. Srinivas, PhD (Ind. Inst. of So.)

D. Teang, MSc (TUNS), PhD (Penn)
 C.R. Watters, MSc (Western), PhD (TUNS)

Lecturers

E. Cameron, MA (Oxon)
 D. Trueman, MSc (Tor)

Computer Systems Manager
 D. Trueman, MSc (Tor)

Learning Centre Director
 P. Stevens, MSc (Delft)

Statistical Consultant
 W. Blanohard, BSc (Dal)

Postdoctoral Fellows

W. Chen, MSc (Nanjing), PhD (Alberta)
 T. Erdelyi, MSc (Eotvos), PhD (S.Cal)
 G. MacDonald, PhD (Tor)
 D. MoManus, MSc (Dublin), PhD (Alberta)
 T. Trappenberg, MSc, PhD (Aachen)

Visiting Professors

W. Longstaff (W.Aust)
 G. Mehta (Queensland)
 J. Yu (China)

Adjunct Professor

H.S. Heaps, MA (Tor), LLD (St.FX)
 H.S.P. Jones, BSc (Wales), MSc (Southampton)
 M. Rahman, PhD (Windsor)

Honorary Research Associates

M. Beattie (MtA)
 F. Bennett (MSVU)
 P. Cabillo (Acadia)
 R. Dawson (St. Marys)
 V. Huse-Eastwood (Acadia)
 L. Oliver (Acadia)
 R. Rosebrough (MtA)
 S. Sanlevidi (Dal)

Cross Appointment

B. Eastwood (Community Health and Epidemiology)
 M. Crowley (Education)

Information concerning programmes and classes in Mathematics follows immediately below. For Computing Science or Statistics, please refer to the corresponding section of this Calendar.

Mathematics

Location: Chase Building
 Telephone: (902) 494-2572
 Fax: (902) 494-5130

Director of Division
 C.C.A. Sastri

Faculty Advisors
 C.C.A. Sastri (Undergraduate)
 R. Peré (Honours)
 W.R.S. Sutherland (Graduate)
 A. Sedgwick (Co-op)

General Interest Classes

The Division offers several classes for non-majors who would like to know something about Mathematics.

- **Math 1000/1010:** This core calculus class is the starting point for any degree programme in the sciences.
- **Math 1001/1002:** A class designed especially for B.A. students and others who wish to know something about the historical and cultural aspects of mathematics.
- **Math 1080:** An introduction, through examples drawn from a wide variety of disciplines, to the basic ideas of statistics.
- **Math 1110/1120:** Linear algebra and calculus arranged to meet the needs of commerce students, but of interest to anyone wishing a brief introduction to either of these topics.

Degree Programmes

One full credit in Mathematics other than Mathematics 1001/1002 and 1110/1120 is required for a BSc degree.

Honours in Mathematics

The following programme is normally followed by students who plan to take honours in Mathematics. Entering students who have a strong interest or background in mathematics, or who contemplate taking honours, should enroll in Math 1500 and Math 1670/2670.

Year 2: Mathematics 2130 and 2500

Years 3 and 4: Mathematics 3030, Mathematics 3500 and five additional classes at least two of which are numbered 4000 or above.

Students may choose programmes with a concentration in Applied Mathematics, Computing Science, Pure Mathematics or Statistics. Students wishing to concentrate in

Computing Science should consider Combined Honours in Mathematics and Computing Science, and examine the separate Calendar entry for Computing Science. Students wishing to concentrate in Statistics should consider Honours in Statistics or Combined Honours in Mathematics and Statistics, and examine the separate Calendar entry for Statistics. All honours programmes must be approved by the Chairperson. Students wishing to take an Honours degree concentrating in Applied Mathematics are advised to consider a programme similar to the following:

Year 1: 1500R; 1670A/2670B; CS1400A; CS1410B; 2 elective classes

Year 2: 2500R; 2130R; 2060A; 2080B; 2270B; (Co-op Seminar) and 1 1/2 elective classes

Year 3: 3500R; 3030R; 3110A; two of 3210, 3300A, 3260B, an appropriate statistics class; 1 1/2 elective classes

Year 4: 4400; the remaining two of 3210, 3300A, 3260B, an appropriate statistics class; 1 1/2 other classes at the 4000 level; 2 elective classes.

Students wishing to take an Honours degree concentrating in Pure Mathematics are advised to consider a programme similar to the following:

Year 1: 1500R; 1670A/2670B; CS1400A; CS1410B; 2 elective classes

Year 2: 2500R; 2130R; another full mathematics class; 2 elective classes

Year 3: 3500R; 3030R; another full mathematics class; 2 elective classes

Year 4: 4010A; 4140A; three other full mathematics classes, at least one of which is at the 4000 level; 1 elective class.

It is recommended that the additional mathematics classes include a statistics class, an applied class and a class in algebra, topology or complex variables.

Honours Comprehensive Examination: The Honours Comprehensive Examination in mathematics consists of a written paper of about 20-30 pages researched and prepared by the student during the spring term. The topic is decided on in conjunction with the supervisor of the Honours seminar. The paper is also presented to the seminar. The Honours Comprehensive Examination in statistics requires successful completion of Statistics 8880.

Combined Honours

Students interested in taking honours in mathematics or statistics and another subject

as a combined programme should consult the chairman of the department through whom a suitable course of study can be arranged.

A combined honours programme may be appropriate for many. Students contemplating a combined honours course in mathematics or statistics and another subject should, however, bear in mind that the work in either subject would probably be insufficient for admission to a regular graduate programme. A qualifying year would usually be necessary.

Advanced Major and Major in Mathematics

Students who plan to major in Mathematics should arrange a programme in consultation with the department.

For both the 15-credit major and the 20-credit advanced major in Mathematics, the following classes are required: Mathematics 2000 (or 2001A/2002B or 2490/2490 or 2500) and 2030/2040 (or 2130). In all other respects, the requirements of these programmes are as in Section 11 of the College of Arts and Science regulations.

Those students whose first registration in Arts and Science was for the academic year 87/88 or earlier should consult the calendar of the appropriate year.

Majors in Mathematics are strongly urged to include Computing Science 1400, 1410 as part of their programme.

Students wishing to concentrate in Applied Mathematics, Pure Mathematics or Statistics are advised to consider modelling their programmes on the first three years of the Mathematics or Statistics Honours programmes, after possibly replacing 2130R with 2030A and 2040B, 2500R with 2000R, or 2001A and 2002B, and 3500R with 3090A and 3100B.

Those students who wish to arrange inter-disciplinary programmes (with such fields as Physics, Chemistry, Biology, Engineering, Psychology and Economics) are invited to discuss their interests with the department.

Co-operative Education Programmes

The Co-operative Education Programme is an integrated programme of 8 academic terms and 4 work terms of relevant industrial/laboratory employment. The work terms, each of 4 months duration, are spent in industrial and laboratory positions. The work experience helps students see the applicability of their training in mathematics, statistics and computing science and helps them make intelligent career choices. Upon successful completion of the programme the student's transcript indicates that the programme was a cooperative one.

A Co-op degree normally takes 4 1/3 years. The co-op programmes are available either as an Advanced Major (20-credit) degree programme or as an Honours degree programme.

There are three Advanced Major Co-op programmes; one in each division of the Department.

There are four Honours Co-op programmes available within this Department, in the areas of:

- Mathematics
- Mathematics and Computing Science combined
- Computing Science
- Statistics

A Combined Honours Co-op degree, combining Mathematics or Computing Science or Statistics and another appropriate subject, is possible. Students interested in such a programme should consult the Director of Co-op Education.

Students who are interested in Co-operative Education Programmes in the Department should consult the Co-operative Education in Science entry in this calendar for further information.

Prerequisites and Performance Test

The prerequisites listed in the class descriptions indicate the mathematical background expected of students entering that class, but may be waived with the consent of the instructor. In addition to the listed prerequisites students may write a short preliminary performance test before enrolling in the following classes: 0010R, 1000A or B, 1060A or B, 1110B, & 1120A.

These preliminary tests are held regularly during the summer and during fall registration. Students are urged to make arrangements for taking these tests as soon as possible. Further information is obtainable by contacting the department or the Math Learning Centre (902-494-2484).

Classes Offered

Class descriptions for Computing Science can be found in the calendar under Computing Science. Class descriptions for Statistics can be found in the calendar under Statistics.

Credit may not be obtained twice for the same class even if the numbers have been changed.

Classes with the designation (MLC) are supported by the tutorial services of the Math Learning Centre.

Classes marked with an asterisk (*) may not be offered every year.

MATH 0010R Pre-University Mathematics, "Classroom Version": This class does not count as part of the regular student class load. This class is designed for students who do not have the usual prerequisites for first-year math classes (i.e. N.S. Math 441), or for others who wish to strengthen their background in mathematics. The class begins with a review of algebra, use of variables, exponents, absolute value, factoring methods and solution of equations and inequalities. This leads to graphing and the functional approach which is the focus of the class. Functions studied include linear, quadratic, inverse, exponential, logarithmic and trigonometric. Throughout the year, there is strong emphasis on the use of mathematical models to solve application problems. Students completing this class should not only be adept at the mechanics of mathematics, but also have an understanding of the uses of these skills. After successful completion of this class, the student will have the necessary prerequisites for any first-year university mathematics, statistics or computing science class. Students register and pay for this class at Henson College, Centre for Continuing Studies, 8100 University Avenue.

Format: Lecture 3 hours, (non-credit class), MLC

Prerequisites: Performance test

Note: Mathematics 1000 and Mathematics 1010 introduce the basic ideas of the calculus, and together constitute a solid foundation for study in the Sciences (Physics, Chemistry, Biology, etc.), as well as for further study in Mathematics. The class Mathematics 1000 is offered in both terms. Students who require one or both of these classes, but are uncertain of their ability to handle them, are invited to make use of the diagnostic and remedial services offered in the Mathematics Learning Centre, located in the basement of the Chase Building.

MATH 1000A or B/C Differential and Integral Calculus: A self-contained introduction to differential and integral calculus. The topics include: functions, limits, differentiation of polynomial, trigonometric, exponential and logarithmic functions, product, quotient and chain rules, applications of differentiation, antiderivatives and definite integrals, integration by substitution. A sequel to this class is Mathematics 1010.

Format: Lecture 3 hours, tutorial 1 hour, MLC

Prerequisites: Nova Scotia Mathematics 441 or equivalent

Exclusion: Credit will be given for only one of Mathematics 1000, 1120

Enrolment: Limited to 80 per section

MATH 1001A Mathematics for Liberal Arts Students I: For students who wish to become acquainted with mathematics as an art rather than as a tool for the sciences. A selection of elementary topics will be discussed with a view to illuminating historical and cultural aspects of the subject. Required work will include a series of written reports on assigned readings and a major essay. This class cannot be used to satisfy the B.Sc. mathematics requirement.

Format: Lecture 3 hours, MLC

Prerequisite: None

MATH 1002B Mathematics for Liberal Arts Students II: Same as 1001A above, but with a different set of topics. Either one or both of 1001A and 1002B may be taken for credit. This class cannot be used to satisfy the BSc Mathematics requirement.

Format: Lecture 3 hours, MLC

Prerequisite: None

MATH 1010A or B Differential and Integral Calculus: A continuation of the study of calculus with topics including: techniques of integration, elementary differential equations and applications, Riemann sums, parametric equations and polar coordinates, sequences and series, Taylor series.

Format: Lecture 3 hours, tutorial 1 hour, MLC

Prerequisites: Mathematics 1000

Enrolment: Limited to 80 per section

MATH 1060A or B Introductory Statistics for Science and Health Sciences: For description see Statistics 1060.

Format: Lecture 3 hours, tutorial 1 hour, MLC

Prerequisites: Nova Scotia Math 442 or equivalent

Cross-listing: Statistics 1060A or B

Enrolment: May be limited

MATH 1110 A or B Finite Mathematics for Commerce: This class provides an introduction to the methods of finite mathematics with special emphasis on applications to business. Topics include linear equations, systems of linear equations, matrices, determinants, matrix inverses, linear programming including the simplex method, an introduction to nonlinear functions and the elements of the mathematics of finance. This class replaces half of the previous class Math 1100R. This class may not be used to partially satisfy the requirement that BSc students must have at least one full university class in mathematics.

Format: Lecture 3 hours, MLC

Prerequisite: Nova Scotia Mathematics 442 or equivalent

MATH 1120 A or B Calculus for Commerce:

This is an elementary calculus class with special emphasis on applications to business. Topics include functions, limits, rate of change, derivatives, one variable optimization and curve sketching, exponential functions, logarithmic functions, functions of several variables, Lagrange multipliers, elementary integration. This class replaces half of the previous class Math 1100R. This class may not be used to partially satisfy the requirement that BSc students must have at least one full university class in mathematics.

Format: Lecture 3 hours, MLC

Prerequisite: Nova Scotia Mathematics 442 or equivalent

Exclusion: Credit can be given for only one of Math 1120, and Math 1000

MATH 1500R Calculus: This class is intended primarily for students who anticipate taking an honours programme in the physical or mathematical sciences. The topics of Mathematics 1000/1010 are covered, but in greater depth. Mathematics 1500 is equivalent as a credit to Mathematics 1000/1010.

Format: Lecture 3 hours, tutorial 1 hour

Prerequisite: High standing in Nova Scotia Mathematics 441 or equivalent

Exclusion: Credit can be given for only one of Mathematics 1000/1010 and 1500

MATH 1670A Discrete Structures I: This class together with Math 2670 offers a survey of those areas in Mathematics which may be classified as dealing with discrete structures. Areas covered include set theory, mathematical induction, number theory, relations, functions, algebraic structures and introductory graph theory. The topics to be discussed are fundamental to most areas of Mathematics and have wide applicability to Computing Science.

Format: Lecture 3 hours

Prerequisite: Nova Scotia Mathematics 441 or equivalent

Cross-listing: Computing Science 1670

MATH 2000R Intermediate Calculus: This class deals with the calculus of functions of several variables. Topics include: continuous functions and their fundamental properties, partial derivatives and applications, multiple integrals, geometry of Euclidean vector spaces with emphasis on three dimensions, elementary differential equations.

Format: Lecture 3 hours, MLC

Prerequisite: Mathematics 1010

Exclusion: Students who take Math 2000 may not also receive credit for 2400 or 2480/2490

MATH 2001 A or B: This is the first half of Math 2000R; essentially it deals with differential calculus of functions of several variables. It is meant primarily for co-op students who cannot take a year-long class.

Format: lecture, 3 hours

Prerequisite: Math 1010

Exclusion: Credit can be given for only one of the following classes: Math 2000R, Math 2480, and Math 2001.

MATH 2002A or B: This is the second half of Math 2000R and is a continuation of Math 2001A.

Format: lecture, 3 hours

Prerequisite: Math 2001

Exclusion: Credit can be given for only one of the following classes: Math 2000R, Math 2490 and Math 2002.

MATH 2030A Matrix Theory and Linear Algebra I: This class, together with Mathematics 2040, is a self-contained introduction to Matrix Theory and Linear Algebra. Topics include: vector spaces, linear transformations, determinants, systems of linear equations. Students should note that this is a second-year class and, although it has no formal first-year prerequisites, mathematical maturity and an ability to handle formal proofs at the level of a student who has completed Mathematics 1000 is expected.

Format: Lecture 3 hours, MLC

Prerequisite: Nova Scotia Mathematics 441 or equivalent

MATH 2040B Matrix Theory and Linear Algebra II: This class is a continuation of Mathematics 2030. Topics include: similarity, diagonalization, inner product spaces.

Format: Lecture 3 hours, MLC

Prerequisite: Mathematics 2030 and 1000

Exclusion: No more than one credit can be given for Mathematics 2030/2040 and 2130

***MATH 2050R Problems in Geometry:** This class is organized around a sequence of stimulating geometrical problems. A set of approximately 20 challenging problems is given to the students at the beginning of the year. The students are expected to attempt these problems throughout the year. Good students should be able to do some of these problems and are encouraged to present their solutions to the class for extra credit on the final grade. These problems are chosen so that their solutions use a wide variety of geometrical ideas (from Combinatorial, Projective, Inversive, Transformational, Topological, Differential and Non-Euclidean Geometry).

Format: Lecture 3 hours

Prerequisite: Mathematics 1010

Exclusion: Credit can be given for only one of Math 2050R and Math 2051A or B.

***MATH 2051 A or B Problems in Geometry:**

A half class on such material from Mathematics 2050R as time permits.

Format: Lecture 3 hours

Prerequisite: Mathematics 1010

Exclusion: Credit can be given for only one of Math 2050R and Math 2051A or B.

MATH 2060A or B Introduction to Probability and Statistics I: For description see Statistics 2060.

Format: Lecture 3 hours, MLC

Prerequisite: Mathematics 1000/1010

Cross-listings: STAT 2060, ECO 2060

MATH 2080B Statistical Methods For Data Analysis & Inference: For description see Statistics 2080.

Format: Lecture 3 hours, MLC

Prerequisite: Math/Statistics 1080

Cross-listings: STAT 2080, ECO 2080

MATH 2130R Linear Algebra: For students who are interested in a broader and more basic understanding of the theory and techniques of linear algebra than is provided by 2030 and 2040. Topics include: the material of 2030 and 2040, canonical forms including the Rational Form and Jordan Form, inner product spaces including the Spectral Theorem for normal operators on finite dimensional vector spaces, linear programming and further topics in pure and applied linear algebra. This class provides an excellent background for further study in Mathematics.

Format: Lecture 3 hours

Prerequisite: Mathematics 1010

Exclusions: Only 1 credit can be given for MATH 2030/2040, & 2130

MATH 2300A or B Mathematical Modelling I:

This class is designed to provide a bridge between introductory calculus and the applications of mathematics to various fields. By using fundamental calculus concepts in a modelling framework, the student investigates meaningful and practical problems chosen from common experiences encompassing many academic disciplines, including the mathematical sciences, operations research, engineering and the management and life sciences. Some simple user-friendly computer packages will be introduced.

Format: Lecture 3 hours, MLC

Corequisites: Math 2030 and Math 1000

MATH 2400B Vector Calculus: This class

provides a careful development in three-dimensional space of the following topics: partial derivatives, gradients, Jacobians, Hessians, Taylor's theorem,

iterated integrals, and integral theorems. The geometrical and physical applications in three-dimensional space, including the following, will be stressed throughout the class; Newton's equations - dynamics of systems of particles (including linear and angular momentum, moments of a vector, moments of inertia), scalar and vector fields and the grad, div and curl operators, cartesian coordinates - rotating axes - curvilinear coordinates and their applications (coriolls and centripetal forces).

Format: Lecture 3 hours

Prerequisite: Mathematics 1010 or 1500

Exclusion: Credit will not be given for more than one of Mathematics 2000, 201/2002, 2400 and 2480/2490

MATH 2480A/2480B Intermediate Calculus for the Engineering Programme: The topics

for these two half classes include functions of several variables, partial derivatives, multiple integrals, indeterminate forms, improper integrals, infinite series, power series, Taylor and MacLaurin series, matrices, determinants, systems of linear equations, complex numbers, elementary ordinary differential equations.

Format: Lecture 3 hours, MLC

Prerequisite: Mathematics 1010

Exclusion: Students who take Math 2480/2490 may not also receive credit for 2000, 2001, 2002, or 2400

MATH 2500R Introductory Analysis: For honours students and other serious students of mathematics. This class forms the first half of a 2-year sequence in analysis and advanced calculus; Mathematics 3500 completes the sequence. Topics include: real and complex numbers, set theory, elementary topology of Euclidean space, limits and continuity, differentiation, the Riemann integral, power series, series of functions.

Format: Lecture 3 hours

Prerequisite: Good standing in Mathematics 1010

***MATH 2540A Basic Set Theory:** An introduction to the basic topics of set theory, including equivalence relations, order, recursion, the axiom of choice, ordinals and cardinals.

Format: Lecture 3 hours

Prerequisite: Mathematics 1000

***MATH 2600 A or B Theory of Interest:** A detailed examination of the theory of simple and compound interest. The syllabus includes the material on which the theory of interest portion of Examination 4 in the Society of Actuaries examination series is based. Some of the topics are: nominal and effective rates of interest and discount, force of interest,

annuities, perpetuities, price of bonds, callable bonds, special topics. This class should appeal to students in mathematics, economics and commerce. Students interested in an actuarial career should take this class and are urged to consult the department for guidance in class selection and additional information.

Format: Lecture 3 hours, MLC
Prerequisite: Mathematics 1010 or 1110
Cross-listing: STAT 2600

MATH 2670B Discrete Structures II: This class continues Math 1670. This course covers some basic concepts in discrete mathematics which are of particular relevance to students of computer science, engineering, and mathematics. The topics to be covered will include: Solution of Recurrence Relations, Generating Functions, Modular Arithmetic, Chinese remainder theorem, Trees and graphs, Finite state machines, Groups and rings, Boolean algebras.

Format: Lecture 3 hours
Prerequisite: Math 1670
Cross-listing: COMP 2670B

***MATH 2800 A or B Applied Mathematics for the Life Sciences:** This class is intended as a preparation for the mathematical aspects of advanced classes in ecology, genetics and physiology and is designed primarily for honours students in the biological sciences. The topics to be covered include complex numbers, linear algebra, difference equations and differential equations. Students are introduced to each topic through examples drawn from appropriate areas of biology and physiology. Computer software packages such as MINITAB, MATLAB and MAPLE are used to solve specific problems. This class is not given every year and students interested should consult the department. Students interested in the applications of mathematics should also consider Mathematics 2300 and/or Mathematics 3280.

Format: Lecture 3 hours, MLC
Prerequisites: Mathematics 1000 and Biology 1000

SCI 3000R Science Fundamentals: An interdisciplinary class that stresses the motivations, methodologies, and responsibilities of scientists, and provides extensive formal instruction in written and oral communication of scientific material. For details, see main calendar entry "Science, Interdisciplinary." The status of this class (elective, minor, or major credit) varies from department to department; check with your undergraduate advisor.

MATH 3030R Abstract Algebra: In this first class in abstract algebra the following topics are treated: groups, sub-groups, factor groups, homomorphisms, rings, ideals,

Euclidean domains, polynomial rings, fields, unique factorization, irreducible polynomials, Sylow theorems, solvability of polynomial equations, Galois theory, and the Jordan canonical form.

Format: Lecture 3 hours
Prerequisite: Mathematics 2040 or 2130

***MATH 3040 A or B Metric Spaces and Elementary Topology:** Topics include: metric spaces: bounded-, totally bounded-, compact- and complete sets in metric spaces; Lipschitz and contraction mappings; topological spaces; open and closed sets, bases; continuity, compactness, connectedness.

Format: Lecture 3 hours
Prerequisites: Mathematics 2000 and 2130 (or 2040)

***MATH 3050R Differential Geometry and Tensor Analysis:** The material consists of two parts. The first part discusses the theory of curves and surfaces in three-dimensional Euclidean space. Topics include: theory of curves, surfaces, first and second fundamental forms, Gaussian and mean curvature, formulae of Weingarten and Gauss, geodesic curvature and geodesics. The second part consists of an introduction to Riemannian geometry, and, if time permits, an introduction to general relativity as an application of Riemannian geometry. Topics include: foundations of tensor calculus, differentiable manifolds, foundations of Riemannian geometry, absolute differentiation and connections.

Format: Lecture 3 hours
Prerequisites: Mathematics 2000 and 2130 (or 2040)

***MATH 3070 A or B Theory of Numbers:** The following topics are discussed: congruences and residues; elementary properties of congruences; linear congruences; theorems of Fermat, Euler and Wilson; Chinese remainder theorem; quadratic residues; law of quadratic reciprocity; Legendre, Jacobi and Kronecker symbols, arithmetic functions; algebraic fields; algebraic numbers and integers; uniqueness of factorization, definition and elementary properties of ideals; ideal classes and class number.

Format: Lecture 3 hours
Prerequisite: Mathematics 2040

***MATH 3080 A or B Introduction to Complex Variables:** An introduction to the basic elements of complex analysis. Topics include: complex numbers, functions, differentiation and integration in the complex plane, some special mappings; series in general, Taylor and Laurent Series, residues, some principles of conformal mapping theory.

Format: Lecture 3 hours
Prerequisite: Mathematics 2000

MATH 3090A Advanced Calculus I: An Introduction to Fourier Series. Topics covered include half range expansions, expansions on other intervals, convergence theorems, differentiation and integration of Fourier Series and the Complex form of Fourier Series. Also an introduction to special functions, including Gamma and Beta functions and orthogonal polynomials and some of their properties is given. Additional topics covered include some implicit function theorems and an introduction to transformations.

Format: Lecture 3 hours
Prerequisites: Math 2000 and Math 2030
Exclusion: Credit cannot be given for both Math 3090A and Math 3500

MATH 3100B Advanced Calculus II: Topics covered include properties of functions defined by integrals: differentiation under the integral sign, tests for the convergence of improper integrals, improper multiple integrals and functions defined by improper integrals. Also considered is the Fourier integral and various other integral transforms, a review of multiple integrals and vector field theory. Green's, Stokes' and the divergence theorems and related matters are also considered.

Format: Lecture 3 hours
Prerequisite: Mathematics 3090
Exclusions: Credit cannot be given for both Mathematics 3500 and 3100B.

MATH 3110A Differential Equations: One of the aims of this class is to give students the ability to analyze and solve a number of different types of differential equations. Wherever possible, applications are drawn from the fields of physics, chemistry, biology, and other areas. The class is intended mainly for mathematics students interested in applications and for science students who wish to be able to solve problems arising in their major areas of interest.

Format: Lecture 3 hours, MLC
Prerequisites: Mathematics 2000

MATH 3120B Differential Equations: The topics discussed are of great importance to any student interested in applied mathematics. Areas include Fourier series, orthogonal polynomials, Sturm-Liouville problems, the classical partial differential equations, and some applications to physics, chemistry and engineering.

Format: Lecture 3 hours
Prerequisites: Mathematics 3110

MATH 3170A Introduction to Numerical Linear Algebra: For description see Computing Science 3170A.

Format: Lecture 3 hours
Prerequisites: Mathematics 1010, 2030 and Computing Science 1410
Cross-listing: COMP 3170A

***MATH 3210B Introduction to Numerical Analysis:** Some more advanced aspects of numerical linear algebra, including the Power Method and the QR Algorithm are examined. Various acceleration procedures for iterative processes are examined. Several forms of interpolating polynomials including Newton, Lagrange and Hermite are considered. Finite differences are also introduced. Numerical differentiation and integration is examined. In particular, interpolatory, Gaussian, Romberg and adaptive quadrature are discussed, and error estimates considered. Polynomial splines and some of their properties are introduced. Methods for solving nonlinear equations including the Newton-Raphson method are considered. Special attention is paid to finding the roots of a polynomial.

Throughout, the difficulties of implementing the various methods are discussed, and illustrated via assignments. Finally, some indication of the difficulties involved in multidimensional numerical analysis is given.

Format: Lecture 3 hours
Prerequisites: Mathematics 2270, (or 2500)
Cross-listing: COMP3210B, and previously part of 3200R

***MATH 3220B Numerical Solutions of Ordinary Differential Equations:** Initial Value Problems are considered. Various methods, including Runge-Kutta and Predictor-Corrector are examined. The convergence and stability of the numerical methods is investigated and propagated error bounds and estimates sought. Also considered are starting techniques, variable order and/or variable step length strategies and automatic error control. Systems of equations and Stiff equations are discussed. Various methods for solving Boundary Value Problems (e.g. shooting methods and collocation) are also discussed. Throughout, the difficulties of implementing various methods are discussed and illustrated via assignments and the use of various computer packages. A brief introduction to the numerical solution of Partial Differential Equations may also be included.

Format: Lecture 3 hours
Prerequisites: Mathematics 3110, 3210, 3090 (or concurrent registration in 3500.)

***MATH 3230B Applied Approximation Theory:** A review of orthogonal polynomials and their properties is given, and basic concepts, function norms, and orthogonal

systems are introduced. The best approximation to a function in the Euclidean norm is obtained. The Weierstrass Approximation Theorem is given and Runge's phenomenon discussed. We also consider characterizing the best approximation in the uniform norm and methods for obtaining this best approximation. Economization of power series is also discussed. Fourier approximation is discussed, and the Fast Fourier Transform is examined. An introduction to Rational and Padé approximation is given and these techniques are compared with polynomial approximation techniques. Throughout, the difficulties of implementing the various methods is discussed and illustrated via assignments.

Format: Lecture 3 hours

Prerequisites: Mathematics 3210, 3090 (or concurrent registration in 3500)

MATH 3260 A or B Mathematical Modelling II: This class is an introduction to mathematical modelling and analysis using intermediate level calculus and elementary differential equations. It includes such topics as "can we prove mathematically that relativistic effects explain the precession in the perihelion of Mercury?", "is there truth to the legend of Samson and the Euler column?", "how do we quantify and analyze traffic flow?", "how does mathematics prove that a guitar is more musical than a drum?", and "what is an economically optimal forest harvesting strategy?"

Format: lecture 3 hours

Prerequisite: Math 3110 (may be taken concurrently)

MATH 3300A Optimization I: This class is an introduction to the concepts and applications of linear and nonlinear programming. Topics include the simplex method for linear programming, duality and sensitivity analysis, convex programming, Kuhn-Tucker and Lagrange multiplier conditions, numerical algorithms for unconstrained and constrained problems. Some of these topics are illustrated by means of interactive computer packages.

Format: Lecture 3 hours

Prerequisites: Mathematics 2000 and 2040

MATH 3310B Optimization II: This class continues the study of the topics in 3300. Additional topics to be covered include network flow theory, graph theoretic matching problems, shortest route problems, discrete dynamic programming models, and combinatorial optimization with emphasis on integer programming problems.

Format: Lecture 3 hours

Prerequisites: Mathematics 2000 and 2040

***MATH 3320 A or B Applied Group Theory:** This interdisciplinary half-classes is intended for third and fourth-year undergraduates and first-year graduate students in Chemistry, Mathematics and Physics. With some additional reading in Physics, it is equivalent to Physics 4480A. Topics include: review of matrices, fundamentals of groups, normal subgroups, homomorphisms, representations, character, orthogonality, symmetry groups in crystallography, role of symmetry groups in quantum physics and chemistry, normal modes and molecular vibrations.

Format: Lecture 3 hours

Prerequisites: Mathematics 2000 and 2030

***MATH 3330 A or B Graph Theory and Combinatorics:** The following topics are discussed: elements of graph theory, paths and cycles, Eulerian graphs, trees, planar graphs and the Euler polyhedral formula, Hamiltonian graphs, chromatic numbers, the five-colour theorem; items to be selected from the following topics to suit class: graphs and matrices, graphs and groups, extremal problems, and enumeration problems.

Format: Lecture 3 hours

Prerequisites: Mathematics 2000 and 2040

MATH 3340 A or B Regression and Analysis of Variance: For description see Statistics 3340.

Format: Lecture 3 hours

Prerequisites: Statistics 2080, Mathematics 2030, and either Math 1010 or Statistics 2060

Cross-listing: STAT 3340

MATH 3360 A or B Probability: For description see Statistics 3360.

Format: Lecture 3 hours

Prerequisites: Statistics 2080 and Mathematics 2000

Cross-listing: STAT 3360

MATH 3380 A or B Sample Survey Methods: For description see Statistics 3380.

Format: Lecture 3 hours

Prerequisites: Statistics 2080

Cross-listing: STAT 3380

MATH 3460 A or B Intermediate Statistical Theory: For description see Statistics 3460.

Format: Lecture 3 hours

Prerequisites: Statistics 3360

Cross-listing: STAT3460

MATH 3500R Intermediate Analysis: Mathematics 3500 continues the analysis sequence begun in Mathematics 2500. Topics include: number systems, metric spaces, compactness, continuous functions on metric spaces, Stone-Weierstrass theorem, Arzela-Ascoli theorem, sequences and series of functions and their properties, inverse and implicit function theorems, extreme, co-ordinate transformations.

Format: Lecture 3 hours

Prerequisites: Mathematics 2130, 2500
Exclusions: Credit cannot be given for both Mathematics 3500 and 3090A, or for both Math 3500 and 3100B

MATH 4010/5010 A or B Introduction to Measure Theory and Integration: A discussion of Lebesgue's theory of measure and integration on the real line. The topics include: the extended real number system and its basic properties; the definition of measurable sets, Lebesgue measure and the existence of non-measurable sets; the Lebesgue integral; differentiation of monotonic functions (e.g. the Cantor function), absolute continuity, the classical Lebesgue spaces, Fourier series.
Format: Lecture 3 hours
Prerequisite: Mathematics 3500

***MATH 4020/5020 A or B Analytic Function Theory:** A second half-class in complex function theory. Topics include: review of analytic complex functions including topological properties of the plane, Mobius mappings, exponential, logarithmic, trigonometric and related functions, integration and the Cauchy theorem. Cauchy's integral formula, residues, harmonic functions, analytic continuation, entire and meromorphic functions, some results of conformal mapping, including the Riemann mapping theorem.
Format: Lecture 3 hours
Prerequisites: Mathematics 3090 and either 3100 or 3500

MATH 4025/5025 A or B Commutative Algebra I: This introduction to commutative algebra includes a selection of the following topics: prime and maximal ideals, primary decomposition, Noetherian rings, Hilbert's Basis Theorem and the Nullstellensatz.
Format: lecture, 3 hours
Prerequisite: Math 3030R or equivalent

MATH 4035/5035 A or B Commutative Algebra II: This class will examine some geometric applications of the material developed in Commutative Algebra I. Topics will include plane curves and Bezout's theorem, cubic curves, higher dimensional varieties, and an introduction to the Riemann-Roch Theorem.
Format: lecture, 3 hours
Prerequisite: Math 4025

MATH 4045/5045 A or B Advanced Algebra I: Topics may include: structure of groups, rings, fields, and modules; Galois theory. Other topics of special interest may be covered.
Format: Lecture 3 hours
Prerequisites: MATH 3030

MATH 4055/5055 A or B Advanced Algebra II: Topics may include: Algebras over a field, classical representation theory of groups and algebras, lattices, Boolean algebras. Additional topics may be covered at the discretion of the instructor.
Format: Lecture 3 hours
Prerequisite: MATH 3030

MATH 4060R Advanced Statistical Theory: For description see STAT 4060.
Format: lecture, 3 hours
Prerequisite: STAT 3460

MATH 4065/5065 A or B Algebraic Geometry: an introduction to the basic concepts of algebraic geometry.
Format: Lecture 3 hours
Prerequisites: MATH 3030

MATH 4070/5070 A or B Topics in Number Theory: The course is intended to give an introduction to both analytic and algebraic number theory. Following a short review of basic notions from elementary number theory, there will be a detailed discussion of quadratic reciprocity and some of its applications and extensions. The main topics from analytic number theory will be arithmetic functions a Dirichlet L-series, resulting in a proof of Dirichlet's theorem on primes in arithmetic progressions. Finally, some fundamental properties of algebraic number fields will be discussed, with some emphasis on quadratic and cyclotomic fields.
Format: Lecture 3 hours
Prerequisites: Math 3070

***MATH 4080/5080 A or B Time Series Analysis II:** For description see Statistics 4080.
Format: Lecture 3 hours
Prerequisite: Stats 4350, 4390 or permission of instructor
Cross-listing: STAT 4080

MATH 4090/5090 A or B Probability: A mathematically rigorous treatment of probability theory in Euclidean space. Topics include the definitions and properties of random variables and their distribution functions, various convergence concepts, the Borel-Cantelli lemma, weak and strong laws of large numbers, characteristic functions, central limit theorems. Although the necessary measure theory is introduced, a previous analysis class is an asset.
Format: Lecture 3 hours
Prerequisite: Mathematics 3360 and a third year analysis class
Cross-listing: STAT 4090

***MATH 4130/5130 A or B Analysis of Algorithms:** See class description for CS 4130A or B.

Format: Lecture 3 hours

Prerequisites: CS 3690 (with a grade of C— or better)

Cross-listing: COMP 4130

MATH 4135/5135 A or B Introduction to Category Theory: Categories, functors, natural transformations and adjointness are introduced with emphasis on examples drawn from undergraduate Mathematics and theoretical Computer Science. The calculus of diagram chasing, limits, colimits and Kan Extensions is explored in detail to provide a thorough foundation for subsequent specialized classes.

Format: Lecture 3 hours

Prerequisites: Math 3030 or permission of the instructor.

***MATH 4140/5140 A or B Introduction to Functional Analysis:** An introduction to the basic principles of functional analysis including the following topics: infinite dimensional vector spaces, normed spaces, inner-product spaces, Banach and Hilbert spaces, linear and continuous linear functionals, the Hahn-Banach Theorem, the principle of uniform boundedness, dual spaces, weak* topology, and the Alaoglu theorem, the open mapping and closed graph theorems, and consequences and applications.

Format: Lecture 3 hours

Prerequisites: Mathematics 2130 and 3040 or 3500

***MATH 4150/5150 A or B Functional Analysis:** Topics include: topological vector spaces, locally convex spaces, normability, function spaces, strict convexity, uniform convexity, reflexive spaces, support functionals, geometry of convex sets and other topics.

Format: Lecture 3 hours

Prerequisites: Mathematics 4140

***MATH 4160/5160 A or B Operator Theory:** An introduction to the theory and applications of continuous linear operators on Hilbert spaces, culminating with the spectral theorem, and including such topics as spectrum; adjoint; symmetric, self-adjoint, unitary, and normal operators; polar decomposition; differential and integral operators; C^* algebras; Gelfand's Theorem; and the spectral theorem.

Format: Lecture 3 hours

Prerequisites: Mathematics 4010 and 4140

***MATH 4170/5170 A or B Introduction to General Topology:** An introduction to topological spaces, and includes the following topics: classification in terms of cardinality of bases, separation, etc., product spaces,

Tychonoff theorem, compactness, compactifications, Tychonoff spaces, metrization.

Format: Lecture 3 hours

Prerequisite: Mathematics 3040 or 3500

***MATH 4180/5180 A or B Introduction to Algebraic Topology:** An introduction to algebraic topology and including the following topics: homotopy type and the fundamental group, geometry of simplicial complexes, homology theory of complexes, chain complexes, homology groups for complexes, subdivision, induced homomorphisms, axioms for algebraic topology, singular homology, the singular complex, properties of cell complexes.

Format: Lecture 3 hours

Prerequisites: Mathematics 4170

***MATH 4190/5190 A or B Differential Equations:** Mathematics 3120 is recommended. Topics covered include existence and uniqueness theorems, continuity of solutions, Floquet theory, autonomous differential equations and their relation to dynamical systems and flows, periodic solutions and the Poincaré-Bendixson theorem.

Format: Lecture 3 hours

Prerequisites: Mathematics 3500 (3090 and 3100) and 2030/2040 or 2130

***MATH 4200/5200 A or B Differential Equations - Qualitative Theory:** Qualitative theory is concerned with what can be determined about the phase-portrait and the general behaviour of solutions of differential equations even though those solutions are not explicitly exhibited. Topics are selected from Liapunov stability theory, stable and unstable manifolds of singular points and periodic solutions, classification of plane singular points, structural stability, differential equations on manifolds and Hamiltonian systems. Various equations occurring in applications are qualitatively analysed. The precise topics and equations covered depend on the specific interests of the instructor and the students.

Format: Lecture 3 hours

Prerequisite: Mathematics 4190

***MATH 4220/5220 A or B Introduction to Partial Differential Equations:** This class is the first half of a two term sequence designed to introduce the student to the theoretical and numerical aspects of partial differential equations. Topics to be covered include: review of the theory of ordinary differential equations, classification of partial differential equations, solution of first order equations, the diffusion equation and random

walk, Fourier Series and transforms, generalized functions, eigenfunction expansions.

Format: Lecture 3 hours

Prerequisite: Mathematics 3110

***MATH 4230/5230 A or B Partial Differential**

Equations: This class continues the study of partial differential equations begun in 4220A.

Topics to be covered include: The Rayleigh-Ritz method, Green's Functions, finite difference methods of solution, an introduction to the finite element method.

Format: Lecture 3 hours

Prerequisite: Mathematics 4220

***MATH 4270/5270 A or B Numerical**

Software: See class description for CS 4270 A or B.

Format: Lecture 3 hours

Prerequisite: CS 3210 (with a grade of C— or better)

Cross-listing: COMP 4270

***MATH 4300/5300 A or B Optimal Control**

Theory and Applications: Initially the classical calculus of variations is studied and the sufficiency conditions emphasized. A constructive solution of the Euler equations is presented. Then the modern theory of optimal control is developed using techniques of mathematical programming. This approach is applied to a variety of problems such as economic growth theory, inventory control and regulator problems. Numerical methods are also presented.

Format: Lecture 3 hours

Prerequisite: Consent of instructor

***MATH 4310/5310 A or B Nonlinear**

Programming: A thorough introduction to the mathematical problem of optimizing a real-valued function of n variables subject to a system of constraints. Theoretical topics include the theory of convex sets and functions, directional derivatives, the Karush-Kuhn-Tucker optimality conditions, and dual problems. Several algorithms will be developed for the numerical solution of problems, including quasi-Newton and barrier methods. Software packages will be used to solve several practical applications.

Format: Lecture 3 hours

Prerequisite: Math 3500 (or 3090 and 3100) and 2130 (or 2030 and 2040)

***MATH 4400/5400 A or B Mathematical**

Modelling in Science and Industry: This class is concerned with the construction, analysis and interpretation of mathematical models in the natural sciences with an emphasis on industrial applications. Specific applications of potential theory, diffusion phenomena and wave propagation will be examined in detail. A brief introduction to the calculus of

variations approach to the optimal control of dynamical systems will be given and some recent applications discussed.

Format: Lecture 3 hours

Prerequisites: required Mathematics 3110, recommended Mathematics 3120

MATH 4650/5650 A or B Relativity and

Cosmology: A review of differential geometry will be given followed by an introduction to the general theory of relativity. Various topics will be discussed, including: linearized theory and gravitational radiation, spherically symmetric metrics and the Schwarzschild Solution, gravitational collapse, black holes, and cosmology.

Format: Lecture 3 hours

Prerequisites: Math 3050R or permission of the instructor.

Cross-listing: Physics 4650/5650

***MATH 4660/5660 A or B Automata and**

Computability: For description see Computing Science 4660.

Format: Lecture 3 hours

Prerequisites: Computer Science 1410; a 3000 level Mathematics class such as 3030

Cross-listing: COMP 4660

MATH 8700 (non-credit) Co-op Seminar I

MATH 8891 Co-op Work Term I

MATH 8892 Co-op Work Term II

MATH 8893 Co-op Work Term III

MATH 8894 Co-op Work Term IV

Microbiology and Immunology

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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), (Diagnostic Virology; Interferon)
 D.E. Mahony, PhD (McG), (Bacteriology; Bacteriophage, Toxins and Plasmids of Clostridia)
 K.R. Rozeas, PhD (Dal), (Microbial Pathogenesis; Epidemiology)
 D.B. Stoltz, PhD (McM), Undergraduate Studies Coordinator, (Biology of Parasitic Insects; Insect Virology)
 C. Stutterd, PhD (Dublin), (Microbial Genetics)

Associate Professors

R.I. Carr, MD (Tor), PhD (Rockefeller), Prof., Medicine (Rheumatology) (Immunoregulation; CNS Immune System Interactions and Auto Immune Diseases)
 P.S. Hoffman, PhD (Virginia Polytech.) (Microbial Pathogenesis), Graduate Studies Coordinator
 A.C. Issekutz, MD (Dal), FRCP(C), Prof., Pediatrics (Inflammation)
 T. Lee, PhD (Glasgow) (Molecular Immunology; Transplantation Immunology)
 R. Rajaraman, PhD (Dal), Asst. Prof., Medicine (Cancer Cell Biology; Cell-Extracellular Matrix Interactions)

Assistant Professors

M.A. Drebot, PhD (Dal) (Viral Diagnostics and Pathogenesis)
 R. Duncan, PhD (Guelph) (Molecular Basis of Viral Host-Range Restriction)
 G. Faulkner, PhD (Dal) (Ultrastructural Analysis of Infection and Cancer Cells)
 D.J.M. Haldane, MBChB (Dundee), FRCP(C) (Medical Microbiology)

D.W. Hoeklin, PhD (McG) (Immunology; Natural Suppressor Cells; MHC-Unrestricted Killer Cells)

T.B. Issekutz, MD (Dal), FRCP(C), Assoc. Prof., Pediatrics (Cell-Mediated Immunity)
 A.W. Stadnyk, PhD (McM) (Intestinal Inflammation; Cytokines)

Introduction

The Department of Microbiology and Immunology is involved in teaching and research in several vital areas of biomedical endeavour including molecular and medical microbiology, virology, immunology and microbial genetics.

The Microbiology programme is designed to familiarize the student with the biology and pathogenesis of viruses, bacteria, yeast and multicellular parasitic organisms. Advanced classes deal specifically with selected aspects of virology, molecular mechanisms of pathogenesis, microbial genetics, cell and molecular biology.

A set of classes in molecular genetics has been identified to meet the needs of honours Microbiology or Biochemistry students who hope to pursue further study in molecular and genetic approaches to fundamental problems. These classes provide solid grounding in bacterial and eukaryotic gene structure and function, regulation and evolution, and both practical and theoretical presentations of current and developing methodology (genetic engineering). The classes can be fully integrated with training in metabolism, enzymology, bacteriology, virology and immunology provided by the two departments, and they provide a good practical grounding in the recombinant DNA methods which have become essential in fields as diverse as genetic diagnosis and gene therapy, forensics, industrial microbiology, and molecular evolution (see below and the Biochemistry listings, and consult departmental advisors).

The Department also has a significant teaching programme in Cellular and Molecular Immunology. The immunology programme is designed to facilitate the education of students interested in fundamental questions in molecular immunology, tumour immunology, autoimmunity or inflammation as well as in areas more directly applicable to defence against microbial infection.

These programmes provide the education required for future professional activities upon graduation or for graduate studies in microbiology and/or immunology.

Degree Programmes

There is a 4 year "advanced major" programme in Microbiology but no 3 year programme leading to a Microbiology major. Students wishing to include Microbiology in other programmes should take MICR 2100A, which is a prerequisite for most other microbiology classes offered at Dalhousie. Students interested in an honours programme (see below) should consult with the departmental advisors, preferably prior to registration for 2nd year classes. Biology majors are advised that classes in Microbiology and Immunology DO count toward a BSc in Biology even though they are not cross-listed with the Biology Department.

BSc with Honours in Microbiology

This programme is designed to give students the best possible background for future graduate work or a professional career in microbiology or immunology. Students applying for admission to this programme must have obtained a grade of B- or better in BIOL 1000R or BIOL 1001R and must, in their 2nd year, obtain a grade of B- or better in MICR 2100A. Students should consult an undergraduate advisor (D. Stoltz; C. Stuttard; D.W. Hoskin) at their earliest convenience. Note: general requirements for honours programmes are given in Degree Requirements 1.3, page 100.

Required Classes

The following classes are required classes for this degree programme: BIOL 1000R or BIOL 1001R; CHEM 1010B; "Writing Class"; MATH (1 credit); MICR 2100A; BIOL 2020A or B; BIOL 2030A or B; BIOC 2200B; CHEM 2400R; BIOC 3400A; MICR 4900R. Note that this list contains 4.5 credits above the 1000 level.

In addition to these required classes students must take at least one half class at the 3000-4000 level in 3 of the 5 following core subjects: Bacteriology, Virology, Immunology, Microbial Genetics, and Cell Biology. (BIOL 3020 satisfies the cell biology requirement, but does not count as a microbiology credit.) In addition to the "required classes", a total of 4.5 credits in the discipline of microbiology (see list below) must be taken to satisfy the requirements of 9 credits beyond the 1000 level for the honours degree.

For students wishing to specialize in molecular genetics, the following classes are strongly recommended: MICR 3033B, MICR 4037A/MICR 4038A, MICR 4118A, MICR 4403A, MICR 4404B and MICR 4601A.

Students should also consult an undergraduate advisor (C. Stuttard or D. Stoltz).

For students wishing to specialize in the area of Immunology the following classes are recommended: MICR 3033B, 3115A, 4115B; BIOC 3200A MICR 4026A, 4027B, 4301A, 4302B, 4601A Immunology students should consult the Immunology undergraduate advisor, Dr. D.W. Hoskin.

Notes:

1. In the 3 half-classes taken to fulfil the core subjects requirement described above, students must maintain a B average with no grade less than B-.
2. The minor can be in any subject (excluding Microbiology); this includes Biology and Biochemistry.
3. The honours research thesis (MICR 4900R) can be done in either the Microbiology, Biochemistry or Biology Departments (or in other departments in the Faculty of Science or Medicine if appropriate). The thesis work, however, must be relevant for the Department.
4. Students should be aware of Academic Regulation 19, page 94. Students should also note that certain advanced classes require a particular grade be achieved in the prerequisite class and/or permission of the instructor be obtained for registration in the class, or both.
5. Classes considered to fall within the discipline of Microbiology are:

Microbiology

- 3033B Microbial Genetics
- 3114A Introductory Virology
- 3115A Introductory Immunology
- 3118B Medical Bacteriology
- 4022A/B Microbial Ultrastructure Project
- 4024A Microscopy
- 4026A The Mammalian Cell
- 4027B The Cancer Cell
- 4037A Genetics of Industrial Bacteria
- 4038A Molecular Biology of Yeast
- 4114B Topics in Basic and Medical Virology
- 4115B Topics in Immunology
- 4118A Molecular Pathogenesis
- 4301A Immunobiology
- 4302B Molecular Immunology
- 4601A Laboratory Techniques in Molecular Biology

Biochemistry

4403B Structure, Organization and Replication of Genes

4404A Gene Expression

4603A Advanced Laboratory in Biochemical Techniques

Biology

2101B Microbial Diversity

3100B Aquatic Microbiology

3113 Microbial Physiology

3322B Parasitology

4113B Biology of the Prokaryotic Cell

BSc with Combined Honours in Microbiology and Biochemistry

Students in this programme must complete 11 credits above the 1000 level in Microbiology and Biochemistry. The required classes in Biochemistry are BIOC 2200B, 3200A, 3300B, 3400A and 4603A. Students must also get 1.5 credits in 3 out of 5 core subject areas in Microbiology. In addition, students must take MICR 2100A, BIOL 2020A or B, BIOL 2030A or B and either MICR 4900R or BIOC 4602R. The remaining 5 credits must include at least 1 full credit from each Department at the 4000 level (excluding MICR 4900R and BIOL 4602R).

BSc with Combined Honours in Microbiology and Biology

Students in this programme must complete the core requirements of each department. Students are required to maintain an average grade of B in core classes with no grade lower than B-. Biology 1000R should be taken in year 1, and Microbiology 2100A in year 2. Research thesis work can be carried out in either Department. Advisors: D.B. Stoltz (Microbiology); J. Wrights (Biology).

Classes Offered

Note: Owing to the combined pressures of student numbers and a dearth of available space, the names of students not appearing on the first day of class may be deleted from class lists; students are therefore advised that being signed into the class is no guarantee of late admission.

MICR 2020B General Microbiology: This class is geared to students in pharmacy and in other health-oriented programmes. It provides a brief introduction of microbial structure, physiology and genetics in relation

to microbial pathogenesis. General concepts and practices of sterilization and disinfection, antibiotics and immunity will be examined with emphasis on mechanism of action. Bacterial, fungal, parasitic and viral pathogens of medical importance will be discussed according to the mode of entry, transmission, clinical features, prevention and chemotherapy. Laboratory sessions using demonstration and/or experimentation are designed to complement the lectures and to provide a practical appreciation of the isolation, identification, cultivation and control of microorganisms.

Instructor: S.H.S. Lee
Format: lecture 3 hours, lab 3 hours
Prerequisite: BIOL 1000R or instructor's consent
Cross-listing: PHYT 2070A

MICR 2100A Introductory Microbiology: An introduction to the basic concepts of microbiology through lectures, laboratory sessions, and demonstrations. Topics include the structure, growth, genetics and physiology of selected groups of microorganisms and viruses, as well as basic immunology. This is a required class for Microbiology honours students, and for students going into Dentistry at Dalhousie. Lab section assignments are made during the first lecture period. Consequently, because of limits to lab space, students not attending that

lecture may be denied admission to the class **EVEN IF THEY ARE ALREADY REGISTERED**; in particular, students must be registered prior to admission to laboratory periods, beginning in the second week of each term. Students wishing to repeat the class must have approval to do so from the class coordinator. MICR 2100A is the preferred route into other microbiology offerings.

Instructor: D.B. Stoltz
Format: lecture 2 hours, lab 3 hours
Prerequisite: a grade of B- or better in BIOL 1000R or BIOL 1001R. **Note:** Biology students taking BIOL 2101B are advised that this class may be used as a prerequisite into 3000-level Microbiology classes provided that a grade of B or better has been obtained.

MICR 3033B Microbial Genetics: Heredity in bacteria and their viruses, with principal emphasis on mutation, gene transfer, and genetic mapping; DNA repair, recombination, and restriction; molecular approaches to genetic analysis and gene expression on microorganisms (e.g., gene cloning, DNA sequencing).

Instructors: C. Stuttard; C. Barnes

Format: lecture 2 hours, lab/tutorial 3 hours
Prerequisites: MICR 2100A or BIOL 2101B (with a grade of B or better), BIOL 2030, or instructor's consent

Prerequisite: grade of B- or better in MICR 2100A or grade of B or better in BIOL 2101B

MICR 4022A or B Microbial Ultrastructure Project: A research project using one or more of the skills acquired in MICR 4024A, selected by the student in consultation with an instructor.

Instructors: K.B. Easterbrook, D.B. Stoltz; G.T. Faulkner

Prerequisite: MICR 4024A or instructor's consent

MICR 4024A Microscopy: The class is concerned with biological ultrastructural analysis concentrating on transmission and scanning electron microscopy. The importance of a proper understanding of the physical and chemical principles governing technical procedures such as fixation, freeze-fracture, colloidal gold probes, stereology, autoradiography, x-ray microanalysis and photography is emphasized. During laboratory periods students have the opportunity through individual projects to participate in some of the techniques covered in the lectures. This class is designed primarily for honours and graduate students.

Instructors: G.T. Faulkner, K.B. Easterbrook, D.B. Stoltz; M. Willeon

Format: lecture 3 hours, no formal lab

Prerequisite: instructor's consent

Cross-listing: BIOL 4024A

MICR 4026A The Mammalian Cell as a Microorganism: The class considers recent advances and current concepts in cellular and molecular biology with reference to the mammalian cell cultured in vitro. The following general areas are discussed: cell cycle; differentiation; somatic cell aging; extracellular, cytoplasmic and nuclear matrices; transmembrane interactions; gene expression; growth factors and their receptors; hybridoma technology; mutagenesis and somatic cell and molecular genetics.

Instructor: R. Rajaraman

Format: lecture 3 hours

Prerequisite: BIOL 2030A or B or BIOL 2020 or instructor's consent

MICR 4027B Molecular Mechanisms of Cancer: The class considers recent cellular and molecular biology of cancer cells viewed as microorganisms in vivo. Students participate by giving seminars on recent articles and by writing term papers on selected topics. The following general areas are discussed: types of tumours; the transformed phenotype; extracellular matrix and neoplasia; hormones and neoplasia;

MICR 3114A Introductory Virology: Viruses are extremely efficient parasitic nucleic acids that have played, and continue to play, significant roles in the analysis of gene organization and expression, cancer biology, molecular pathogenesis, cell biology, biotechnology, gene therapy and molecular evolution. This introductory class is designed to give the student an appreciation for the diversity of viruses and their biological interactions with the host at both a cellular and organismal level. Topics discussed include virus structure, assay, characterization, gene organization and expression, host-cell interactions, cell transformation and pathogenesis. The lecture material relies on concepts introduced in BIOC 2200 and BIOL 2030 and complements material presented in other classes such as immunology, cell biology, biochemistry, molecular biology and gene expression.

Instructor: R. Duncan, D.B. Stoltz, guest lecturers

Format: lecture 3 hours

Prerequisite: MICR 2100A or BIOL 2101B (with a grade of B or better), BIOC 2200, BIOL 2030

MICR 3115A Introductory Immunology: This class is designed to provide the student with an understanding of the fundamental principles of cellular and molecular immunology. Lectures will focus on mechanisms governing the generation and regulation of cell-mediated and humoral immune responses. Topics to be discussed include cells and tissues of the immune system, the structure and synthesis of antibodies, complement pathways, T cell subsets and their functions, hypersensitivity reactions and the genetics of the immune response.

Instructor: D.W. Hoekhn

Format: lecture 3 hours

Prerequisite: MICR 2100A or BIOL 2101B (with a grade of B or better), a 2000-level class in cell biology, or instructor's consent

MICR 3118B Medical Bacteriology: A survey of several bacterial groups with particular attention devoted to bacteria of medical interest. Attention is given to those criteria which are regarded as important in the classification of bacteria, and to the techniques used to identify particular species.

Instructor: D.E. Mahony

Format: lecture 2 hours, lab 3 hours

anchorage and growth control; analysis of malignancy by cell fusion; transformation by DNA and RNA viruses, and by radiation; chemical carcinogenesis; oncogenes; interferon and cancer; reverse transformation and chemoprevention of cancer; immunoresponse and cancer; anti-oncogenes, transgenic mice in cancer research and cellular basis of metastasis.

Instructor: R. Rajaraman
 Format: lecture/seminar 3 hours
 Prerequisite: MICR 4026A or instructor's consent

MICR 4037A Genetics of Industrial Bacteria:

We review specific aspects of genetic structure, regulation, transmission and recombination in bacteria that are used to synthesize medically and commercially useful products. The principal focus is on *Streptomyces* spp., and includes consideration of genome architecture and stability, and genetic control of morphological and physiological development. Seminars consider recent research in the field.

Instructor: C. Stutterd
 Format: lecture/seminar 3 hours
 Prerequisite: MICR 3033B

MICR 4038A Molecular Biology of Yeast:

The class will focus on the use of genetics and molecular genetics in the investigation of a wide variety of cellular activities in the yeast *Saccharomyces cerevisiae*, including: genome organization, regulation of gene expression at both transcriptional and translational levels, signal transduction, role of oncogenes, secretion, and control of proliferation. Wherever possible, the role of particular yeast gene products will be compared to homologues found in other eukaryotic cells including mammalian cells. This class will consist of lectures and student seminars and will rely heavily on the recent primary literature. Participants in the class will be encouraged to discuss and evaluate recent advances in the areas of genetics and molecular biology.

Instructor: C. Barnes, G. Johnston
 Format: lecture/seminar 4 hours
 Prerequisite: MICR 3033B

MICR 4114B Topics in Basic and Medical Virology:

A class for advanced students designed to look in detail at selected aspects of virology. The class consists of lectures and student seminars revolving around current advances in virological research. Laboratory sessions expose students to basic methods associated with virology including tissue culture, phage assays, viral macromolecular synthesis and analysis of host cell interactions.

Instructors: R. Dunoan, D.B. Stoltz, M. Drabot, K.B. Easterbrook
 Format: lecture 2 hours, lab 3 hours

Prerequisite: grade of B- or better in MICR 3114A

MICR 4115B Topics in Immunology of Host Resistance:

An advanced class in which students read and discuss research papers taken from the current literature in immunology. While all major areas of immunology are discussed, particular emphasis is placed on mechanisms involved in the host immune response to pathogens and tumour cells.

Instructor: D.W. Hoekn
 Format: lecture/discussion 3 hours
 Prerequisite: a minimum grade of B in MICR 3115A

MICR 4118A Molecular Pathogenesis:

An advanced class on the molecular basis of bacterial pathogenesis. The class will use selected bacterial pathogens to develop basic principles regarding genes, regulatory mechanisms and the molecular function of gene products in surface colonization, invasion, intracellular growth and toxin production. The class will be taught from reviews and original research papers and will emphasize the use of modern molecular biological tools in problem solving.

Instructor: P.S. Hoffman
 Prerequisite: MICR 3033B plus an advanced class in Bacteriology (MICR 3118B preferred)

MICR 4301A Immunobiology:

An advanced class designed to examine the experimental approaches which have led to our current knowledge of the biological characteristics of the immune system, including its cells and the interactions between them; the idiotypic network; antigen processing and presentation; the mucosal immune system; CNS-immune system interactions; and both normal and pathological autoimmunity. Cytokines and inflammation; the host response to infection; lymphocyte migration; and immunodeficiency will also be discussed.

Instructors: R. Carr, T. Issekutz, A. Issekutz
 Format: lecture and discussion 3 hours
 Prerequisite: MICR 3115A and/or instructor's consent

MICR 4302B Molecular Immunology:

An advanced class which investigates the molecules involved in the generation and expression of immune responses. Topics typically include the structure and function of cytokines, the generation of antibody diversity by immunoglobulin gene rearrangement, the structure and function of cell surface receptors such as the T cell antigen receptor, MHC and adhesion molecules, and the molecular interactions which lead to immune non-responsiveness.

Instructors: T. Lee, A.W. Stadnyk, B. Pohajdek

Format: lecture, student presentations, discussion

Prerequisite: MICR 3115A and/or instructor's consent

Cross-listing: BIOL 4302B

MICR 4403B Structure, Organization, and Replication of Genes: (see Biochemistry Dept.)

MICR 4404A Gene Expression: (see Biochemistry Dept.)

MICR 4601A Laboratory Techniques in Molecular Biology: This class consists of a series of laboratory modules covering techniques used in molecular biology and immunology (each of 4 weeks duration, 6 hours per week). The class is intended primarily for honours and graduate students. Students should consult the Department regarding eligibility and availability of space.

Instructor: G.C. Johnston

Format: lab 6 hours

Cross-listing: BIOL 4012A/BIOC 4603A

MICR 4700R Special Topics: Consult Department.

MICR 4701A/4702B Special Topics: Consult Department. This class is intended to permit further study of a specific topic of interest, or to correct a deficiency in a student's programme.

MICR 4900R Honours Research and Thesis
Coordinator: D.B. Stoltz

Music

Location: Dalhousie Arts Centre, 5th floor, University Ave., Halifax, N.S.
Telephone: (902) 494-2418
Fax: (902) 494-1637

Chair

W.H. Kemp (494-1142)

Student Advisors

W.H. Kemp (494-2442) - Years III-IV, BMus
 P. Perron (494-2418) - MusEd

Professors

W.H. Kemp, MusBac, MusM (Tor), AM (Harv), DPhil (Oxon) (Theory and History)
 C. van Feggelen, (Guitar and Lute)
 D.P. Schroeder, AMus, BA, MA (Western) PhD (Cantab), (Theory and History)

Associate Professors

P. Djokic, BMus, MMus (Juilliard), (Violin)
 D.M. Farrell, BA (St. Norbert Col), MMus, PhD (Wisc), (Theory and Composition)
 E. Gonnella-Weloh, Dipl of Art (Dundee Col of Art), LRAM (Royal Academy Lond), (Voice)
 P.A. Perron, BMus (McG), MMusEd (Holy Names College), (Music Education)
 L. Stodola, BMus (Chio), MMus (Juilliard), (Piano)
 J.S. Tittle, BS (Kent State), MM, DMA (Wisc), (Theory and Composition)

Assistant Professors

G. Servant, BMus (Dal), MMus, DMA (Hartt)
 T. Zonneveld, Dipl (Teach), Dipl (School Mus), Dipl (Performance), (Royal Conservatory, The Hague), (Piano)

Part-Time Faculty

N. Babiniau (mus.ed. string studies)
 T. Hill, MA (Calif, Davis), (mus.ed. band studies)
 D. MacDonald, BMusEd (Dal), Dipl Mus (Paris) MMA (McGill) (organ and church music)
 D. Palmer (jazz studies)

Applied Skills Instructors

Flute: P. Creighton BMus (Tor);
 E. DuBois, BMus (Rochester), MMus (Emporia State)
 Oboe: Suzanne Lemieux
 Clarinet: J. Rapeon
 Bassoon: I. Rothwell
 Recorder: P. Evans
 Saxophone: D. Palmer
 Horn: R. McCoeh
 Trumpet: J. Stern, BMus, MMus (New England Conservatory)

Trombone and Tuba: H. Schoales
 Cello: S. Wait
 String Bass: L. Turofsky, BMus (Tor);
 M. Kasper
 Percussion: J. Faraday
 Harpsichord: D. MacDonald

Staff Piano

Accompanist: H. Murray, BAHonMus, LRCT (Tor) ARCCO
 Technician: F. Haines

Introduction

The resources of the Music Department provide a thorough discipline to those whose demonstrated talent and specific pre-university training qualify them for specialization in music studies. Certain classes and ensembles are available to the non-specialist student who wishes to increase both musical awareness as a listener and involvement as a performer.

In the Bachelor of Music Programme, the Department offers training to the prospective professional musician: performer, composer, theorist, historian or critic. Future teachers instructing in the elementary and secondary school classroom are provided with methods, skills and field experience in the Bachelor of Music Education Programme. In our society today there are many vocations in which a working knowledge of various aspects of music is a desirable part: librarianship, media programming and production, arts management, recreational and therapeutic work, to name only a few. A carefully chosen BA (General) or combined Honours programme could furnish a basic equipment for further studies in preparation for such professions. The truly contemporary listener, too, must acquire style-specific tools, if there is to be an informed response to the musical experience.

Thus the University's Music Department is ready to serve many needs within a general standard of excellence. Crafts and skills, history, practice and appreciation are presented in studies flexible enough to be useful to each student's identity as a musical person.

Classes for Non-Majors

Classes offered as arts electives for non-majors are as follows:
 MUS 1000R Listening to Music
 MUS 1001A Materials of Music
 MUS 1002B Introductory Music Theory
 MUS 2007R Guitar and Lute
 MUS 2008R Modern Guitar
 MUS 2087R Electronic and Experimental Music
 *MUS 2011R History of Opera
 *MUS 2012R Music and Psychology

- *MUS 2013R The Evolution of Jazz
- *MUS 2021R Music and Literature
- *MUS 3064B Women in Canadian Music

Other classes in Music may be taken by special permission of the department.

Note: Classes marked * are not offered every year. Please consult the current timetable on registration to determine if this class is offered.

Degree Programmes

Foundational Classes

These offerings are designed for certain prospective music majors who, in the opinion of the faculty, are in need of a more prolonged exposure to non-major levels of performance, music literature, and skills in musicianship.

Students admitted at this level are considered in the University Explorations category, and may take a maximum of three credit classes.

Curriculum

- MUS 0070C Foundational Aural Perception (non-credit)
- MUS 0071C Foundational Keyboard Skills (non-credit)
- MUS 0100R Foundational Applied Skills (non-credit)
- MUS 1000R Listening to Music
- MUS 1001A Materials of Music
- MUS 1002B Introduction to College Music Theory
- 1 Music Ensemble (non-credit)
- Required Writing Class (from another department - see list of writing classes, page 95)

Special Notes:

1. Music classes MUS 1000R, MUS 1001A, and MUS 1002B, although credit classes, may not be counted toward the BMus, BMusEd, or BA degree with a major in Music; however, they may be counted as electives in other BA or BSc Degree Programmes.
2. All students registered in the Foundational Classes shall not enrol in the First Year Classes of the Bachelor of Music Core Curriculum until all prerequisites for those classes are completed.
3. The foundational music classes and the required writing class must be taken in the same academic year.

Standard for Foundational Classes

- Minimum grades:
- MUS 0070C - C+
 - MUS 0071C - C+
 - MUS 0100R - B
 - MUS 1000R - C
 - MUS 1001A - C
 - MUS 1002B - C
 - Writing Class - C
 - Each Elective - C

Bachelor of Music (BMus)

The BMus is a four-year programme with sixteen out of twenty classes in music. Upon successful completion of the second year, students may choose to concentrate in performance, music history and literature, or composition, or elect the unconcentrated programme.

Common Curriculum

First Year: MUS 1000-level Applied Skills; MUS 1350A History of Music I (Med./Ren.) MUS 1351B History of Music II (Baroque); MUS 1201A Theory I.; MUS 1202B Theory II; MUS 1270C Aural Perception I; MUS 1271C Keyboard Skills I; and an Arts and Social Sciences or Science Elective, one full credit (Writing Class Elective).

Second Year: MUS 2000-level Applied Skills; MUS 2350A History of Music III (Classical); MUS 2351B History of Music IV (Romantic); MUS 2201A Theory III; MUS 2202B Theory IV; MUS 2270C Aural Perception II; MUS 2271C Keyboard Skills II; and an Arts and Social Sciences or Science Elective, one full credit.

Concentration in Performance

Third Year: MUS-3000 level Applied Skills; MUS 3281C Form and Analysis I; MUS 3351B Music Since 1950; MUS 3280C Counterpoint; MUS 3282C Orchestration; MUS 3199C Recital; Music Elective, one half credit; and an Arts and Social Sciences or Science Elective, one full credit.

Fourth Year: MUS 4000-level Applied Skills; MUS 4199C Area Graduation Requirement (Recital); MUS 4281C Form and Analysis II; Music Elective, 2 credits; and an Arts and Social Sciences or Science Elective, one full credit.

Note: Church Music Option - Organ majors may complete a curriculum in church music by successful achievement in the following classes taken in the Third and Fourth Years: MUS 4271C, MUS 4370C, MUS 4198C, and the half-credit class in church music offered at the Atlantic School of Theology and taken through letter of permission.

Concentration in Composition

Third Year: MUS 3000-level Applied Skills; MUS 3281C Form and Analysis I; MUS 3351B Music Since 1950; MUS 3280C Counterpoint; MUS 3282C Orchestration; MUS 3210R Composition; and an Arts and Social Sciences or Science Elective, one full credit.

Fourth Year: MUS-4000 level Applied Skills; MUS 4280C Advanced Harmony and Counterpoint; MUS 4281C Form and Analysis II; MUS 4210R Composition; MUS 4299C Area Graduation Requirement (Composition); Music Elective, one half credit; and an Arts and Social Sciences or Science Elective, one full credit.

Concentration in History and Literature

Third Year: MUS 3000-level Applied Skills; MUS 3281C Form and Analysis I; MUS 3351B Music Since 1950; MUS 3280C Counterpoint; MUS 3282C Orchestration; MUS 3382A Music in Canada to 1950; Music elective; one half credit; and an Arts and Social Sciences or Science Elective, one full credit.

Fourth Year: MUS 4000-level Applied Skills; MUS 4281C Form and Analysis; MUS 4369A or B & MUS 4369A or B Special Studies; MUS 4399C Area Graduation Requirement (Thesis); Music Elective, one credit; and an Arts and Social Sciences or Science Elective, one full credit.

Unconcentrated Programme

Third Year: MUS 3000-level Applied skills; MUS 3281C Form and Analysis I; MUS 3351B Music Since 1950; MUS 3280C Counterpoint; MUS 3282C (Orchestration); Music elective, one full credit; and an Arts and Social Science or Science elective, one full credit.

Fourth Year: MUS 4000-level Applied Skills; MUS 4282C Form and Analysis; MUS 4599C Graduation Requirement, Unconcentrated; Music Elective, two credits; and an Arts and Social Science or Science elective, one full credit.

Standards

All students wishing to enter third year required Music classes other than MUS 3351B in the BMus programme must successfully complete their MUS 2000-level Applied Skills and MUS 2202B, MUS 2270C and MUS 2271C and achieve an overall average of B- in the music classes of the first and second years, including a minimum standing of C in each of MUS 1201A, MUS 1202B, MUS 2201B and MUS 2202B, and a minimum of B- in each of their MUS 2000-level Applied Skills, MUS 1270C and

MUS 2270C. Students failing to demonstrate the required standards in MUS 2270C must repeat the class, but, with the permission of the Department, those with an otherwise satisfactory academic achievement may do so concurrently with their third year curriculum, within the five full classes or as an approved overload.

Students wishing to enter the concentration in performance must achieve an average of B+ in their MUS 1000- and MUS 2000-level Applied Skills; in history and literature, an average of B+ in MUS 1350A, MUS 1351B, MUS 2350A and MUS 2351B and demonstrate acceptable writing ability; in composition, submit one or more original pieces for assessment by the composition faculty.

Students in the BMus programme must maintain a minimum standing of B- in each of the music classes of the third and fourth years.

Students who at the end of the third year have not obtained at least five credits of B or better in their music classes above the 1000 level will not be admitted to the fourth year without the explicit recommendation of the Department and the prior approval of the Committee on Studies.

Students must achieve a minimum standing of C in each of their Arts and Social Sciences or Science electives.

Bachelor of Music Education (BMusEd)

The four-year B.Mus.Ed. programmes in elementary and secondary music education offer training in an instrument or in voice; theoretical and historical knowledge; aural and keyboard skills; the methods and repertoires needed by the music teacher in the classroom; and the foundational principles of education. Observation and field experience in classroom settings constitute an important part of the programmes. These programmes lead to certification by the Nova Scotia Department of Education.

In the First and Second Years students will enrol in the Bachelor of Music programme common curriculum (q.v.); Second Year students are advised to take two Education Foundation half credit classes. After successful application to the Department students will proceed to the B.Mus.Ed. programmes, Third and Fourth Years, choosing between curricula in Classroom Music or Instrumental Music. Normally these programmes are as follows:

Classroom Music

Third Year: MUS 3000-level Applied Skills; MUS 3400R Elementary Methods; MUS 3470C Field Experience; MUS 3160A

Conducting; MUS 3181B Choral Technique; MUS 3351B History of Music VI (Contemporary Music); Music 3471C Solfa; and a half credit elective in Music or Music Education.

Fourth Year: MUS 4000-level Applied Skills; MUS 4400C Secondary Methods; MUS 4470C Field Experience; MUS 4482A Choral Arranging; Education 4400R and one-half Education Foundation credit; and one full credit elective in Music, Music Education, or Arts and Social Sciences or Science.

Instrumental Music

Third Year: MUS 3000-level Applied Skills; MUS 3351B History of Music VI (Contemporary Music); Either MUS 3480C Band Instruments or MUS 3481C String Instruments; MUS 3400R Elementary Methods; and MUS 3470C Elementary Field Experience; MUS 3180A Conducting; MUS 3471C Solfa; and a half credit in Music or Music Education.

Fourth Year: MUS 4000-level Applied Skills; MUS 4400C Secondary Classroom Teaching Methods; MUS 4470C Secondary Classroom Field Experience; MUS 3282C Orchestration; either MUS 4481C Band Methods and Field Experience or MUS 4483C String Methods and Field Experience; and Education 4400R and one-half Education Foundation credit.

Bachelor of Music Education/Bachelor of Education (BMusEd/BEEd)

The five year BMusEd/BEEd integrated programmes in elementary and secondary music education combine the curricula of the B.Mus. Ed. programmes with additional training in either elementary classroom teaching or a second teachable subject appropriate for secondary school. The B.Mus.Ed./B.Ed. leads to certification by the Nova Scotia Department of Education.

In the First and Second Years students will enrol in the Bachelor of Music programme common curriculum (q.v.); Second Year students are advised to take a class in a co-required second "teachable subject" as their elective. After successful application to the Department and to the School of Education (the application to be supported by the Chair of the Department), students will proceed to the three senior years of the programmes, choosing between Classroom Music and Instrumental Music, and the elementary or secondary school teaching option. The fifteen and one-half credits, Years III-V, are as follows:

Classroom Music

Third Year:

- MUS 31__R Applied Skills
- MUS 3351B History of Music VI
- MUS 3400R Elementary Methods
- MUS 3470C Elementary Field Experience
- MUS 3180A Conducting
- MUS 3471C Solfa Pedagogy in the Classroom
- MUS 3181B Choral Techniques
- Music or Music Education Elective: one-half credit

Fourth Year:

- MUS 41__R Applied Skills
- MUS 4400C Secondary Methods
- MUS 4470C Secondary Field Experience
- MUS 4482A Choral Arranging
- EDUC 4400R Psychology and Special Education

Elementary

FASS R Co-required class in English, History, Math or Science

Secondary

FASS R Co-required class in 2nd teachable subject

Fifth Year:

- EDUC 4900R Field Experience
- EDUC 4873C Studies in Education
- EDUC 1/2 Foundation Classes
- EDUC 1/2 Foundation Classes
- EDUC 1/2 Foundation Classes
- Elective 1/2 One-half class elective in Music, MusEd or FASS

Elementary

EDUC R Language Arts/Reading Methods

EDUC 1/2 Math Elective

EDUC 1/2 Methods Elective

Secondary

FASS R Co-required class in 2nd teachable subject

EDUC R Methods Class in 2nd teachable subject

Instrumental Music

Third Year:

- MUS 31__R Applied Skills
- MUS 3351B History of Music VI
- MUS 3400R Elementary Methods
- MUS 3470C Elementary Field Experience

- MUS 3160A Conducting
- MUS 3471C Solfia Pedagogy in the Classroom
- MUS 3282C Orchestration
- Music or Music Education: one-half credit

Fourth Year:

- MUS 41_R Applied Skills
- MUS 4400C Secondary Methods
- MUS 4470C Secondary Field Experience
- MUS 3480C Band Instruments
- or
- MUS 3481C String Instruments
- EDUC 4400R Psychology and Special Education
- Elementary**
- FASS R Co-required class in English, History, Math or Science
- Secondary**
- FASS R Co-required class in 2nd teachable subject

Fifth Year:

- EDUC 4900R Field Experience
- EDUC 4873C Studies in Education
- EDUC 1/2 Foundation Class
- EDUC 1/2 Foundation Class
- EDUC 1/2 Foundation Class
- MUS 4481C Band Methods and Field Experience
- or
- MUS 4483C String Methods and Field Experience
- Elementary**
- EDUC R Language Arts/Reading Methods
- EDUC 1/2 Math Elective
- EDUC 1/2 Methods Elective
- Secondary**
- FASS R Co-required class in 2nd teachable subject
- EDUC R Methods class in 2nd teachable subject

Co-requirements

Elementary: A student must complete a minimum of 3 full classes from English, History, Math, and Science. It is recommended that courses be selected from each area.

Secondary: A student must complete a minimum of 3 full classes above the 1000 level in a teachable subject. Teachable subjects are English, French, History, Math,

Biology, Chemistry, Physics, Economics, and Geography.

To assure all requirements are fulfilled, and to select electives where available in the programmes, students must consult with the Music Education Advisor and the School of Education BEd Programmer.

Standards

All students wishing to enter third year required Music classes other than MUS 3351B in either the BMusEd or BMusEd/BEd programme, must successfully complete their MUS 2000-level Applied Skill, MUS 2202B, MUS 2270C and MUS 2271C and achieve an overall average of B- in the music classes of the first and second years, including a minimum standing of C in each of MUS 1201A, MUS 1202B, MUS 2201A and MUS 2202B, and a minimum of B- in each of their MUS 2000-level Applied Skills, MUS 1270C and MUS 2270C. Students failing to demonstrate the required standard in MUS 2270C must repeat the class, but, with the permission of the Department, those with an otherwise satisfactory academic achievement may do so concurrently with their third year curriculum, within the five full classes or as an approved overload. In order to qualify for the award of a BMusEd or BMusEd/BEd degree, candidates must have obtained a minimum overall average of B in their music and music education classes above the 2000 level and maintain a minimum average of B in both their education and teachable subject Arts and Social Sciences or Science classes.

With special permission, a student in the BMusEd or BMusEd/BEd programme may give a graduation recital instead of a final jury exam.

Bachelor of Education in Music (BEd)

A student possessing an appropriate four-year undergraduate degree in Music from a recognized university may apply for a 6.5 credit B.Ed. programme in elementary and secondary music education, which leads to certification by the Nova Scotia Department of Education.

Applications must be received by the School of Education by **April 30**. Subsequently potential B.Ed. students in music education must complete their audition-interview with the Department of Music by **June 30**. The applicant must pass a written exam in theory, a keyboard proficiency test and an ear training exam (eight singing and dictation), the equivalent to the final examination standards of Second Year (Music 2202B, 2270C, 2271C). Failure to demonstrate satisfactory standards in any of these areas will require the student to enrol in the appropriate Second Year classes in addition to the six classes listed below.

The applicant also must demonstrate proficiency in his or her chosen performance idiom.

Successful applicants proceed to a curriculum which normally is as follows, noting that they may apply for transfer of credits in approved equivalent classes.

Music

- MUS 3400R Elementary Music Methods
- MUS 3470C Elementary Music Field Experience
- MUS 4400C Secondary Music Methods
- MUS 4470C Secondary Music Field Experience
- Elective in Music or Music Education (one half credit)

Education

- EDUC 4400RC (1.5 credits);
- EDUC 4873C (.5 Credit); and,
- Education Foundations (1.5 credits including a .5 class in each of Sociology, Philosophy, and History of Education)

Since the normal maximum number of classes that may be taken in any academic year is 15, students are advised to take the remaining credits in summer school prior to or following the actual year of study. Students are cautioned to consult the School of Education for the prospective availability of required education classes in summer school and to note the regular summer school tuition costs apply to those classes.

Standards

To complete successfully the programme of study, the candidate must obtain a minimum overall average of B in his/her music and music education classes above the 2000 level, and a minimum average of B in the Education classes.

Bachelor of Arts (Major in Music)

The BA (General) with a major in music is a three year programme, subject to the regulations described in the section Arts and Science: General Faculty Regulations (Item 3) and Degree Programmes (Item 5). Students are required to complete MUS 1350A, MUS 1351B, MUS 1201A and MUS 1202B, MUS 1270C, MUS 1271C and their MUS 1000 level Applied Skills before entering the third year. Other classes, to a maximum total of 6 full credit classes, may be selected in consultation with the Department to suit a student's individual needs and interests. Music Education classes are not considered applicable to this degree. Students in the BA (General) programme enrolled in Applied Skills classes are required to pass jury examinations.

Students wishing to transfer from another institution into this programme may be required to enrol in an Applied Skills Class at the First-Year level, depending upon the standard of their performance proficiency demonstrated in the audition-interview.

Academic Dismissal/Voluntary Withdrawl

Students required to apply for readmission to a university degree programme in Music must also submit to the department a supplementary readmission form. When a student in a Music degree programme has been dismissed on academic grounds and one of the classes failed is Applied Skills, that student must take a new audition upon application for readmission. When a student formerly registered in a music degree programme has been absent from the university for more than two years for reasons other than academic dismissal, it shall be within the discretion of the Music Department to require a new audition and/or validation tests before continuing in that programme.

Classes Offered

Classes Designed for Non-Majors

MUS 1000R Listening to Music: Designed for the interested listener who desires to acquire an informed response to musical experiences. A knowledge of musical notation and terminology is not a prerequisite except for Foundational Music students assigned to this class.

The class includes a survey of the evolution of music from primitive cultures to the modern age; music in contemporary society; music in non-Western civilizations; music and image; music and the related arts; the art and psychology of listening.

Instructor: W.H. Kemp
Format: Lecture 3 hours

MUS 2007R Guitar and Lute: For students with a serious interest in classical guitar and lute playing and for whom it is not possible to provide individual instruction. Basic playing technique and the history of fretted instruments.

Instructor: C. van Feggelen
Format: Lab 2 hours
Prerequisite: Personal interview with instructor

MUS 2008R Modern Guitar: A class for students with a serious interest in preparing for studio guitar playing and including jazz, folk, rock and accompanying idioms. Class instruction and ensemble playing in improvisation, score reading, chording and arranging.

Instructor: C. van Feggelen
Format: Lab 2 hours
Prerequisite: Interview with instructor

***MUS 2021R Music and Literature Since the Enlightenment:** An interdisciplinary class open to students not majoring in Music. There is no prerequisite. The discussion of music in this class assumes little or no musical background and literary works will be read in translation. About twelve major works (or smaller groups of works) will be considered. About half of these will focus on how different media can converge or digress on the same subject. Most of the remaining works will be large symphonic works which owe a clear debt to specific literary works or more general literary influences.

instructor: D. Schroeder
Format: Lecture 2 hours

The following classes, subsequently described, are also directed to non-majors:

MUS 1001A Materials of Music
MUS 1002B Introductory Music Theory
MUS 2087R, MUS 2287R Electronic and Experimental Music
***MUS 2011R, *MUS 3311R History of Opera**
***MUS 2012R, *MUS 3312R Music and Psychology**
***MUS 2013R, *MUS 3313R The Evolution of Jazz**
***MUS 3064B, *MUS 3364B Women in Canadian Music**

Classes Designed for Music Majors

N.B.: The following classes designed for music majors are available to non-majors with the permission of the instructor.

Studies in Music History and Literature

MUS 1350A History of Music I: A study of music in Western Civilization to 1800, including style, cultural contexts, and non-Western influences.

Instructor: staff
Format: Lecture 3 hours
Prerequisite: Permission of the instructor
Co-requisite: Normally, for Music majors, MUS 1201A, MUS 1270C, MUS 1271C

MUS 1351B History of Music II: A study of the history and literature of music in the Baroque period (c. 1600-1750) with an emphasis on the development of style and performance practices.

Instructor: staff
Format: Lecture 3 hours
Prerequisite: MUS 1350A
Co-requisite: Normally, for Music majors, MUS 1202B, MUS 1270C, MUS 1271C

MUS 2350A History of Music III: A detailed study of the history, literature and cultural contexts of music from C. 1750 to 1830.

Instructor: D. Schroeder
Format: Lecture 3 hours
Prerequisites: MUS 1202B, MUS 1350A, MUS 1351B

Co-requisite: Normally, for Music majors, MUS 2201A

MUS 2351B History of Music IV: A detailed study of the history, literature and cultural contexts of music from C. 1830 to 1950.

Instructor: D. Schroeder
Format: Lecture 3 hours
Prerequisites: MUS 2201A, MUS 2350A
Co-requisite: Normally, for Music majors, MUS 2202B

***MUS 3311R History of Opera:** An historical and analytical survey of operatic compositions from 1600 to the present day; opera as drama; changing tastes in operatic productions; operetta and musical comedy.

Instructor: Staff
Format: Lecture 3 hours
Prerequisite: Permission of the Department

***MUS 3312R Music and Psychology:** The interrelationship of music and psychology, as it relates to and informs the listener, student, educator and professional musician. Topics include a) the perception of tones as a foundation for the appreciation of musical experiences, music as passing time and as information; b) musical taste and aesthetics from a psychological point of view; c) the social psychology of music; d) theories of learning and of behaviour as appropriate to musical training and performance; e) the diagnostic and evaluative testing of musical aptitude and ability; f) the function of music in therapy and in special education. A rudimentary knowledge of musical notation is a prerequisite to this study; no previous classes in Psychology are necessary.

Instructor: W.H. Kemp
Format: Lecture 3 hours
Prerequisite: Permission of the Department

***MUS 3313R The Evolution of Jazz:** A survey of the historical and social background of jazz and its musicians. The evolution of jazz styles is illustrated in live performances as well as on recordings. A knowledge of musical notation is not a prerequisite to this class.

Instructor: D. Palmer
Format: Lecture 3 hours

MUS 3350A or B Music in the Middle Ages and Renaissance: A detailed study of the development of Western music in the Medieval and Renaissance periods with an emphasis on style, cultural contexts and performance practices.

Instructor: staff

Format: Lecture 3 hours
Prerequisites: MUS 1202B, MUS 1350A, or permission of the instructor

MUS 3351B Music Since 1950: A detailed study of the history, literature, cultural contexts and practices of music from C. 1950 to the present; the roots of the "new" music in earlier twentieth century composition.

Instructor: S. Tittle
Format: Lecture 3 hours
Prerequisite: Normally, for Music majors, MUS 2202B, MUS 2351B

***MUS 3352A Chamber Music, to 1800:** A study in depth of the history and repertoire of chamber music from the Renaissance to Classicism.

Instructor: Staff
Format: Lecture 3 Hours
Prerequisite: MUS 2202B, 2350A

***MUS 3353B Chamber Music, 19th and 20th Centuries:** A study in depth of the history and repertoire of chamber music of the Romantic and modern schools.

Instructor: Staff
Format: Lecture 3 Hours
Prerequisite: MUS 2202B, 2351B

***MUS 3354A Keyboard Music to 1750:** A study of the music stringed keyboard instruments by the English virginalists and Italian cembalists of the late 16th and early 17th centuries, the French clavichordists of the 17th and 18th centuries, and the music of D. Scarlatti, J.S. Bach and Handel.

Instructor: staff
Format: Lecture 3 Hours
Prerequisites: Permission of the Department

***MUS 3355B Piano Literature, 19th and 20th Centuries:** A study of the music for piano from the Viennese Classicists of the 18th century through to representative examples of the repertoire from the second half of the 20th century.

Instructor: staff
Format: Lecture 3 Hours
Prerequisites: Permission of the Department

MUS 3361A History of Dance: The class will explore the development of dance from the Basic dances of the Middle Ages, through the birth of ballet to the dances of today; It will include an introduction to dance notation as well as the practical and theoretical aspects of historical dance.

Instructor: P. Richards
Format: Lecture 2 hours

MUS 3362A Music in Canada to 1950: An historical survey of music in Canada to 1950: the socio-economic factors essential to the successful transplantation and growth of European musical culture in Canada; Indigenous Canadian music and nationalism in

Canadian composition; Canadian composers from the Colonial era to 1950; experience in Research skills through the preparation of a study paper on an historical or contemporary topic.

Instructor: W. H. Kemp
Format: Lecture 2 Hours; individual tutorial

Prerequisite: Permission of the Department

***MUS 3363B Music in Canada since 1950:** The development of musical life in Canada from the end of World War II until the present day; special emphasis on contemporary Canadian composers and an analytical study of their work.

Instructor: W. H. Kemp
Format: Lecture 2 Hrs; individual tutorial

Prerequisite: Permission of the Department

***MUS 3364B Women in Canadian Music:** An historical review of the contribution to the growth of music in Canada by women composers, performers, and educators; the life and works of major 20th Century Canadian women composers Violet Archer, Norma Beoroff, Jean Coulthard and Barbara Pentland; a survey of the younger generation of contemporary Canadian women composers.

Instructor: W. H. Kemp
Format: Lecture 2 Hours
Prerequisite: Permission of the Department

***MUS 3370C Performance Practice:** The principles of performance practice in 18th and 19th-century music will be discussed in the context of treatises, contemporary accounts, manuscripts and early editions. Areas to be covered include instruments, ornamentation, dance-related music, and problems of interpreting expression markings.

Instructor: D. Schroeder
Format: Seminar 2 hours
Prerequisites: MUS 1350A, MUS 1351B, MUS 2350A, MUS 2351B

MUS 4366A or B Topics in Music: This is an intensive study of selected topics announced annually.

Instructor: Staff
Format: Seminar 2-3 hours
Prerequisites: MUS 1350A, MUS 1351B, MUS 2350A, MUS 2351B

MUS 4367A or B Topics in Music History: This is an intensive study of selected topics announced annually.

Instructor: Staff
Format: Seminar 2-3 hours
Prerequisites: Mus 1350A, MUS 1351B, MUS 2350A, MUS 2351B.

MUS 4368A or B Special Studies: Individually directed research and writing under the supervision of an appropriate member of the Department.

Instructor: Staff

Prerequisites: MUS 2350A, MUS 2351B, MUS 3350A and MUS 3351B

MUS 4370C The Organ and Its Literature: The historical development of the organ, and the interrelationship between organ construction and repertoire from the Renaissance to the present day.
Instructor: D. MacDonald
Format: Lecture 3 Hours
Prerequisite: Permission of the Department

MUS 4399C Area Graduation Requirement (Thesis)

Theory and Related Skills

MUS 0070C Foundational Aural Perception: Designed for students with no experience in sight-singing or dictation, or for students needing extra and intensive exposure to these skills; may not be taken without co-related classes MUS 0071C, MUS 1001A, and MUS 1002B. Includes scales, modes, two-part (duet) reading, elementary dictation. A non-credit class.

Instructor: T. Zonneveld
Format: Lab 2 hours

MUS 0071C Foundational Keyboard Skills: Designed for students with no experience in using the keyboard as a proficiency tool. Includes work in basic harmonization, cadences, introductory improvisation, scale building. Not a class in piano lessons or piano repertoire. May not be taken without MUS 1001A, MUS 1002B, and MUS 0070C. A non-credit class.

Instructor: R. Byham
Format: Lab 2 hours

MUS 1001A Materials of Music: An introduction to University music studies for prospective music majors recommended by audition to foundational level classes in music; also open to non-majors. A knowledge of music reading and rudiments is presumed. Extensive work in rudiments applied to all aspects of music learning; the phenomenon of the tonic-melodic, harmonic and formal; modes, pentatonic scale formation, dissonances, 2-part writing to encompass these; non-tonal formations; acoustics. **Note:** auditioned students will be advised to take a year of private studies if their preparedness falls below the introductory level.

Instructor: T. Zonneveld
Format: Lecture 2 hours

MUS 1002B Introductory Music Theory: Also open to non-majors. Rhythm and phrase structures, "musica fiata" and elementary modulation in two- and three-part writing. Comparison of tonality, atonality, modality, and chromatic tonality, exploration of chord building triadic and otherwise, simple (bar) chording; elementary diatonic harmony previewing the start of MUS 1201A;

four-part writing as an immediate transition to MUS 1202B.

Instructor: T. Zonneveld
Format: Lecture 2 hours
Prerequisite: MUS 1001A

MUS 1201A Music Theory I: A survey of musical phenomena in general, subsequently of tonal music in particular. The material in this survey is immediately applied to two- and three-part writing, stressing both the harmonic and the contrapuntal dimensions.

Instructor: S. Tittle
Format: Lecture 3 hours
Prerequisites: Permission of the Department, plus Royal Conservatory of Toronto Grade II Theory equivalent or MUS 1001A/MUS 1002B

Co-requisites: MUS 1270C, MUS 1271C

MUS 1211B Music Theory II: A concentration upon a complete grounding in the traditional four-part writing skills, culminating in the study of the dominant seventh and elementary modulation.

Instructor: S. Tittle
Format: Lecture 3 hours
Prerequisites: MUS 1201A or permission of the Department

Co-requisites: MUS 1270C, MUS 1271C

MUS 1270C Aural Perception I: A class designed to correlate with MUS 1201A and MUS 1202B. Melodic, harmonic, rhythmic, textural and stylistic factors are visualized, performed and dictated systematically. Lab work in ear-training and sight-singing is done three times per week. Each student is a member of a small working section.

Instructor: T. Zonneveld
Format: Lab 3 hours
Prerequisite: Permission of the Department; MUS 0070C or equivalent

Co-requisites: MUS 1201A & MUS 1202B, MUS 1271C

MUS 1271C Keyboard Skills I: The development of basic skills in sight reading, score reading and harmonized accompaniment at the keyboard.

Instructor: R. Byham
Format: Lab 2 hours
Prerequisite: Permission of Department; MUS 0071C or equivalent

MUS 2201A Music Theory III: A continuation of Theory II, covering the study of altered chords, modulation to all closely related keys, and the relationship of harmony to melody, phrasing, rhythm, meter and performance issues. Emphasis is placed on concepts of functional tonality by means of written exercises in four-part harmony and analysis of 18th and 19th century music.

Instructor: D. Schroeder
Format: Lecture 3 hours

Prerequisites: MUS 1202B, MUS 1270C, MUS 1271C

Co-requisites: MUS 2270C, MUS 2271C

MUS 2202B Music Theory IV: The study of chromatic harmony and complex modulation.

Exercises may include some texture other than four-part choral style, and analysis includes forms such as binary, ternary, sonata, rondo and variation.

Instructor: D. Schroeder
Format: Lecture 3 hours

Prerequisites: MUS 2201A

Co-requisites: MUS 2270C, MUS 2271C

MUS 2270C Aural Perception II: This class provides further practice in melodic and harmonic dictation and sight-singing; it correlates with MUS 2201A and 2202B. A special component deals with solmization skills in sight reading.

Instructor: D. Farrell

Format: Lab 2 hours

Prerequisites: MUS 1201A & MUS 1202B, MUS 1270C, MUS 1271C

Co-requisites: MUS 2201A, MUS 2202B, MUS 2271C

MUS 2271C Keyboard Skills II: A continuation of MUS 1271C.

Instructor: R. Byham

Format: Lab 2 hours

Prerequisites: MUS 1201A & MUS 1202B, MUS 1270C, MUS 1271C

Co-requisites: MUS 2201A, MUS 2202B, MUS 2270C

***MUS 3270C Aural Perception III:** Advanced sight-singing and dictation. Singing music of all periods on solfe syllables and letter names with emphasis on contemporary music.

Dictation of modulating excerpts in four-part chorales. Chromaticism, modality, whole-tone and contemporary music are studied along with musical examples of more rhythmic complexity. Also included: singing and dictation of atonal compositions, advanced chords, sing and play exercises.

Instructor: P. Perron

Format: Lab 2 hours

Prerequisites: MUS 2202B, MUS 2270C, MUS 2271C

MUS 3280C Counterpoint: The development of skills in polyphonic architecture in two- and three-voice 16th century contrapuntal style using canonic techniques. An introduction to 18th century counterpoint: Inventiones, canons, and fugal expositions, etc.

Instructor: D. Farrell

Format: Lecture 2 hours

Prerequisites: MUS 2202B

MUS 3281C Form and Analysis I: Analytic study of the form and context of selected late eighteenth and nineteenth century compositions in various styles and idioms.

Instructor: Staff

Format:

Lecture 2 hours

Prerequisites: MUS 2202B, 2350A, 2351B

MUS 3282C Orchestration: A survey of the development of the orchestra and the orchestral instruments with an introduction to acoustics. Technique in the deployment of instrumental combinations is emphasized through practical exercises in scoring for a medium-sized orchestra common in the 20th century.

Instructor: S. Tittle

Format: Lecture 2 hours

Prerequisites: MUS 2202B

MUS 4280C Advanced Harmony and Counterpoint: The application of acquired harmonic and contrapuntal technique to various instrumental and vocal textures and forms; chorale prelude and fugue.

Instructor: W. Kemp

Format: Lecture 2 hours

Prerequisites: MUS 2202B, MUS 3280C and 3281C

MUS 4281C Form and Analysis II: Analytic study of the form and content of selected twentieth century compositions in various styles and idioms.

Instructor: W. Kemp

Format: Lecture 2 hours

Prerequisites: MUS 2202B, MUS 2350A, MUS 2351B, MUS 3280C and 3281C

Composition

MUS 2287R Electronic and Experimental Music: Introduction to the experimental Sound Studio. Recording, mixing, and tape manipulation techniques; analysis and composition of tape music; voltage control concepts, synthesizer theory and practice. Composition and live performance with electronics; group improvisation with both studio and personal resources. Design and execution of live performance situations which may include verbal, visual and other theatrical elements.

Instructor: S. Tittle

Format: Lab 3 hours

Prerequisites: Interview with instructor

MUS 3210R, MUS 4210R Composition I, II: Particular works are analyzed to serve as a springboard for original composition by the student. Students' works are evaluated in small group discussions and in individual tutorial sessions.

Instructor: S. Tittle, D. Farrell

Prerequisites: Permission of the Department, an interview with the instructor, and the submission of a folio of original

compositions for assessment by the composition faculty.

MUS 4271C Basso Continuo, Service Playing and Accompaniment: This class is designed to teach elementary principles of basso continuo and realization of figured bass as well as the practical study of the role of the organ in worship. Students will gain experience in continuo playing through ensemble participation. Topics for study in service playing include solo and anthem accompaniment, hymn playing, and examination of various forms of service music.

Instructor: D. MacDonald
Format: Lab 2 hours
Prerequisite: Departmental consent and an interview with the instructor

MUS 4282A Choral Arranging: See MUS 4482A, Music Education.

Instructor: D. Farrell
Format: Lecture 2 hours

MUS 4299C Area Graduation Requirement (Composition)

Performance

Note: The various levels of applied study indicate the year of study in the Department and are not intended solely as an indication of relative standard. Term gradings are based upon progress as well as upon the actual performing standard displayed in the jury examination.

Classes offered in all band and orchestral instruments, guitar and lute, piano, organ, harpsichord, recorder, voice. Normally all students receive a one hour weekly individual lesson in their major performance idiom. In addition to the one-hour lesson, and appropriate to the idiom, group instruction in technique and repertoire may be a required part of all sequences of Applied Skills classes.

Applied Skills classes are designated as follows:

MUS 1101R, MUS 2101R, MUS 3101R,
 MUS 4101R: Voice I, II, III, IV
 MUS 1102R, MUS 2102R, MUS 3102R,
 MUS 4102R: Guitar I, II, III, IV
 MUS 1103R, MUS 2103R, MUS 3103R,
 MUS 4103R: Piano I, II, III, IV
 MUS 1104R, MUS 2104R, MUS 3104R,
 MUS 4104R: Organ I, II, III, IV
 MUS 1105R, MUS 2105R, MUS 3105R,
 MUS 4105R: Violin I, II, III, IV
 MUS 1106R, MUS 2106R, MUS 3106R,
 MUS 4106R: Viola I, II, III, IV
 MUS 1107R, MUS 2107R, MUS 3107R,
 MUS 4107R: Cello I, II, III, IV
 MUS 1108R, MUS 2108R, MUS 3108R,
 MUS 4108R: Double Bass I, II, III, IV

MUS 1109R, MUS 2109R, MUS 3109R,
 MUS 4109R: Flute I, II, III, IV
 MUS 1110R, MUS 2110R, MUS 3110R,
 MUS 4110R: Oboe I, II, III, IV
 MUS 1111R, MUS 2111R, MUS 3111R,
 MUS 4111R: Clarinet I, II, III, IV
 MUS 1112R, MUS 2112R, MUS 3112R,
 MUS 4112R: Bassoon I, II, III, IV
 MUS 1113R, MUS 2113R, MUS 3113R,
 MUS 4113R: Saxophone I, II, III, IV
 MUS 1114R, MUS 2114R, MUS 3114R,
 MUS 4114R: French Horn I, II, III, IV
 MUS 1115R, MUS 2115R, MUS 3115R,
 MUS 4115R: Trumpet I, II, III, IV
 MUS 1116R, MUS 2116R, MUS 3116R,
 MUS 4116R: Trombone I, II, III, IV
 MUS 1117R, MUS 2117R, MUS 3117R,
 MUS 4117R: Tuba I, II, III, IV
 MUS 1118R, MUS 2118R, MUS 3118R,
 MUS 4118R: Percussion I, II, III, IV
 MUS 1119R, MUS 2119R, MUS 3119R,
 MUS 4119R: Lute I, II, III, IV
 MUS 1120R, MUS 2120R, MUS 3120R,
 MUS 4120R: Harpsichord I, II, III, IV
 MUS 1121R, MUS 2121R, MUS 3121R,
 MUS 4121R: Recorder I, II, III, IV

MUS 4150R Advanced Applied Skill: By special permission of the Department a student may enrol in a fifth year of an applied skill, subject to enrolment quotas and budget.

MUS 0100R Foundational Applied Skills: By special recommendation some music majors may be advised by the Auditioning Committee to begin individual lessons at a level prerequisite to 1000-level Applied Skills classes.

MUS 3160A Conducting:

Instructor: P. Djokic
Format: Lab 2 hours
Prerequisites: MUS 2202B, MUS 2270C,
 MUS 2271C

MUS 3161B Choral Techniques: Study of the distinctive features of conducting choral ensembles with emphasis on rehearsal technique, score preparation, interpretation and group methods of building vocal tone. Practical experience in conducting.

Instructor: W.H. Kemp
Format: Lab 2 hours
Prerequisites: MUS 2202B, MUS 2270C,
 MUS 2271C, MUS 3160A

MUS 4198C Church Music Internship: This class is reserved for students in the Fourth Year of the BMus Organ and Church Music Programme. Under the guidance of the liturgical and musical staff of the Atlantic School of Theology, students will prepare and perform Services pertaining to the principal church denominations. In the second term, students will be assigned to a minimum of three representative city churches, for observation and practice of the Service,

supervised by the Department in collaboration with the city church musicians and clergy participating in the programme.

Instructor: D. MacDonald, Staff Coordinator

Prerequisite: Permission of the Department

MUS 3199A or C Recital: Required of all third year Bachelor of Music students whose concentration is in Performance.

MUS 4199A or C Area Graduation Requirement (Recital)

Unconcentrated BMUS

MUS 4599C Graduation Requirement, Unconcentrated: Students in the Unconcentrated B.Mus. Program must receive Departmental approval to fulfil their graduation requirements with one of the following: (1) a single-topic thesis (2) two essays (on different topics) (3) a half recital and an essay (4) a lecture-recital (with supporting documentation).

Instructor: Staff

Music Education

Prerequisites for all classes: permission of the Department, and an interview with the designated member of the Music Education faculty.

Core Classes

MUS 3400R Elementary Classroom Teaching Methods: An introduction to the development of a music programme at the elementary level. Emphasis is on how to teach song materials, movement and creativity, reading and writing skills and what to listen for in music. The educational philosophies of Kodaly and Orff are examined in some detail. Solmization, hand signs, rhythm names and body co-ordination are some of the skills to be developed.

Instructor: P. Perron
 Format: Lecture 3 hours
 Cross-listing: EDUC 4881

MUS 3470C Elementary Classroom Field Experience: Students must spend a minimum of 100 hours in various elementary schools during the school year practice teaching (75%) and observing master teachers (25%). This consists of one morning per week during the university year and a three week period in April-May.

Instructor: P. Perron

MUS 3471C Solfa Pedagogy in the Classroom: An in-depth study of the theoretical and practical aspects of solfa and related ear training skills pertaining to students taking music education. The melodic, rhythmic and harmonic features of aural perception will be studied through sight-singing and dictation emphasizing the

pedagogical aspects of the moveable do system, hand-sign singing, singing on absolute letter names, and the use of rhythm names and stick notation.

Instructor: P. Perron
 Format: Lab 2 hours
 Prerequisite: MUS 2270C
 Co-requisite: MUS 3400R and/or MUS 4400C

MUS 3480C Band Instruments: A practical introduction to the principal band instruments. Group instruction is offered in flute, oboe or bassoon, saxophone, trumpet or French horn, trombone and tuba, and percussion. This class normally is restricted to students majoring in wind, brass or percussion instruments.

Instructor: J. Stern, Staff Coordinator
 Format: Lab 2 hours

MUS 3481C String Instruments: A practical introduction in group lessons to the instruments of the string orchestra. This class normally is restricted to students majoring in a string instrument.

Instructor: N. Babineau, Staff Coordinator
 Format: Lab 2 hours

MUS 4400C Secondary Classroom Teaching Methods: An introduction to the development of a music programme at the secondary level. Emphasis is on how to teach a general music class exploring the use of song materials, music theory, movement and creativity and listening skills.

Instructor: P. Perron
 Format: Lecture 1 1/2 hours
 Cross-listing: EDUC 4880

MUS 4470C Secondary Classroom Field Experience: Students must spend a minimum of 100 hours in various secondary school classrooms during the school year practice teaching (75%) and observing master teachers (25%). This consists of one morning per week during the university year and a three week period in April-May.

Instructor: P. Perron

***MUS 4480C Band Instruments II: A continuation of MUS 3480C.**

Instructor: J. Stern, Staff Coordinator
 Format: Lab 2 hours

MUS 4481C Band Methods and Field Experience: A survey of the literature for band, band methods for schools and purchase and maintenance of band instruments; supervised band leadership practice in the school setting.

Instructor: T. Hill
 Format: Lab 2 hours
 Prerequisite: MUS 3480A

MUS 4483C String Methods and Field Experience: A survey of literature and string methods for schools and purchase and

maintenance of string instruments; supervised string teaching practice in the school setting.

Instructor: N. Babineau
Format: Lab 2 hours
Prerequisites: MUS 3481C or permission

Electives

***MUS 4490A or B Orff Method and Practice, Level One, Basic:** An Introduction to Carl Orff's Music for Children designed for the elementary school classroom teacher and music specialist; the material is also suitable for those using music in the pre-school, recreational or studio setting. Emphasis is on how to apply the four principal elements of the Orff approach - speech, movement, rhythm and melody - to the teaching of basic musical concepts (beat, rhythm, simple metre, pentatonic scale, fundamental Bourdon, phrasing, form and notation). Creative procedures and teaching methods are explored using song, Orff instruments and the recorder.

Instructor: Staff
Format: Lecture and Practicum
Prerequisite: Permission of the Department

***MUS 4491A or B Orff Method and Practice Level Two, Intermediate:** A continuation of MUS 4490A or B at the intermediate level. Emphasis is on the acquisition and practice of procedures and methods of the Orff approach using increasingly developed musical materials and constructs (complete scale repertoire, melodic formulation, harmonic relationships and chordal formations, prose-rhythms and irregular metres, rondo and antiphony). Advanced training is given in instrumental technique (recorder, hand drum, mallets, etc.). The Orff approach is applied to ways of musically interpreting and improvising children's speech, recitation, poetry, and drama.

Instructor: Staff
Format: Lecture and Practicum
Prerequisite: MUS 4490A or B or a similar class in Basic Orff; an interview with the Department.

MUS 4462A Guitar in the Classroom: Introductory guitar instruction including vocal/choral accompanying methods and techniques for the school classroom setting, tablature reading and finger-style playing, development of skills in a variety of accompaniment and rhythmic figurations. Practical applications will be available in MUS 3470C/4470C.

Instructor: C. van Feggelen
Format: Lab 2 hours

MUS 4471A, B, or C Field Projects: Under supervision, students design a project that results in an in-depth study of the theoretical and practical aspects of a particular area of

music education. The project entails library research as well as working with specialists in the field.

MUS 4482A Choral Arranging: Arranging for the school choral ensemble.

Instructor: D. Farrell
Format: Lecture 2 hours
Prerequisite: MUS 3282C

Ensembles

Participation in both large and small ensembles is required of all students whose major field of study is music in each of the years of the degree programmes. Details of specific participation requirements are available in the Department of Music.

Membership in the various ensembles is open to the University and the community by audition.

Following is a list of the ensembles sponsored by the Department of Music:

MUS Dalhousie Chorale (W.H. Kemp): I. 0151, II. 0251, III. 0351, IV. 0451, V. 0551, Found. 0051.

MUS Dalhousie Chamber Choir (W.H. Kemp): I. 0152, II. 0252, III. 0352, IV. 0452, V. 0552, Found. 0052.

MUS Dalhousie Community Concert Band (Staff): I. 0153, II. 0253, III. 0353, IV. 0453, V. 0553, Found. 0053.

MUS Dalhousie Chamber Orchestra (P. Djokic): I. 0154, II. 0254, III. 0354, IV. 0454, V. 0554, Found. 0054

MUS Dalhousie Jazz Band (D. Palmer): I. 0155, II. 0255, III. 0355, IV. 0455, V. 0555, Found. 0055.

MUS Dalhousie Brass Ensemble (Staff): I. 0156, II. 0256, III. 0356, IV. 0456, V. 0556, Found. 0056.

MUS Dalhousie Musica Antiqua (D. Wilson): I. 0157, II. 0257, III. 0357, IV. 0457, V. 0557, Found. 0057.

MUS Dalhousie Percussion Ensemble (J. Faraday): I. 0158, II. 0258, III. 0358, IV. 0458, V. 0558, Found. 0058.

MUS Dalhousie Opera Workshop (J. Morris): I. 0159, II. 0259, III. 0359, IV. 0459, V. 0559, Found. 0059.

MUS Guitar Ensemble (C. van Feggelen): I. 0160, II. 0260, III. 0360, IV. 0460, V. 0560, Found. 0060

MUS Small Ensembles (staff coaches): I. 0161, II. 0261, III. 0361, IV. 0461, V. 0561, Found. 0061.

MUS Accompanying: I. 0162, II. 0262, III. 0362, IV. 0462, V. 0562, Found. 0062.

MUS Chebucto Orchestra (by invitation, and Department permission): I. 0163, II. 0263, III. 0363, IV. 0463, V. 0563, Found. 0063.

MUS Nova Scotia Youth Orchestra (by invitation, and Department permission): I. 0164, II. 0264, III. 0364, IV. 0464, V. 0564, Found. 0064.

MUS Scotia Wind Ensemble (by invitation, and Department permission): I. 0165, II. 0265, III. 0365, IV. 0465, V. 0565, Found. 0065.

MUS New Music Ensemble (S. Title): I. 0166, II. 0266, III. 0366, IV. 0466, V. 0566, Found. 0066

Neuroscience

Location: Psychology Department, Life Sciences Centre
 Telephone: (902) 494-3417
 FAX: (902) 494-8585

Programme Advisors

I.A. Meinertzhagen (494-2131)
 S.R. Shaw (494-2047)

Introduction

The last two decades have witnessed the remarkable emergence of a new, interdisciplinary field called Neuroscience which has as its primary goal the understanding of the brain. Neuroscience is a rapidly developing research area which includes all aspects of the structure and function of nervous systems. Neuroscience involves a variety of experimental strategies to understand nervous systems. These include molecular, biochemical, behavioural, anatomical, physiological, and developmental approaches. Although firmly grounded in the natural sciences, the scope of Neuroscience also encompasses fundamentally important philosophical issues, such as the nature of human thought and its mechanism. The programme outlined below represents all of these approaches, with an emphasis on behaviour as the adaptive product of neural activity. Knowledge obtained from research in Neuroscience is applied to a variety of human health problems, including neurological conditions such as those occurring in Alzheimer's disease, Parkinsonism, and a variety of drug- or injury-induced behavioural disorders. Research in Neuroscience is also contributing new information related to the major psychiatric disorders, including affective disorders and the schizophrenias.

The BSc (Honours) Programme

This programme is intended to serve as a preparation for graduate work in neuroscience, biological psychology, medicine, human communication disorders and related fields. Its interdisciplinary nature is reflected in the participation of faculty from several departments in the programme, which is offered through the Department of Psychology. Students interested in the Neuroscience degree programme should consult with either I.A. Meinertzhagen or S.R. Shaw in the Department of Psychology early in their undergraduate careers, preferably by the end of their first year of study. Admission is often deferred until the end of the second year, however.

Structure

In the first year of study, students are required to take classes which provide a firm grounding in the physical and biological sciences. In subsequent years, the programme includes 9 credits in classes drawn from Neuroscience, Psychology and Biology. These include a number of required core classes which emphasize the acquisition and application of laboratory skills. Note that students intending to obtain an Honours degree in Neuroscience may not use Psychology as their minor subject, nor may Psychology Honours students use Neuroscience as a minor subject. It is anticipated, but not required, that Neuroscience Honours students will have Biology as their minor subject. In that case, classes cross-listed with classes in Biology cannot count for credit towards both the Neuroscience programme and the Biology minor.

Students wishing to take Combined Honours in Neuroscience and a second discipline, e.g. Biology, Biochemistry, should consult with a programme advisor. In general, the required classes of the honours programme in Neuroscience will be required of all such students, except Psychology 2000 A. Thus, the minimum programme after year I is NEUR 2071A, NEUR 2072B, one full credit in Biology (BIOL 2020A or B and an extra half credit), NEUR 3370A, 3371B, 3440B, one of the listed Neuroscience seminar classes (half credit), and (for those students who take Neuroscience as a major subject of a combined honours programme) NEUR 4500R (honours thesis).

Curriculum

Year I: Students entering the Neuroscience Honours programme in their second year will normally have had the following classes in their first year of study:

- Biology 1000R (lab): Principles of General Biology
- Chemistry 1010R: General Chemistry, or 1030R: Principles of Chemistry
- Mathematics 1000A or B and 1010A or B, or 1500R: Calculus
- Writing class

In addition, the following classes are recommended during the first two years of study: Psychology 1000R or 1010R or 1500R: Introduction to Psychology; and Physics 1100R or 1300R: Introduction to Physics.

Year II Required Classes:

Neuroscience 2071A: Introduction to Neuroscience
 Neuroscience 2072B: Cellular Neurobiology
 Psychology 2000A (lab): Research Methods

Biology 2020A or B: Cell Biology

An additional one-half credit in Biology chosen from one of the three following: a) Biochemistry 2200B; b) Biology 2030A or B; or c) one of Biology 2001A, 2002B, or 2101B.

Options: One additional credit from among the following:

- Neuroscience 2140A or B: Learning
 - Neuroscience 2150A or B: Perceptual Processes
 - Psychology 2160A or B: Animal Behaviour
 - Neuroscience 2170A or B: Hormones and Behaviour
 - Neuroscience 2180A or B: Language and the Brain
 - Neuroscience 2270A or B: Human Neuropsychology
 - Neuroscience 2370A or B Drugs and Behaviour
- One and one-half credits in elective classes

Year III Required Classes:

- Neuroscience 3370A (lab): Neuroscience Laboratory I
- Neuroscience 3371B (lab): Neuroscience Laboratory II
- Neuroscience 3440B (lab): Neuroanatomy

Recommended: It is recommended that students take Psychology 3500 (Statistical Methods) in either their third or fourth year of study.

Options: One and one-half credits from among the following:

- Neuroscience 3000R (lab): Independent Research
 - Psychology 3040R (lab): Learning and Motivation
 - Neuroscience 3050R (lab): Perception
 - Neuroscience 3070R (lab): Physiological Psychology
 - Neuroscience 3071 R: Physiological Psychology
 - Neuroscience 3150A or B: Introduction to Hearing and Speech Mechanisms
 - Neuroscience 3180R (lab): Ethology
 - Neuroscience 3260A or B: Biological Rhythms
 - Neuroscience 3270A or B: Developmental Neuroscience
 - Psychology 3500R: Statistical Methods
 - Neuroscience 3590A or B: Perceptual Development
 - Neuroscience 3780A or B: Neuroethology
- Two credits in elective classes

Year IV Required Classes:

- Neuroscience 4500R: Honours Thesis

Options: One credit in fourth year seminars from among:

- Neuroscience 4000A or B: Senior seminar (topic open)
- Neuroscience 4050A or B: Perception
- Neuroscience 4070A or B: Neuroscience

Psychology 4160A or B: Topics in Behavioural Biology

Neuroscience 4370: Introduction to Pharmacology

One credit in courses from the third and fourth year lists above
Two credits in electives

Notes:

1. In designing the first year of study, students should consider the requirements for a BSc degree as outlined in Section 1 of the Degree Requirements, page 99.
2. Biology 2020A (Cell Biology) and Biology 3440B (Neuroanatomy; same as Neuroscience 3440B) cannot be counted as credits toward completing a minor in Biology.
3. Students are encouraged to consider the following classes as electives. Courses marked with an asterisk are recommended electives in the first or second year of study: Biochemistry 4301B (Biochemical Communication); Biology 3012A or Biochemistry 3200A (Introduction to Biol. Chemistry); Biology 3013B/Biochemistry 3300B (Intermediary Metabolism); Biology 3014B/Biochemistry 3400B (Nucleic Acid Biochemistry and Molecular Biology); *Chemistry 2400R (Organic Chemistry); Philosophy 3480A or B (Mind and Brain); *Physics 1100R/1300R (Introductory Physics).

Classes Offered

NEUR 2071A Introduction to Neuroscience:

This class introduces a number of aspects of this field emphasizing analyses which are precise at the neuronal level. A general introduction is provided by the vertebrate visual system, concentrating upon the analysis of visual information in the mammalian visual cortex. This is followed by consideration of muscle spindles and other receptors of the motor nervous system; a brief treatment of the anatomy of the mammalian brain and a more detailed analysis of the cerebellum; the other major components of the motor pathways to the spinal cord; spinal reflexes and the integrative action of neurons.

Format: lecture 3 hrs

Instructor: I.A. Meinertzhagen

Prerequisites: Psychology 1000 or 1010 or 1500 or Biology 1000 and 2020 or consent of instructor.

core-listing: PSY 2071A

NEUR 2072B Cellular Neurobiology: Building on the knowledge of holistic aspects of brain function gained in Neuroscience 2071A, this class explores the neuronal basis of activity in all nervous systems. Starting with an analysis of the structure of neurons, the

function of nerve cells will be explored with respect to the ionic and molecular basis of resting potentials and of electrical activity in nerve cells; synaptic transmission; the release and postsynaptic action of synaptic transmitters; aspects of the neurochemistry of synaptic transmitters and of drug action; and glial cells. Cellular phenomena relevant to neurological dysfunction will be discussed.

Format: lecture 3 hrs
Instructor: S.R. Shaw
Prerequisites: Psychology/Neuroscience 2071 or consent of instructor
cross-listing: PSY 2072B

NEUR 2140A or B Learning: Traces the experimental study of learning from the turn-of-the-century research of Pavlov and Thorndike to the present. Development of the field of animal learning is described in terms of the ways in which particular conceptions of the learning process have guided experimentation, and have in turn been revised on the basis of the outcomes of that experimentation. Some important concepts discussed are: association, attention, biological constraints on learning, classical conditions, discrimination, expectancies, law of effect, learning-performance distinction, operant conditioning, S-S and S-R bonds, and stimulus control. The value of various approaches is discussed with respect to several goals: (1) providing general principles of learning; (2) understanding the behaviour of particular species; (3) direct application to human problems. Emphasis is on understanding why researchers in animal learning do what they are currently doing (given the goals and the historical context), rather than on learning a number of facts about animal learning.

Format: lecture 3 hours
Instructor: V. LoLordo
Prerequisite: Psychology 1000 or 1010 or 1500
Cross-listing: PSY 2140

NEUR 2150A or B Perceptual Processes: Perception deals with the way in which our senses provide us with information about our environment. This class focuses on the process by which sensory experiences are coded, how they are interpreted by the nervous system, and how experience modifies perception.

Format: lecture 3 hours
Instructor: J. McNulty
Prerequisite: Psychology 1000 or 1010 or 1500 or Biology 1000
cross-listing: PSY 2150

NEUR 2170A or B Hormones and Behaviour: An introduction to the endocrinological bases of mammalian social behaviour. Emphasis is on the mechanisms by which the hormones of the hypothalamus, pituitary gland, gonads

and adrenal gland control sexual, aggressive and maternal behaviour. Other topics covered are: hormone receptors in the brain; the menstrual cycle and human reproduction; puberty, sex differences in the brain; the pineal gland; neuro-transmitters; pheromones; crowding and social stress.

Format: lecture 3 hours
Instructor: R.E. Brown
Prerequisites: Psychology 1000 or 1010 or 1500 or BIOL 1000
cross-listing: PSY 2170

NEUR 2190A or B Language and the Brain: This class is an introduction to the study of languages that are considered as symbolic functions of the human brain. The main topics are the common properties and organizing principles of languages; the acquisition of languages by children; the brain structures involved in language and the effects of brain damage on language disorders.

Format: lecture 3 hours
Instructor: M. Yoon
Prerequisite: Psychology 1000 or 1010 or 1500
cross-listing: PSY 2190

NEUR 2270A or B Human Neuropsychology: This class explores not only normal but also abnormal brain function, as revealed by the consequences of trauma, disease, and surgical intervention. Aphasia, epilepsy, the role of certain brain chemicals in behaviour, cerebral asymmetry, localization of brain function are examples of topics covered.

Format: lecture 3 hours
Instructor: M. Ozier
Prerequisite: Psychology 1000 or 1010 or 1500
cross-listing: PSY 2270

NEUR 2370A or B Drugs and Behaviour: An introduction to behavioural psychopharmacology. The lectures involve basic anatomy, physiology and chemistry of the nervous system. Behavioural effects and underlying mechanisms of various psychoactive drugs will be discussed. Specific topics will cover alcohol, tobacco, amphetamines, cocaine, opiates, hallucinogens, tranquillizers and antipsychotic drugs.

Format: lecture 3 hours
Instructor: S. Nakajima
Prerequisite: Psychology 1000 or 1010 or 1500
cross-listing: PSY 2370

SCI 3000R Science Fundamentals: An interdisciplinary class that stresses the motivations, methodologies, and responsibilities of scientists, and provides extensive formal instruction in written and oral communication of scientific material. For details, see main calendar entry "Science,

interdisciplinary." The status of this class (elective, minor, or major credit) varies from department to department; check with your undergraduate advisor.

NEUR 3000R Independent Research in Modern Neuroscience: Primarily for students wishing further experience and understanding of neuroscience research. A student in the class chooses a member of staff who serves as an adviser throughout the academic year, and under whose supervision independent research is conducted.

Format: lab 4 hours
Instructor: Staff
Prerequisites: Psychology 2000A or Neuroscience 2071A and previous or concurrent enrolment in two other 3000-level classes; and the prior consent of the instructor
cross-listing: PSY 3000

NEUR 3050R Perception: This class considers the way in which information about the world is provided by the senses and how we use this information in our behaviour. The material falls into four sections. (1) The methodological and theoretical problems peculiar to the study of sensation and perception; (2) The transformation of physical stimulus energy into neural energy; (3) The physiological and psychophysical analysis of the sensory systems with particular emphasis on vision; and (4) The development of perception and its relation to the anatomical and physiological development of the sensory pathways. The experimental work has been selected for its importance in the theoretical understanding of perceptual processes and consists of a general introduction to the apparatus and methods used in perceptual research.

Format: lecture 3 hours, lab 2 hours
Instructor: D.E. Mitchell
Prerequisites: Psychology 2000A and 2150
cross-listing: PSY 3050
Enrolment: 40

NEUR 3070R Physiological Psychology: Physiological psychology is concerned with the biological explanation of psychological phenomena. Students should have a working knowledge of concepts and methods in experimental psychology. Emphasis is on psychological issues with the answers sought in physiological terms. Labs will involve stereotaxic surgery on the rat.

Format: lecture 2 hours, lab 3 hours
Instructor: S. Nakajima
Prerequisite: Psychology 2000A and permission of the instructor
cross-listing: PSY 3070
Enrolment: 9

NEUR 3071R Physiological Psychology: Students in this class attend the same

lectures as students in Psychology 3070, but submit term papers rather than participate in laboratory work. The class is designed for students who wish to learn about physiological aspects of psychological issues, but who do not require the laboratory experience.

Format: lecture 2 hours, conference 1 hour
Instructor: S. Nakajima
Prerequisite: Psychology 2000A
cross-listing: PSY 3071

NEUR 3150A or B Introduction to Hearing and Speech Mechanisms: Hearing and speech are two behavioural capacities of fundamental importance to normal human communication. This lecture class is designed to provide a basic understanding of the peripheral and central neural mechanisms of hearing, and of some psychological and physiological processes involved in speech production and speech perception. The class is intended for those students anticipating more advanced training in neural mechanisms of hearing, speech science, human communication disorders and/or audiology. The class emphasizes normal hearing and speech mechanisms, but will address pathology where evidence from pathological subjects is pertinent to understanding normal function. **Class content:** introductory acoustics; structure and function of the outer and middle ears; structure and function of the cochlea; hair cell physiology and sensory transduction; coding of simple and complex sounds in the auditory nerve; sound localization mechanisms as an example of the correspondence between the physical properties of the stimulus, neural sensitivity and behavioural performance; theories of speech production; theories of speech perception; acoustic and linguistic contributions to speech perception.

Format: lecture 3 hours
Instructor: D.P. Phillips
Prerequisites: Psychology 2150 or 3050; Neuroscience 2071A, 2072B strongly recommended
cross-listing: PSY 3150

NEUR 3160R Ethology: Ethology is the biological study of behaviour. It uses psychology, genetics, physiology, ecology and evolutionary theory to solve problems in the development, function and causation of behaviour across all animal species. These diverse approaches to the study of animal behaviour are presented in naturalistic and experimental situations. In laboratory exercises qualitative and quantitative records of behaviour are made in the field and in the laboratory. There are several group research projects (first term) and an individual research project (second term).

Format: lecture 2 hours, lab 2 hours

Instructor: J. Fentress
Prerequisites: Psychology 2160 or Biology 1000
cross-listing: PSY 3160
Enrolment: 40

***NEUR 3260A or B Biological Rhythms:** The temporal structure of animal and human physiology is governed by both homeostatic mechanisms and by a system of biological clocks. These internal clocks generate rhythms with various periods in virtually every physiological and behavioural system. Daily (circadian) clocks are the most prominent; they generate rhythms in sleep, reproduction, intellectual performance and many other functions. This class examines the nature of these biological clocks and their physiological substrates, with an emphasis on the neural mechanisms involved in rhythm generation and synchronization in a variety of species. It also explores the hypothesized role of circadian mechanisms in sleep disorders, jet lag and depression.

Format: lecture 3 hours
Instructor: B. Rusak
Prerequisites: Psychology 1000 or 1010 or 1500 or Biology 1000
cross-listing: PSY 3260

NEUR 3270A or B Developmental Neuroscience: This class introduces students who are already familiar with the structural organization and functional properties of the mature nervous system to aspects of neural development, especially at the cellular level. The first part of the class will link the early events of neural development to general embryonic development. Cell determination, pattern regulation, cell production, cell-lineage analysis, and neuronal differentiation, movement and migration will be discussed. Special attention will then be given to later developmental events such as neuronal growth cones, cell death, growth factors, neuron-neuron interactions and synapse formation using invertebrate and vertebrate examples.

Format: lecture 3 hrs
Instructor: M. Yoon
Prerequisites: Neuroscience 2071A and 2072B
cross-listing: PSY 3270

NEUR 3370A or B Neuroscience Laboratory I: The two classes 3370 and 3371 (see next entry) are coordinated and provide introduction to several techniques used in contemporary neuroscience. The following information applies to these classes as a pair, between which the exact distribution of experimental approaches may vary from year to year according to availability of equipment and material, and numbers enrolled. Usually, electrical recording methods from several types of preparation are emphasized in 3370,

while detailed neuroanatomically-based approaches are favoured in 3371. Regularly scheduled labs with students working in groups of 2 or 3 under supervision are supplemented by occasional lectures, in both classes. Students become familiar with electrical recording and stimulation methods and related techniques, currently using both sensory and motor system preparations. Neuroanatomical analysis is introduced by way of techniques usually selected from the following: Golgi impregnation of neurones, immunocytochemistry, dye-tracing of connections, and electronmicroscopy of the visual system or central nervous system. Lab II (3371) usually runs in the second term for selected, advanced students, building upon foundations laid in 3370 but using different practical approaches.

Format: lab 3 hours
Instructor: S.R. Shaw
Prerequisites: Neuroscience 2071A and 2072B, or 3270A, and consent of instructor
cross-listing: PSY 3370

Enrolment: 12

NEUR 3371A or B Neuroscience Laboratory II: For a description of this neuroscience lab class, see the entry under 3370 above; usually, 3371 is coordinated closely with 3370.

Format: lab 3 hours
Instructor: I.A. Mainerzhagen
Prerequisites: NEUR 3370 and instructor's consent
cross-listing: PSY 3371

Enrolment: 12

NEUR 3440A or B Neuroanatomy: A survey of the histology, development and organization of the central nervous systems, with emphasis on the developmental and structural relationships between spinal cord and brainstem. The organization of cranial nerves and microanatomy of the brain stem is discussed. The organization of sensory and motor systems is presented in detail. The cerebral cortex, cerebellum, basal ganglia, and limbic system are also covered.

Format: lecture or lab 3 hours
Instructor: D.A. Hopkins (Anatomy Dept.)
Prerequisites: BIOL 2020 and instructor's consent
cross-listing: ANAT 210B, PHYT 2000, BIOL 2440

NEUR 3590A or B Perceptual Development: This class examines the development of visual and auditory capacities in human infants and in a variety of animal species with sensory systems like our own. The neural events that underlie these developmental changes in the various sensory pathways will

be discussed. The class will also grapple with the old question of how early sensory experience influences our perceptual abilities.

Format: lecture 3 hours
instructor: D. Mitchell
Prerequisite: Psychology 2000A
cross-listing: PSY 3590

***NEUR 3780A or B Neuroethology:**
 Neuroethology is the study of the neural bases of animal behaviour. The class will emphasize cellular approaches toward understanding the integrative mechanisms of the nervous systems which underlie complex behaviours. Feature detectors, command systems and motor programme generators will be examined in depth using examples from vertebrate preparations. Cellular bases of higher order functions such as motivation, learning and choice will be explored if time permits.

Format: lecture 2 hours
instructor: Staff
Prerequisites: PSY 2000A or 2160 or NEUR 2071 or 2072 or BIOL 2020 or instructor's consent
cross-listing: PSY 3760

NEUR 4000A or B Senior Seminar:

Format: lecture 2 hours
instructor: Staff
cross-listing: PSY 4000

***NEUR 4080A or B Topics in Perception:**

This class explores the neural basis of perception, emphasizing the visual, tactile and auditory senses.

Format: lecture 2 hours
instructor: Staff
cross-listing: PSY 4060

NEUR 4070A or B Neuroscience Seminar:

Format: lecture 2 hours
instructor: Staff
Prerequisites: Psychology 2071 and 2072 and 3270 or consent of the Instructor.
cross-listing: PSY 4070

NEUR 4160A or B Topics In Behavioural

Biology:
Format: 2 hours
instructor: Staff
cross-listing: PSY 4160

NEUR 4371A Introduction to Pharmacology I:

This introductory class is designed to acquaint students with the actions of drugs on physiological and biochemical functions in mammals including man. The interaction of drugs with the central and peripheral nervous systems will be covered. Factors which affect the blood levels of drugs (absorption, distribution, metabolism and elimination) will be considered, together with the mechanisms by which drugs act and their potential uses.

Format: lecture 2 hours or 2 hours

Instructors: H.A. Robertson, J. Blay (Co-ordinator)
Prerequisite: permission of the co-ordinator
Enrolment: 35
Cross-listing: BIOL 4404A, BIOC 4804, PHAR 5406

NEUR 4372B Introduction to Pharmacology II:

This class is intended to cover specific aspects of drug action in greater depth than 4371A and to provide students with practical expertise in pharmacology. The laboratory component consists of prescribed exercises using varied techniques.

Format: lecture 3 hours, lab 3 hours
Instructors: H. Robertson, J. Blay (Co-ordinator)
Prerequisite: Permission of Co-ordinator
Enrolment: 20
Cross-listing: BIOL 4405B, BIOC 4405, PHAR 5407

NEUR 4500R Honours Thesis:

The purpose is to acquaint the student with a current problem and the related research procedures in experimental neuroscience. Each student works with a staff member who advises the student about research in the major area of interest and closely supervises an original research project carried out by the student. The students meet together occasionally throughout the year to describe their proposed research and their progress. Each student must submit a formal written report of the completed research. The final grade is based upon the originality and skill displayed in executing the project, with emphasis upon the submitted report and an oral presentation.

instructor: J.W. Clark and Staff
Prerequisite: Restricted to honours students in their graduating year
cross-listing: PSY 4500

School of Nursing

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Telephone: (902) 494-2535

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Director

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MS (McM), RN
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Norma J. Murphy, BN (Dal), MScN (UBC), RN
Florence Myrick, BN (Mem), MScN (Western),
RN
Gail Tomblin Murphy, BN, MN (Dal), RN

Lecturers

Mary Bender, DipOP&CHN (Dal), BSN (UVic),
RN
Keith Cookersell, DipOP&CHN (Dal), BPharm
(UBradford), RN
Ruth Martin-Misener, DipOP&CHN, BScN
(Dal), RN
Rosemarie A. Pogoda, CertCHN (Man), RN
Katharine Stares, Dip.OP&CHN, BN (Dal)
Adele R. Vukic, BN (Dal), RN
C. Faith Wight Moffatt, BN (MUN), MS
(Boston), RN

Senior Instructors - Skills Laboratory

Eloise Bethune, BScN (MSVU), RN
Barbara Bleasdale, BN (Dal), RN

Honourary Appointments

Margaret Jean McCormick, BN (Dal), MEd
(Acadia), PhD (Dal)
Hope Beanlands, BN (UNB), MN (Dal)
Janet Braunstein, BScN (Cornell), MPH (Minn)
Alan Donald, BSc (Simon Fraser), MSc
(Queens), PhD (Western)
Elizabeth Gibbs, MN (Dal), RN
Marlene Grantham, BScN, MSc (A), PHN
(Western), RN
Marilyn Johnson, BScN (Ottawa), RN
Janet Knox, BN (UNB), MN (Dal)
Ann Miller, RN, SCM (GB), MN (Cal)
Maureen Nowlan, BN (Dal), MScN
(Cincinnati), RN
Loulea Patterson, BN (UNB), MN (Dal)
Sheila Rose, BN (McG), MN (Dal)
Elaine Shuttleworth, BN (Winnipeg), MPA
(Winnipeg), RN
Catherine Turner, BN (Dal), MN (Dal), RN
Deborah Vandewater, BN, MN (Dal)
David Whitehorn, BSc (Mich), MScN (Yale),
PhD (Wash)
Heather Young, BN (Mem), MScN (Western)

Cross Appointments

Karen Mann, BScN (Dal), MSc (Dal), PhD
(Dal), Associate Dean, Faculty of Medicine
Jerome Singleton, BA (Waterloo), MS (Penn
State), PhD (Maryland)
- Associate Professor, School of Recreation,
Physical & Health Education

Preceptors

Many nurses, health-care professionals
and persons in other disciplines give of their
time and expertise to assist in the education
of the nursing students in all years of all
programmes. These valuable preceptors are
too numerous to list, but are a vital part of
the programme. Names can be obtained by
contacting the School of Nursing.

Introduction

The School of Nursing was organized in 1949. In 1961 the School of Nursing became a constituent part of the newly established Faculty of Health Professions. Currently the School offers an undergraduate programme for basic and Post RN students, a Masters of Nursing programme, a 15-month programme leading to a diploma in Outpost and Community Health Nursing, and a 4-month Northern Clinical Programme. The School has an international linkage project with the University of Dar es Salaam in Tanzania to assist with the development of the first baccalaureate nursing programme for that country and in the education of their nurse teachers.

School of Nursing Regulations

1. All students are required to observe the University Regulations and Academic Regulations as described in this calendar.
2. As an academic requirement, students are assessed in each year on their aptitude and fitness for the profession of Nursing. A student who, in the judgement of the faculty, fails to attain a satisfactory standard in this assessment may be required to withdraw from the School.
3. Students in the Baccalaureate Degree Programmes are responsible for (a) the purchase of uniforms including shoes and a watch with a sweep hand or a digital watch with seconds display, (b) cost of accommodation and travel while on a clinical experience in areas outside the Metro area including the summer clinical. Additional expenses are incurred by the student in the Basic Baccalaureate Degree Programmes for field experience, books, first aid course, CPR course, graduation pin, equipment, and nurse registration examinations. Each student must also purchase name tags and crests from the University.
4. In view of the restriction on the size of classes in the School of Nursing, any applicant who has been advised of provisional acceptance must pay a non-refundable tuition deposit of \$200 within three weeks of such notification.
5. Also because of enrollment limits on class size, all part-time students who wish to change their status to full-time must present this request in writing to the Associate Director of Undergraduate Programmes by March 1.
6. Adviser-Advisee System. Each student is assigned to a faculty member from the academic advising committee to help

them plan their academic programme, to approve class selection and to discuss academic progress or difficulties.

7. Students wishing to appeal a decision based on faculty regulations or decisions should follow the School Appeal Procedure.

School of Nursing Appeal Procedure

It is recognized that both students and faculty have rights and responsibilities and further, that as the University is a complex system, a student may experience difficulty in determining how to express dissatisfaction. This document is provided as a guideline for students and faculty in solving dissatisfactions.

Definitions

Appeal: A request for alteration of a decision which is based on School or Faculty regulations (academic matters).

The University has established a system which allows the student the opportunity to appeal an academic decision made by faculty. This appeal can be heard at three different levels within the University: (1) School, (2) Faculty, and (3) Senate. Appeals are heard in the School by the Committee on Studies, at the Faculty level by the Faculty Committee on Studies, and at the Senate level by the Senate Academic Appeals Committee.

Procedure for Undergraduate Appeals

Undergraduate appeals in the School will be heard by the Committee on Studies. Appeals may be made to the Committee on Studies on academic matters. Please see regulations in the Calendar and the Student Manual.

1.1 Waiver of a Regulation

If a student wishes to request a waiver of a regulation of the School, Faculty or University, as set out in the Calendar, the following procedure is suggested:

- (a) the student should discuss the request with the academic advisor.
- (b) the academic advisor will inform the student to direct the request in writing to the Committee on Studies, where a decision will be made.
- (c) if the student is not satisfied with the decision, it may be appealed to the Committee on Studies, Faculty of Health Professions.

- (d) in an appeal, the student should submit a summary of the appeal and the reason, in writing, to the Chair of the Committee on Studies, Faculty of Health Professions.

These appeals will be dealt with by the Committee on Studies at the next scheduled meeting.

1.2 Reassessment of a Grade for a Non-clinical Class

When a student desires that a grade be reassessed, the following procedure will be followed:

- (a) the student applies to the Registrar for a grade to be assessed. There is a fee for this appeal. The request must be made within two months of the date the grade is sent from the Registrar's Office.
- (b) the Registrar informs the Director of the School that such a request has been made.
- (c) the Director will forward the request to the Committee on Studies. When a paper or exam is to be reread, the Committee on Studies will appoint a reader. The reader will be a person knowledgeable in the subject area and is not directly involved with the student or the class.
- (d) the Committee on Studies is to receive the original marked copy. The Committee on Studies will provide the reader with an identical unmarked paper, a copy of the objectives, assignment and grading guide.
- (e) the reader will submit a grade to the Committee on Studies within ten days of receiving the examination or paper.
- (f) the student will receive a written copy of the reader's assessment of the term paper.
- (g) the Chair of the Committee on Studies will inform the student, the Director and the Associate Director.
- (h) the student may appeal such a reassessment to the Committee on Studies, Faculty of Health Professions.

NOTE: This procedure is followed after all normal professor(s)/student discussion (bargaining) regarding the grade.

1.3 Reassessment of a Grade for a Clinical Class

Students may seek a reassessment of a grade in a clinical class, if in their opinion an inaccurate assessment has been made in the

evaluation of their clinical performance. It is strongly recommended that informal discussion with faculty member(s) involved in the assignment of the clinical grade be pursued.

1.3.1 If the student is still dissatisfied with the assigned grade, then the formal review process is as follows:

- (a) The request for review shall be made by letter to the Registrar's Office accompanied by the required fee as quickly as possible but within a maximum of two months from the date the grade is sent from the Registrar's Office. The Registrar's Office shall forward the request for review to the Director of the School of Nursing.
- (b) A supporting letter to the above request, which describes the purpose(s) of the appeal, the situation surrounding it and the expectations of the student appealing the grade, will be sent to the Director of the School of Nursing by the student.

1.3.2 Upon notification of the request for review, the Director will: (a) refer the matter to the Committee on Studies (by forwarding a copy of the above letter and request), and (b) inform the faculty member(s) involved of the request for review.

1.3.3 The student is responsible for providing all necessary documentation for the appeal, including all written assignments and evaluations, to the Chair of the Committee on Studies within one week of beginning the process.

- (a) The faculty member(s) involved will review the documentation received to ensure that it is complete.

1.3.4 The faculty member(s) involved may also review the documentation and assigned grade and report any change to the Committee on Studies within three days.

1.3.5 The Committee on Studies will meet within ten days of the Director informing the Committee of the appeal.

1.3.6 The Committee shall elect three of its members as a review board. One of these members may be a student enrolled in the School of Nursing.

- (a) Faculty who have taught the student in the current academic year are not eligible for the review board.
- (b) In the event that it is impossible to strike a review board from the Committee on Studies membership, another faculty member(s) will be appointed by the Committee on Studies to be on the review board.

- (c) The review board will select its own Chair.
- (d) The review board must consider both due process and whether or not course objectives were met.

1.3.7 The student and the faculty member shall be given the opportunity to meet the review board or shall meet at the request of the members of the board.

- (a) The student has the right to review all documentation connected to the appeal.
- (b) Both parties shall have the opportunity of being present to hear each other's presentation.
- (c) All proceedings will be taped (for secretarial exactness) and tapes will be erased as soon as the appeal procedure has been resolved within the School of Nursing.

1.3.8 The members of the review board shall meet and decide on the final grade on the basis of the information given to them.

- (a) They shall report their decision to the Chair of the Committee on Studies within twenty-one days of their appointment.

1.3.9 The student and faculty member(s) shall be given a copy of the review board's recommendations by the Chair of the Committee on Studies.

1.3.10 The Chair of the Committee on Studies shall report the results of the decision to the Director.

1.3.11 If the student is still not satisfied with the grade, the next level of appeal is the Faculty Committee on Studies.

Bachelor of Science (Nursing) for Basic Students

1. Degree Requirements

A student must obtain a minimum cumulative GPA of 2.0 throughout the entire undergraduate programme. A student must accumulate a minimum of 123 credit hours and have successfully completed all compulsory classes, as well as the necessary number of elective classes. The degree must be completed within 6 years of commencing nursing classes, although credit will be given for classes that are up to ten years old by the date the degree is completed.

Grade Point Average Standards (GPA)

The grade point average system is described in the Academic Regulations. School regulations relating to GPA apply to students whose initial registration in the School was in the Fall of 1990 or earlier. Consult calendar of the appropriate year.

2. Requirements for Promotion

Besides meeting the GPA requirements students must meet the following requirements for promotion:

Year I to Year II: A student must pass all first year level classes in order to advance to second year nursing classes.

Year II to Year III: A student must pass all second year nursing classes, Microbiology 1100A and Math 1060A/B.

Year III to Year IV: A student must pass all third year nursing classes with the exception of NS210A/B.

3. Normal Workload

The programme consists of 123 credit hours (20.5 credits); these are divided to give the following yearly normal workload:

Year I: a normal workload is considered 30 credit hours (5 credits)

Year II: a normal workload is considered 36 credit hours (6 credits)

Year III: a normal workload is considered 28 credit hours (4.5 credits)

Year IV: a normal workload is considered 29 credit hours (5 credits).

Bachelor of Science (Nursing) for Registered Nurses

1. Degree Requirements

A student must obtain a minimum cumulative grade point average of 2.0 throughout the entire undergraduate programme. A student must accumulate a minimum of 77 credit hours and have successfully completed all compulsory classes, as well as the necessary number of elective classes. The degree must be completed within six years of commencing the nursing classes, although credit will be given for classes that are up to ten years old by the date the degree is completed.

2. Other Regulations

Students must submit proof of current registration as a nurse in Nova Scotia or their province or country of residence each year they are enrolled in nursing classes. All other regulations are as outlined in the BScN Basic stream in the University Calendar, including Immunization, Grades, and Supplemental Exams.

3. Normal Workload

The 77 credit hours of study may be completed over three academic years of full-time study with a normal yearly workload as follows: Year 1: 25 credit hours; Year 2: 26 credit hours; Year 3: 26 credit hours.

Bachelor of Science (Nursing) Degree Programmes

The challenges of the health care system have reached a technological and social level such that nurses have recognized the need for university level education in order to practice within that system. The purpose of baccalaureate nursing education is to prepare professional nurses to provide research-based care to clients in a variety of settings. Baccalaureate nursing encompasses the promotion of health, prevention of disease and intervention in health and illness problems. Nursing is an art and a science centering on nursing courses. It is complimented by required and support courses in biological sciences, social sciences and humanities. The four year basic degree programme is for students with no previous nursing knowledge and experience. Students who have a diploma in nursing (Post-RN students) are also admitted to the Bachelor of Science (Nursing) programme but have a shorter programme as described later.

Programme Objectives

The graduate of this baccalaureate programme will be prepared to:

1. Use scientific knowledge in the application of the nursing process when caring for clients in different stages of health and illness.
2. Use therapeutic communication in the development of a professional helping relationship with clients.
3. Use critical thinking in nursing.
4. Serve as an advocate to protect the rights, diversity and worth of clients.
5. Use the process and products of research to enhance clinical practice.
6. Collaborate with others in the delivery of health care.
7. Demonstrate leadership in nursing and within the health care delivery system.
8. Use knowledge of the process of change within the political, social and health care systems in the practice of nursing.
9. Assume responsibility and accountability for learning and competency in her/his nursing practice.

All undergraduate degree programmes are coordinated by the Associate Director of Undergraduate Programmes.

Bachelor of Science (Nursing) for Basic Students

The Bachelor of Science (Nursing) degree is a four year programme. Graduates are eligible to write examinations for membership in the Registered Nurses' Association of Nova Scotia.

Immunization

Before commencing studies in first year, students must show proof of current immunization against: tetanus, diphtheria, polio, measles and rubella.

Immunization against Hepatitis B is recommended for all students and is available through Dalhousie Health Services at a cost of \$62 (based on 1992-93 cost).

Evidence of tuberculin testing (mantoux) must also be shown each September. TB testing can be done by the Public Health Nurse or is offered yearly by Dalhousie Health Services. This information must be sent to the Admissions Coordinator, School of Nursing. Students failing to provide this evidence will be withdrawn from clinical areas.

CPR, (BCLS) & Basic First Aid Certification

All students must show proof of CPR and Basic First Aid certification before entering clinical in second year. This proof is to be sent to the Admissions Coordinator, School of Nursing. Taking a cardio-pulmonary resuscitation course and basic first-aid course are the student's responsibilities both in time and cost.

Course of Study

The following is an outline of classes that are normally taken each year and includes in brackets the credit hours assigned to each class.

First Year: Chemistry 1430R (6), Anatomy 0101C (3), Physiology 1010R (6), Psychology 1000R (6), Sociology 1000R (6), Nursing 1010C (3).

Second Year: Microbiology 1100A (3), Math 1060A or B (3), N2010A (2), N2020A (2), N2200A (3), N2030B (2), N2040A (2), N2210B (4), N2220B (6) and 9 credit hours of electives chosen from any Faculty. These electives are to be at the 2000 level or above. N2220B is a six week clinical nursing class usually starting toward the end of April.

Third Year: N3010A (2), N3020A (2), N3200A (3), N3210A or B (3), N3220A or B (4), N3030B (3), N3230B (5), N3240B (3), N3250B (3), Human Sexuality Workshop Part I (non-credit). N3240B and 3250B are clinical nursing classes of 3 weeks each that normally start towards the end of April.

Fourth Year: N4010B (3), N4020A (1), N4030A (3), N4200A (4), N4210A or B (3), N4220A or B (3), N4230B (4), one elective in nursing (3), and N4240B (5), Human Sexuality Workshop Part II (non-credit).

N4240B is a 5 week clinical class normally starting toward the latter part of the winter term.

Bachelor of Science (Nursing) for Registered Nurses

The Bachelor of Science (Nursing) for registered nurses consists of 77 credit hours of University study distributed as follows: required non-nursing classes, 33 credit hours; required nursing classes, 35 credit hours; electives, 9 credit hours. Students may complete the programme through either part-time or full-time study. The programme can be completed in two calendar years of full-time study provided resources allow required nursing classes to be offered during the summer session. Otherwise, students without transfer credits can complete the programme in two full-time and one part-time academic years (Sept. - April) of study. Part-time students who wish to change their status to full-time must write their request to the Associate Director of Undergraduate Programmes by March 1.

Course of Study

With the help of an academic advisor, each student is able to map out an individual course of study. An individual course of study may be affected by the actual classes given in an academic year as well as in which semester (Fall, Winter, Spring, Summer) they are given. Certain classes may have pre-requisites as noted in the class descriptions. Part-time students are encouraged to complete most of the required non-nursing classes before starting nursing classes. N2230A and N2010A are pre-requisites for all nursing classes. Non-clinical nursing required or elective classes may be taken concurrently with N2230A by special permission of the class professor. Anatomy and Physiology are normally pre-, or co-requisites for N2230A. The course of study varies considerably when the student applies accepted transfer credits toward the degree programme. Transfer credit regulations are as outlined under the Academic Regulations section of the University Calendar.

The required non-nursing classes are (credit hours in brackets): Anatomy 0101C (3), Physiology 1010R (6), Chemistry 1430R (6), Psychology 1000R (6), Sociology 1000R (6), Microbiology 1100A (3), Math 1060A or B (3). The nine credit hours of electives may be chosen from any Faculty and are to be at the 2000 level or above.

Required Nursing Classes

NURS 2010A Helping Relationships and Nursing (2)

NURS 2230A Advanced Concepts and Skills of Nursing Practice (4)
 NURS 3020A Teaching and Learning and Nursing (2)
 NURS 3030B Nursing Research (3)
 NURS 3220A or B Family Nursing (4)
 NURS 4010B Trends and Issues in Nursing (3)
 NURS 4020A or B Advanced Skills in Helping Relationships and Interviewing (1)
 NURS 4030A Leadership in Nursing Practice (3)
 NURS 4200A Community Health Nursing: Theory and Practice I (4)
 NURS 4230B Community Health Nursing: Theory and Practice II (4)
 Human Sexuality Workshop
 Nursing Electives (5)

The 5 credit hours of nursing electives are chosen from:
 NURS 2020A Growth and Development and Nursing (2)
 NURS 2040A Nutrition and Nursing (2) or NURS 4800B Interdisciplinary Course in Human Nutrition (3)
 NURS 3010A Pathophysiology and Nursing (2)
 NURS 3200A Nursing the Adult/Elderly I (3)
 NURS 3210A or B Nursing Parents and Newborn (3)
 NURS 3230B Nursing the Adult/Elderly II (5)
 NURS 3250B Clinical Nursing IV (3)
 NURS 4210A or B Nursing the Child/Adolescent (3)
 NURS 4220A or B Mental Health and Psychiatric Nursing (3)

OR

Nursing and interdisciplinary electives as offered each year.

Please refer to specific class descriptions.

Post RN students are not required to take N1010C (3), N2030B (2), N2200A (3), N2210B (4), N2220B (6), N3240B (3), and N4240B (5).

Class Descriptions

Required Non-nursing classes

Class descriptions for Chemistry 1430R, Anatomy 0101C, Physiology 1010R, Psychology 1000R, Sociology 1000R, Microbiology 1100A, Math 1060A or B and potential electives can be found in the calendar under specific departments/faculties.

Required Nursing Classes

NURS 1010C Introduction to Professional Nursing: 3 credit hours. Focuses on the development of professional nursing in the context of social and political climates with emphasis on nursing in Canada in the past,

present and future. Major concepts and theories are introduced including the role of professional nursing.

Format: 3 lecture hours/week
Prerequisites: None for Basic students
Enrolment: Limited to 1st year Basic students

NURS 2010A Helping Relationships and Nursing: 2 credit hours. Introduces helping relationship theory involving the nurse and individual clients. The dynamics of therapeutic communication are addressed with an opportunity in a laboratory setting for the development of skills necessary to facilitate client exploration and understanding.

Format: 1 lecture and 2 laboratory hours/week
Prerequisite: N1010C, Anatomy 0101C, Physiology 1010R, Chemistry 1430R, Psychology 1000R, Sociology 1000R for Basic students; N2230A co- or pre-requisite for Post RN students. THIS COURSE, PLUS N2230A, IS PRE-REQUISITE TO ALL OTHER REQUIRED NURSING COURSES FOR POST RNS.
Enrolment: Consult department

NURS 2020A Growth and Development and Nursing: 2 credit hours. Examines concepts and theories of normal growth and development of the individual from conception to old age. Roles and developmental stages are analyzed in regards to clients' attaining/maintaining an optimal level of health.

Format: 2 lecture hours/week
Prerequisite: N1010C, Anatomy 0101C, Physiology 1010R, Chemistry 1430R, Psychology 1000R, Sociology 1000R, or with permission of the professor for Basic students; none for Post RN students.
Enrolment: Consult department

NURS 2030B Pharmacology and Nursing: 2 credit hours. Application of general principles of pharmacology to nursing practice. Content areas will include drug actions on body systems and drug actions in specific conditions, as well as potential side effects. Principles guiding the nurse in the administration of drugs are studied.

Format: 2 lecture hours/week or 1 lecture and 2 laboratory hours/week
Prerequisite: N1010C, Anatomy 0101C, Physiology 1010R, Chemistry 1430R, Psychology 1000R, Sociology 1000R, N2010A, N2020A, N2200A for Basic students.

Enrolment: Limited to 2nd year Basic students

NURS 2040A Nutrition and Nursing: 2 credit hours. Introduces the science of nutrition as it applies to nursing. Content is organized around nutritional needs during developmental stages and in situations of health and illness. Environmental factors which influence clients' nutritional status are examined with emphasis on nursing interventions which promote an optimal level of health. Credit is not awarded for both NURS 2040 and NURS 4800.

Format: 2 lecture hours/week
Prerequisite: N1010C, Anatomy 0101C, Physiology 1010R, Chemistry 1430R, Psychology 1000R, Sociology 1000R, or with permission of the professor for Basic students; none for Post RN students.
Enrolment: Consult department

NURS 2200A Concepts and Skills of Nursing Practice I: 3 credit hours. Focuses on the role of the nurse in helping the individual meet basic needs and attain/maintain an optimal level of health. Nursing process is introduced and the assessment phase is covered in depth.

Format: 2 lecture and 2 laboratory hours/week
Prerequisite: N1010C, Anatomy 0101C, Physiology 1010R, Chemistry 1430R, Psychology 1000R, Sociology 1000R for Basic students.
Enrolment: Limited to 2nd year Basic students

NURS 2210B Concepts and Skills of Nursing Practice II: 4 credit hours. Focuses on the role of the nurse in helping the individual who is experiencing an altered ability to meet basic needs and attain/maintain an optimal level of health. Builds and extends directly on the content and theories discussed in N2200A. Assessment of diminished ability to meet basic needs caused by illness and/or hospitalization is also covered.

Format: 2 lecture and 4 laboratory hours/week or 2 lecture and 6 clinical hours/week
Prerequisite: N1010C, Anatomy 0101C, Physiology 1010R, Chemistry 1430R, Psychology 1000R, Sociology 1000R, N2010A, N2020A, N2200A for Basic students.
Enrolment: Limited to 2nd year Basic students

NURS 2220B Clinical Nursing I (Summer Session): 6 credit hours. A clinical nursing experience focusing on the care of the individual with a health problem, who has an

altered ability to meet basic needs and attain/maintain an optimal level of health. Gives the students an opportunity to practice and consolidate concepts, theories and skills learned in previous classes.

Format: 40 clinical hours/week x 8 weeks

Prerequisites: N2010A, N2020A, N2030B, N2040A, N2200A, N2210B, Microbiology 1100A for Basic students.

Enrolment: Limited to 2nd year Basic students

NURS 2230A Advanced Concepts and Skills of Nursing Practice: 4 credit hours. Focuses on the development and the role of nursing as a profession through an examination of nursing and other theories relevant to nursing practice. Laboratory and clinical experience provides opportunity to practice comprehensive health assessment skills and study the relationship between theory and practice.

Format: 2 lectures, 2 laboratory and 3 clinical hours/week

Prerequisites: Registration as a nurse and Anatomy 0101C and Physiology 1010R co- or pre-requisite, or with instructor's consent. THIS COURSE, PLUS N2010A, IS PRE-REQUISITE TO ALL OTHER REQUIRED NURSING COURSES FOR POST RNS.

Enrolment: Consult department

NURS 3010A Pathophysiology and Nursing: 2 credit hours. Focuses on pathophysiological alterations from normal health.

Manifestations of both acute and chronic illnesses are explored in terms of structural and functional changes from normal physiological functions.

Format: 2 lecture hours/week

Prerequisites: N2010A, N2020A, N2030B, N2040A, N2200A, N2210B, N2220B, Microbiology 1100A, Math 1060A or B. or with permission of the professor for Basic students; N2230A, N2010A, or with the instructor's consent for Post RN students.

Enrolment: Consult department

NURS 3020A Teaching and Learning and Nursing: 2 credit hours. Focuses on the role of the nurse as an educator. Principles and theories of teaching and learning are addressed to help clients acquire knowledge, skills and attitudes that enable them to attain/maintain an optimal level of health.

Format: 2 lecture hours/week

Prerequisite: N2010A, N2020A, N230B, N2040A, N2200A, N2210B, N2220B, Microbiology 1100A, Math 1060A or B or with permission of the professor for Basic students; N2230A, N2010A for Post RN students.

Enrolment: Consult department

NURS 3030B Nursing Research: 3 credit hours. Focuses on the application of the research process to nursing. Content areas include the logic and thought processes basic to research, research methodology, measurement techniques, ethical and legal implications of nursing research and analysis of the growing body of research based nursing knowledge.

Format: 2 lecture and 2 tutorial hours/week.

Prerequisite: N2010A, N2020A, N2030B, N2040A, N2200A, N2210B, N2220B, Microbiology 1100A, Math 1060A or B, or with permission of the professor for Basic students; N2230A, N2010A, Math 1060A or B, or with permission of the professor for Post RN students.

Enrolment: Consult department

NURS 3200A Nursing the Adult/Elderly with a Health Problem: Theory and Practice: 3 credit hours. Focuses on family-centered nursing management of adult and elderly clients with short-term acute health problems. Nursing and other relevant theories are applied to the nursing process in the care of individuals. Clinical experiences are mainly on short term surgical units.

Format: 1 lecture and 6 clinical hours/week

Prerequisite: N2010A, N2020A, N2030B, N2040A, N2200A, N2210B, N2220B, Microbiology 1100A, Math 1060A or B for Basic students; N2230A, N2010A for Post RN students.

Enrolment: Consult department

NURS 3210A or B Nursing the Parents and Newborn: Theory and Practice: 3 credit hours. Examines the physiological, psychological and sociological determinants of the childbearing experience and the nurse's role with individuals and families in this phase of their development. Clinical experience involves the pre-natal, intra-partal and post-partal periods.

Format: 1 lecture and 6 clinical hours/week

Prerequisite: N2010A, N2020A, N2030B, N2040A, N2200A, N2210B, N2220B, Microbiology

1100A, Math 1060A or B for Basic students; N2230A, N2010A for Post RN students.

Enrolment: Consult department

NURS 3220A or B Family Nursing: Theory and Practice: 4 credit hours. Students use the nursing process in the care of the family unit. Examines nursing, cultural, sociological and psychological theories and concepts and their relationships to the development of nursing skills necessary for the provision of care to the family unit.

Format: 2 lecture and 6 clinical hours/week or 2 lecture hours/week, 2 laboratory hours/week and 3 clinical hours/week

Prerequisite: Successful completion of 2nd year for Basic students; N2230A N2010A or B for Post RN's

NURS 3230B Nursing the Adult/Elderly with a Health Problem: Theory and Practice: 5 credit hours. Focuses on family-centered nursing management of adult and elderly clients with chronic health problems, of a medical nature. Emphasis is placed on theoretically based nursing strategies aimed at helping clients live with a chronic health problem.

Format: 2 lecture and 9 clinical hours/week

Prerequisite: N3010A, N3020A, N3200A for Basic students; N2230A, N2010A for Post RN students.

NURS 3240B Clinical Nursing II (Summer Session): 3 credit hours. Focuses on nursing care of ill adult/elderly clients with problems requiring medical/surgical interventions.

Format: 40 clinical hours/week x 3 weeks

Prerequisite: N3010A, N3020A, N3030B, N3200A, N3210A or B, N3220A or B, N3230B for Basic students.

Enrolment: Limited to 3rd year Basic students

NURS 3250B Clinical Nursing III (Summer Session): 3 credit hours. Focuses on nursing care of clients (individuals, families and aggregates) at various levels of health and illness. The experience offers the student an opportunity to promote health, prevent illness and provide care for the ill and facilitate rehabilitation in community settings. Clinical experiences are with formal health care agencies. Students are required to provide their own transportation and accommodations.

Format: 40 clinical hours/week x 3 weeks

Prerequisite: N3010A, N3020A, N3030B, N3200A, N3210A or B, N3220A or B, N3230B,

N3240B for Basic students; N2230A, N2010A, N3220A or B for Post RN students. Consult department

Enrolment:

NURS 4010B Trends and Issues in Nursing: 3 credit hours. Provides the learner with opportunities to develop skills in analyzing contemporary issues in nursing and health care delivery systems that have impact on the profession of nursing. Students consider historical, present and future perspectives of specific issues in order to work toward resolution of issues.

Format: 2 lecture hours/week

Prerequisite: N4030A, N4200A, N4210A or 4220A, or with permission of the professor for Basic students; N2230A, N2010A for Post RN students.

Enrolment: Consult department

NURS 4020A or B Advanced Skills in Helping Relationships and Interviewing: 1 credit hour. An advanced course in helping relationship theory involving a client population of individuals, families, and groups in a variety of clinical settings. Communication strategies for problem solving in complex health situations are addressed.

Format: 2 laboratory hours/week

Prerequisite: N2010A, N3010A, N3020A, N3030B, N3200A, N3210A or B, N3220A or B, N3230B, N3240B, N3250B, or with permission of the professor for Basic students; N2230A, N2010A for Post RN students.

Enrolment: Consult department

NURS 4030A Leadership in Nursing Practice: 3 credit hours. Focuses on the knowledge, skills and attitudes which facilitate leadership in nursing practice. Introduces theories, concepts and behaviours associated with leadership roles and explores them in relation to nursing.

Format: 2 lecture hours/week

Prerequisite: N3010A, N3020A, N3030B, N3200A, N3210A or B, N3220A or B, N3230B, N3240B, N3250B, or with permission of the professor for Basic students; N2230A, N2010A, or with permission of the professor for Post RN students.

Enrolment: Consult department

NURS 4200A Community Health Nursing: Theory and Practice I: 4 credit hours. An introduction to nursing and public health practice applied to the promotion and preservation of health, and the prevention of illness in client groups and communities. The philosophical basis, role, setting and functions of community health nursing are

examined. Emphasis is on assessing and planning nursing interventions with communities and groups.

Format: 1 lecture, 1 tutorial and 7 1/2 clinical hours/week

Prerequisites: N3010A, N3020A, N3030B, N3200A, N3210A or B, N3220A or B, N3230B, N3240B, N3250B for Basic students; N2230A, N2010A, N3220A or B, for post RN students.

Enrolment: Consult department

NURS 4210A or B Nursing the Child/Adolescent with Health Problems:

Theory and Practice: 3 credit hours. Focuses on a family-centered approach in the application of the nursing process to the care of children/adolescents with a health problem. Theories and concepts which help the student understand the impact of illness and hospitalization on the client are studied.

Format: 1 lecture and 6 clinical hours/week

Prerequisites: N3010A, N3020A, N3030B, N3200A, N3210A or B, N3220A or B, N3230B, N3240B, N3250B for Basic students; N2230A, N2010A, or with permission of the professor for Post RN students.

Enrolment: Consult department

NURS 4220A or B Mental Health and Psychiatric Nursing: Theory and Practice: 3 credit hours. Focuses on the nurse's role in working with clients (individuals and families) experiencing acute illness, and emotional concerns and disorders. Includes the concepts of mental illness, and psychiatric treatment and rehabilitation. Emphasis is placed on psychiatric nursing theories to promote communication skills.

Format: 1 lecture and 6 clinical hours/week

Prerequisites: N3010A, N3020A, N3030B, N3200A, N3210A or B, N3220A or B, N3230B, N3240B, N3250B for Basic students; N2230A, N2010A, or with permission of the professor for Post RN students.

Enrolment: Consult department

NURS 4230B Community Health Nursing: Theory and Practice II: 4 credit hours. Builds on the content of Community Health Nursing I with a focus on intervention strategies and evaluation methodology for the practice of community health nursing with client groups and communities. Examines the development of the health care delivery system, its function and the forces affecting its future.

Format: 1 lecture, 1 tutorial and 7 1/2 clinical hours/week

Prerequisite: N4200A

Enrolment: Consult Department

NURS 4240B Clinical Nursing IV: 5 credit hours. This senior clinical nursing class provides students with an opportunity to consolidate their nursing knowledge and skills with multiple clients as well as practice leadership skills learned in N4030A. Students may be able to choose a clinical setting based on their learning needs and special interest.

Format: 40 clinical hours/week x 5 weeks

Prerequisites: N4010B, N4020A or B, N4030A, N4200A, N4210A or B, N4220A or B, N4230B for Basic students.

Enrolment: Limited to 4th year Basic students

Human Sexuality Workshop: This is a required 15 hour non-credit workshop designed to provide students with an understanding of matters concerning human sexuality in a forum with members of Nursing, Medicine and Theology. The course is taught in the third and fourth years of the basic degree programme. Post RN students normally take the course during their final year of study.

Format: Consult department

Prerequisites: None

Enrolment: Consult department

Nursing Elective Classes

Basic students are required to complete 3 credit hours of nursing electives during their final year. Post RN students must complete 5 credit hours of nursing electives during their programme. **NOT ALL NURSING ELECTIVES ARE OFFERED EVERY YEAR.** Please consult the School to ascertain the 1993-94 offerings. When resources allow, the following are offered:

NURS 4310B Advanced Clinical Decision Making in Nursing (3)

NURS 4320B Transcultural Nursing: 3 credit hours. Cultural factors affecting health, health services, practitioners and nursing care will be studied. Principles and tools of transcultural nursing care will be studied using simulated and real cross-cultural nursing situations.

Format: 3 lecture hours/week

Prerequisite: None

Enrolment: Limited to 40

NURS 4330A or B Self-Directed Learning Projects in Nursing: 3 credit hours. Students may carry out an independent study or project related to the theory or practice of nursing, under the direction of the faculty facilitator. Students will be encouraged to

systematically identify, plan, execute and evaluate a learning project in nursing that is relevant to nursing practice.

Format: flexible according to study/project

Prerequisite: None

Enrolment: Limited to Faculty available

NURS 4340B Death and Dying: Implications for Nursing and Other Health Professions (3)

NURS 4350B Rehabilitation Concepts Applies to Nursing Chronically Ill and Disabled Adults (3)

NURS 4360B Management: The Process in Health Care Agencies (3)

Interdisciplinary Nursing Elective Classes

NURS 4370A Women and Aging: As women grow older the experience of aging is generally more difficult for them than for men. This class will explore the issues related to socio-economic factors that are major determinants of the well-being of aging women. Topics will include; aging as a process; menopause, violence against older women ("granny bashing"), older women and housing; self-image and sexuality; health and the aging woman; and older women and poverty.

Format: lecture/discussion/seminar 2 hours

Prerequisites: SOSA 1000, 1100, 1200, or two courses in Women's Studies

Cross-listing: SOSA 3245A/5245A, WOST 3810A

Enrolment: consult department

NURS 4800B Interdisciplinary Course in Human Nutrition: 3 credit hours, normally spring term. The class is an interdisciplinary study of the basic principles of nutrition needs throughout the life cycle. Physiological, psychological, socio-economic, physical, educational and cultural determinants are explored to explain why the nutritional status of Canadians can vary and how this variation affects the development of chronic disease. Special emphasis is given to community nutrition in the Atlantic Region. Credit is not awarded for both NURS 2040 and NURS 4800.

Format: 3 lecture hours/week

Prerequisite: Biology 1000 or with permission of the professor

cross-listing: PHAR 4950B, PHYT 3090B, HEED 2250B

Enrolment: With the permission of the professor for BA-level students; limited to Post RN students.

Please Note: Descriptions for the following classes that qualify as nursing electives can be found in the Health Professions Interdisciplinary entry in this calendar.

HLTH 4900A An Interdisciplinary Approach to Gerontology (Social Perspectives) (3)

Cross-listing: HEED 4498A, LEIS 4498A, OCCT 4417A, PHAR 4960A, PHSE 4498A, PHYT 4300A, SOSA 2060A.

HLTH 4910B An Interdisciplinary Approach to Gerontology (Health Perspectives) (3)

Cross-listing: HEED 4499B, LEIS 4499B, OCCT 4418B, PHAR 4970B, PHSE 4499B, PHYT 4301B.

HLTH 3000B An Interdisciplinary Approach to Health Promotion (3)

Classes Offered by Other Faculties

Classes offered by other faculties may be found in the calendar of the respective faculties. The following are required classes in the BSoN degree.

CHEM 1430R Introductory Chemistry and Biochemistry: 6 credit hours. Material in the first term is given by the Department of Chemistry and includes the fundamentals of general organic chemistry. In the second term medically relevant biochemistry is taught by the Department of Biochemistry.

Format: 3 lecture hours, 2 laboratory/tutorial hours

MICR 1100A: 3 credit hours. This class is given by the Department of Microbiology of the Faculty of Medicine to meet the needs of the students in the Faculty of Health Professions. Elementary bacteriology and immunology includes a study of the structure and physiology of microorganisms, the ways microorganisms cause disease in man and the ways they affect man's well-being. Laboratory work provides experience in the cultivation, isolation and identification of microorganisms and demonstrates their various activities.

Format: 1 lecture hour, 2 laboratory hours

ANAT 0101C: 3 credit hours. This class is taught by the Department of Anatomy and is an introductory anatomy class for health professional students. The class uses a systems approach to examine the microscopic and gross anatomy of the human body.

Format: 2 lecture hours and laboratory TBA

PHYL 1010R: 6 credit hours. This class is taught by the Department of Physiology and is an introductory physiology class for health professional students. The functions of body

organs and body systems and the integration of functions in the whole organism are studied.

Format: 2 lecture hours, 1-3 hour tutorial/ laboratory

Diploma Programme for Registered Nurses in Outpost and Community Health Nursing

The 15-month programme in Outpost and Community Health Nursing prepares registered nurses for positions in Canadian outpost settings where nurses are the only resident health-care professionals. Instruction during the programme is highly individualized and clinically oriented. One academic year, extending over a period of approximately eight months, is spent at the University. This is followed by a 28-week, University-directed internship located in northern Canada. Students are admitted to the programme in September and in January. A shortened stream beginning in August is offered for nurses with a baccalaureate degree in nursing. Students spend one expanded term (approx. 16 weeks) at the University followed by a 21 week internship in Northern Canada. A diploma in Outpost and Community Health Nursing is awarded at the completion of the programme. Current graduates of the programme, who are admitted to the Dalhousie BSoN programme for registered nurses, can complete the BSoN programme in approximately 18 months.

Fees and a living allowance are paid by the sponsoring agency to all students. In return, all students are committed to a period of employment within an outpost setting with the sponsoring agency after completion of the programme.

Course of Study for Outpost Nursing

First Year: at the University: NURS 0550A, NURS 0551B, NURS 0640B, NURS 0930A or B, NURS 0940A or B, NURS 0950A or B, NURS 0960A, NURS 4800B, HEED 1163A.

Internship: in northern Canada: NURS 0193A or B, NURS 0191A or B, NURS 0196A or B.

Students with baccalaureate degrees in nursing are exempted from NURS 0550, NURS 0551, NURS 0640, NURS 4800, NURS 0191 and possibly HEED 1163.

Students with baccalaureate degrees in Nursing are required to take NURS 0150 - Cross-cultural Nursing and NURS 0150 - Social Health Issues. Both are offered in the Northern Clinical Program. Course descriptions are available from the School of Nursing.

Classes Offered

All Outpost nursing classes (numbered NURS 0550 through HEED 1163A) are open only to students enrolled in the Outpost nursing programme.

NURS 0550A Community Health Nursing and Health Education: An introduction to theories, concepts, roles, tools and functions of community/public health nursing. Emphasis is on assessing, planning and evaluating nursing interventions with communities and groups in cross-cultural settings. Principles and theories of teaching and learning are examined with a focus on the nurse as an educator.

Format: Lectures, discussion, group exercises, term papers and presentations. 4 hours/week
A. Vukic

NURS 0551B Family Nursing: An introductory class examining theories, concepts and nursing skills necessary for the provision of care to the family unit. Health needs throughout the lifespan are examined and the influences of social and cultural factors explored. Clinical practice includes supervised home visiting to a family in the community. It offers the student an opportunity to provide nursing care at various levels of health and illness as an individual and a member of the health team.

Format: Lectures, discussion, presentations. 3 hours/week, clinical 2 hours/week
Instructor: A. Vukic

NURS 0640B Mental Health Issues: Mental health, as influenced by cultural, environmental, and developmental factors is addressed. Communication, leadership and problem solving skills are fostered through seminar discussion. Crisis theories and resolutions are explored. Emphasis is on transcultural community health nursing.

Format: seminars, group exercises, lectures, discussions. 2 hours/week
Instructor: A. Vukic

NURS 0930A or B Clinical Medicine: Common medical problems are addressed in seminars, clinical teaching and guided experience at local hospitals under the direction of Outpost Nursing Instructors and University Medical School personnel. Skill in taking histories and performing physical examinations is developed. Instruction and supervised practice in basic laboratory procedures is provided by the staff of the provincial pathology laboratory.

Instructors: R. Martin-Misener and K. Stares

NURS 0940A or B Clinical Obstetrics and Gynaecology: A programme of seminars, clinical teaching, and practical experience is conducted under the direction of Outpost Nursing Instructors and University Medical School personnel. This class emphasizes the evaluation and care of the normal obstetrical patient and her family. Attention is given to common gynaecological problems.

Supervised clinical experience is provided at the Grace Maternity Hospital. Discussion of common abnormal conditions and their recognition is included.

Instructor: M. Bender and K. Stares

NURS 0950A or B Clinical Paediatrics: Common paediatric problems are addressed in seminars, clinical teaching and guided experience at the IWK Children's under the direction of Outpost Nursing Instructors and University Medical School personnel. Clinical placement in the office of a practicing paediatrician is arranged. Skill in taking histories and examining children is developed. Consideration is given to normal growth and development and the health supervision of the well child.

Instructor: R. May

NURS 0960A Clinical Surgery: This class is designed to prepare the student to care for patients with minor surgical problems and to recognize and provide emergency care for patients with more serious conditions.

Students will complete the Basic Trauma Life Support Programme. An introduction to commonly encountered eye problems is included. This class is directed by Outpost Nursing instructors and University Medical School personnel.

Instructor: K. Cookersell

NURS 0191A or B Field Experience in Community Health Nursing: A six week period of supervised field experience in community health nursing is arranged at a northern health centre for outpost nursing students during their internship. It is designed to enable the student to practice, in a northern setting, the community health teaching offered previously in the programme.

NURS 0193A or B Hospital Clinical Practicum: A 14-week period of supervised clinical experience at a small northern hospital is arranged for outpost nursing students during their internship. This experience builds on clinical teaching offered previously in the programme and provides opportunity for students to strengthen clinical skills and judgement in a practice setting. Student experience is directed by the medical staff of the hospital and an Outpost Nursing instructor. Assignment to medical-surgical, obstetrical, paediatric, and ambulatory patients is arranged. Students have

opportunity, under supervision, to care for women during labour and to conduct normal deliveries.

NURS 0196A or B Nursing Station Field Experience: A six-week period of supervised field experience at a northern nursing station is arranged for outpost nursing students during their internship. This placement is designed to integrate teaching previously given during the programme and also to provide opportunity for students to become familiar with the types of administrative and supervisory roles which a nurse assumes in this setting. Students have the opportunity to experience challenges relating to living and working within an unfamiliar culture and in a remote area.

HEED 1163A: See description in Health Education section of the calendar.

NURS 4800 Human Nutrition - Interdisciplinary Course: See above description under this title.

Graduate Programme

For details of the Master's of Nursing programme, please consult the Faculty of Graduate Studies calendar.

School of Occupational Therapy

Location: Forrest Building, Room 215,
5869 University Avenue,
Halifax, N.S. B3H 3J5
Telephone: (902) 494-8804

Director

Barbara J. O'Shea, DipP & OT (Tor), BSo (Queen's), MS (Colorado State)

Professor

Barbara J. O'Shea, DipP & OT (Tor), BSo (Queen's), MS (Colorado State)

Associate Professor

Elizabeth Townsend, DipP & OT, BSo(OT) (Tor), MAEd (St FX)

Assistant Professors

Shelia Banks, BSc, MA (Dal)
Elizabeth B. Bell, DipP & OT (Tor) BSo (Queen's), MS (Virginia Commonwealth)
Susan E. Doble, BSo (OT) (Western), MS (Boston)

Lecturers

Sylvia Janelle, BSo(OT) (McG), MS (SUNY, Buffalo)
Mary H. Lloyd, DipOT (Man), BSo (Tor), MS (Colorado State)
Rosemary Lyeaght, BSc(OT) (Western), MS (N.Texas)
Anita Unruh, BSc(OT) (Western), MSW (Carleton)

Fieldwork Co-ordinator

Elizabeth B. Bell, DipP & OT (Tor) BSo (Queen's), MS (Virginia Commonwealth)

Provincial Fieldwork Co-ordinators

New Brunswick: Carol A. Morrison, BSo (OT) (McGill)
Newfoundland: Brenda Head, BSo(OT) (Alberta)
Nova Scotia: Sandra Taylor, Dip OT (Queen's)
Prince Edward Island: Heather Cutcliffe, DipOT (Man)

Honourary Appointments

A. John Clark, BSc, MD (Dal), Assistant Professor, Department of Anaesthetics, Faculty of Medicine
R. William Currie, BSA, MSc, PhD (Man), Assistant Professor, Department of Anatomy, Faculty of Medicine
Patrick McGrath, BA, MA (Sask), PhD (Queen's), Professor, Department of Psychology, Faculty of Science

Maryllynne Mitcham, PhD, OTR/L, FAOTA, Chair and Professor, Occupational Therapy Department, Associate Dean, School of Applied Rehabilitative and Supportive Sciences, College of Health Related Professions, Medical University of South Carolina
Alistair Munro, MD, FRCP(C), Professor and Head, Department of Psychiatry, Faculty of Medicine
Brenda Ryan, BA (St FX), MBA (Dal), Department of Health, Province of Nova Scotia
Jana Sawynok, BSo, MSo (Melb), PhD (Queen's), Associate Professor, Department of Pharmacology, Faculty of Medicine
Margaret Spindler, DipP & OT (Tor)
Joan Veronel, BSo (OT)(Tor), Director, Occupational Therapy, IWK Hospital for Children

Regional Accredited Facilities Currently Participating in the Fieldwork Programme

Practising occupational therapists in the Atlantic region give their time and expertise to a structured practical fieldwork programme. The following facilities provide fieldwork education for students:

New Brunswick

Bio-Engineering Institute, Fredericton
Centracare, Saint John
Chaleur Regional Hospital, Bathurst
Department of Health and Community Services, Saint John
Dr. Everett Chalmers Hospital, Fredericton
Extremural Hospital
George Dumont Hospital, Moncton
Forest Hill Rehabilitation Centre, Fredericton
Miramichi Hospital, Newcastle
Moncton City Hospital, Moncton
Restigouche Hospital Centre, Campbellton
Saint John Regional Hospital, Saint John
Worker's Rehabilitation Centre, Grand Bay

Newfoundland

Children's Rehabilitation Centre, St. John's
Health Sciences Centre, St. John's
St. Clare's Mercy Hospital, St. John's
St. John's Home Care Programme
Waterford Hospital, St. John's
Western Memorial Hospital, Corner Brook

Nova Scotia

Camp Hill Medical Centre, Halifax
Cape Breton Hospital, Sydney
Eastern Shore Memorial Hospital, Sheet Harbour
Fisheimen's Memorial Hospital, Lunenburg
Harbour View Hospital, North Sydney
Izaak Walton Killam Hospital for Children, Halifax

Northeide Harbourview Hospital Corp, North Sydney

Northwood Centre, Halifax

Nova Scotia Hospital, Dartmouth

Nova Scotia Rehabilitation Centre, Halifax

South Shore Memorial Hospital, Bridgewater

Valley Health Services, Waterville

Victoria General Hospital, Halifax

Prince Edward Island

Eric Found Centre, Charlottetown

Hillsborough Hospital, Charlottetown

Home Care Occupational Therapy

Prince County Hospital, Summerside

Queen Elizabeth Hospital, Charlottetown

Workers Compensation Board, Charlottetown

Regional History and Mandate

The School of Occupational Therapy was established in 1982 as the only occupational therapy education programme in the Atlantic Region. The School exists in response to strong regional advocacy, particularly since 1958 when a School was approved in principle by the University Senate. The regional orientation of the School fosters collaborative teaching, research and professional activities linking those at the University with occupational therapy and other service providers, government workers, and citizens in the four Atlantic Provinces.

What is Occupational Therapy?

Occupational therapy is a health profession concerned with restoring optimal occupational function, both physical and mental, in disabled individuals from all age groups, and assisting them to resume a responsible role in the family and in society. "Occupation" refers to all activities in which someone (child or adult) engages, including self care, home and community activities, work-related activities, and social and leisure activities. The occupational therapist evaluates function through an analysis of human performance, relationships and situations. Occupational therapy engages a person in directed experiential learning and problem solving activities which are appropriate to the individual and which have been scientifically selected to accomplish a specific functional goal. The dysfunctional person is taught to set realistic goals. Through occupational therapy, the person is guided in the acquisition of adaptive skills which enable resumption of a productive and satisfying role in society. Occupational therapy services are best delivered in the community within the normal environment of the client, although initial treatment

frequently occurs within a hospital or rehabilitation setting.

Career Opportunities

Occupational therapy practice is broad in scope and offers a wide range of career opportunities for both men and women as it is directed towards preventing or reducing the effects of dysfunction arising from any cause in any age group. Job opportunities exist for occupational therapists in acute and chronic care hospitals, mental retardation facilities, mental health centres, rehabilitation centres, nursing homes and community service agencies. Career opportunities for occupational therapists in schools, government, industry and correctional services are increasing. Occupational therapists may find careers in administration, education, research or consulting. Normally, graduate education would be required for careers in education and research.

Licence to Practice Occupational Therapy

In some provinces, occupational therapists require a licence to practice. The School of Occupational Therapy has no jurisdiction in matters relating to licensing. These functions are entirely under the control of the provincial licensing body. Information on provincial licensing regulations may be obtained from: the Nova Scotia Association of Occupational Therapists, PO Box 3082 Halifax South, Halifax, Nova Scotia, B3J 3J1; the New Brunswick Association of Occupational Therapists, c/o Occupational Therapy Services, Workers Rehabilitation Centre, PO Box 3067, Station B, Saint John, New Brunswick, E2M 4X7; the Prince Edward Island Association of Occupational Therapists, PO Box 2227, Charlottetown, P.E.I., C1A 3N3; or the Newfoundland and Labrador Association of Occupational Therapists, PO Box 5423, St. John's, Newfoundland, A1C B1B.

Professional Associations

The Canadian Association of Occupational Therapists represents the professional interests of occupational therapists across Canada at the national level. Membership is encouraged for students and graduates. Information on membership may be obtained from the School or by writing directly to: the Canadian Association of Occupational Therapists, 110 Eglinton Ave. W., 3rd Floor, Toronto, Ontario, M4R 1A3. Internationally, occupational therapy standards of education and practice are set

and maintained by the World Federation of Occupational Therapists.

Provincial professional organizations represent the interests of occupational therapists within a province. Further information may be obtained by writing directly to the organization. In the Atlantic region, these are: the Nova Scotia Society of Occupational Therapists, PO Box 3381, Halifax South, Halifax, Nova Scotia, B3J 3J1; the New Brunswick Association of Occupational Therapists, c/o Occupational Therapy Services, Workers Rehabilitation Centre, PO Box 3067, Station B, Saint John, New Brunswick, E2M 4X7; the Prince Edward Island Occupational Therapy Society, PO Box 2777, Charlottetown, Prince Edward Island, C1A 3N5; the Newfoundland & Labrador Association of Occupational Therapists, PO Box 5423, St. John's, Newfoundland, A1C B1B.

School of Occupational Therapy Regulations

All students are required to observe the University and Academic Regulations as described in this calendar.

1. Workload

Students must have their programme approved by their faculty advisor in the School of Occupational Therapy before registration each year. In seeking this approval, students should have determined their eligibility for the proposed classes by having satisfied the prerequisites prescribed. The elective classes must be at the 2000 level or higher. Electives should be chosen to expand knowledge in an area of special interest of relevance to occupational therapy. Electives must be approved by Director or faculty advisor. Except in special circumstances, a student's workload must not exceed the maximum workload described in Course of Study below. A maximum course load is 36, 35, and 34 credit hours respectively in years II, III, and IV (see Academic Regulation 4.1.3). For the purpose of residency and scholarship requirements 30 credit hours is considered a full course load in all years.

2. Grade Point Average Requirements

The grade point average system is described in the Academic Regulations. School regulations relating to GPA apply to students whose initial registration in the School was in the Fall of 1990 or earlier (consult calendar of the appropriate year).

3. Grade Requirements for Academic Classes

Professional classes are all classes with Occupational Therapy numbers. A student must obtain a grade of at least C (GPA 2.0) in each professional class for that class to be counted as a credit for the degree or as a prerequisite for another professional class. Passing grade in all non-professional required classes and electives is D. In grade point average calculations a D counts 1 point (see Academic Regulation 19.1.1).

A student who earns a grade of C or better for term work but fails a final exam worth 40% or more may be given a grade of INC and be required to complete additional work (Academic Regulation 19.5). In this instance, a grade of INC normally is permitted only where a student:

- achieved a final grade within 10% of a passing grade, and
- attained the required cumulative GPA at the end of the academic year.

A grade of INC normally is permitted in only one full credit or two part credits in one year and in three full credits or equivalent during the student's degree program. In cases, where INC is not permitted, the student must repeat that class to obtain a passing grade.

4. Grade Requirements of Fieldwork Classes

Fieldwork is graded on a Pass/Fail system. A student must obtain a passing grade in each fieldwork placement in order to be eligible to proceed in the programme.

5. Requirements for Promotion

Promotion each year is dependent upon satisfactory completion of fieldwork and achievement of academic requirements. The fieldwork requirement is satisfactory completion of OCCT 2221 for promotion to third year, and OCCT 3319 & 3321 for promotion to fourth year.

6. Degree Requirements

To satisfy requirements for the Degree of Bachelor of Science in Occupational Therapy, a student must:

- accumulate at least 135 credit hours (or the equivalent for a transfer student) including all prescribed classes, with a cumulative GPA of at least 2.00, and
- satisfactorily complete 975 hours of fieldwork experience, additional to credit classes (OCCT 2221: 150 hours, OCCT 3319: 225 hours, OCCT 3321: 300 hours, OCCT 4420: 300 hours)

7. Class Changes

Academic Regulation 6 applies to all class changes in Occupational Therapy with the exception of 4000 level B classes (except 4418B to which Regulation 4 applies).

The last day for adding all other 4000 level B classes in the School of Occupational Therapy is Friday of the first week following study break (see Schedule of Academic Dates).

The last day for withdrawing from all other 4000 level B classes in the School of Occupational Therapy without academic penalty is Friday of the second week following study break.

8. Degree with Honours Requirements

All classes taken while registered in the School of Occupational Therapy will be included in the GPA calculation to determine honours standing. Honours standing is achieved by students who satisfy degree requirements with a cumulative GPA of 3.00 or higher, have no grade in an advanced class (2000 level and above) less than B- and achieve a grade of A in OCCT 4421R.

9. Degree with First Class Honours Requirements

First class honours standing is achieved by students who satisfy degree requirements with a GPA of 3.70 or higher, have no grade in an advanced class (2000 level and above) less than B and achieve a grade of A in OCCT 4421R.

10. Required Withdrawal From the Programme

A student is normally required to withdraw from the programme if at the end of the academic year:

- (a) less than 22 credit hours have been accumulated in that year for full time students or less than the number of credit hours in which the student was registered have been accumulated for part-time students or
- (b) having accumulated sufficient credit hours the required cumulative GPA is not attained.

A student who fails a repeated class (academic or fieldwork) is normally required to withdraw from the programme.

11. Appeals

A student wishing to appeal a decision based on School regulations, should in the first instance attempt to resolve the issue with the instructor(s) concerned in academic classes or with the fieldwork coordinator and preceptor in fieldwork classes before proceeding according to School Appeal Procedures, a copy of which may be obtained

from the School Office. Briefly, such an appeal should be addressed to the Chairman of the School Committee on Studies and must clearly state the arguments and expectations of the petitioner (see Academic Regulation 26.2).

Programme Objectives

The Bachelor of Science programme in Occupational Therapy at Dalhousie University is designed to prepare generalist occupational therapists to be competent, responsible practitioners in the health care system of the Atlantic region. This honours baccalaureate programme has been designed to emphasize the theoretical foundation and scientific principles which form the base for occupational therapy practice. With this knowledge base, the students are guided in the development of the skills required by entry level occupational therapists through fieldwork experiences integrated with the academic curriculum.

The School of Occupational Therapy at Dalhousie University is a regional school serving the four Atlantic Provinces. Since many practice settings in the Atlantic region are non-traditional in nature, the programme is designed to provide students with opportunities to apply and practice skills in a variety of settings and with a range of clients from different age and diagnostic groupings. With this background, graduates will be prepared to accept the challenge of expanding the occupational therapy services in the Atlantic region.

The educational approach used in the Occupational Therapy programme at Dalhousie University is one which encourages logical thinking, creative problem solving and the application of scientific principles to the occupational therapy clinical reasoning process. The medium of occupational therapy is presented as purposeful activity in its broadest context. Students have an opportunity to familiarize themselves with a wide range of activities and to become adept at analyzing activities for therapeutic use.

The emphasis on the scientific nature of Occupational Therapy practice culminates in the fourth year of the programme in which students are required to complete a clinical research project in conjunction with their final fieldwork placement. This project addresses a clinical research question pertinent to occupational therapy practice in Atlantic Canada.

The Bachelor of Science (Occupational Therapy) programme embraces the educational standards of the Canadian Association of Occupational Therapists (CAOT) and is fully accredited by that body. Graduates are eligible to take the Certification

Examination offered by CAOT. Successful completion of this examination is required for membership in CAOT and for licensure to practice in provinces where practice is governed by statute.

Programme

The degree of Bachelor of Science (Occupational Therapy) requires a minimum of four years of University study. The programme of study requires at least one year of general science followed by three years of occupational therapy. Applicants must successfully complete the prescribed first year course of study in the College of Arts and Science at Dalhousie University or the equivalent programme at another recognized university before they can be considered for admission to the School of Occupational Therapy. These requirements must be completed by May in the year of expected admission to the School of Occupational Therapy.

Fieldwork

Fieldwork is the practical component of the educational programme completed in a variety of clinical facilities in which students have direct contact with patients/clients. It enables students to integrate theoretical knowledge with practice and to demonstrate their knowledge and professional competence in actual practice situations.

All fieldwork is completed in full-time blocks which are integrated with the academic programme. The block curriculum design permits full use of clinical facilities throughout the Atlantic region and allows students the opportunity of gaining experience in other parts of Canada as well. The second year of the programme has a normal academic schedule as well as four weeks of fieldwork during the summer months. In the third and fourth year respectively, a 6-week block and a 7-week block of full-time fieldwork is included within the second academic term. During the 1237.5 fieldwork hours, each student must gain a balance of experience in the treatment of both physical and psychosocial occupational dysfunction. As far as possible, students are placed to gain experience in at least one specialized programme such as programmes for children or elderly people or programmes in the community. Students may be assigned to fieldwork placements in occupational therapy programmes in any of the four Atlantic provinces. Normally a student will complete at least two regional placements outside the Halifax/Dartmouth area and one 8-week placement outside the Atlantic region for which there is a \$30.00 placement fee. Students are responsible for

the placement fee and for travel and living costs associated with fieldwork. Placements will be arranged by the School and will be assigned on the basis of the student's previous fieldwork experience and level of preparation.

Fieldwork hours are completed in the following pattern, calculated on the basis of a 37.5 hour week:

- 4 weeks following Year 2: (OCCT 2221) 150.0 hours
- 6 weeks during Year 3: (OCCT 3319) 225.0 hours
- 8 weeks following Year 3: (OCCT 3321) 300.0 hours
- 8 weeks following Year 3 or Year 4: (OCCT 4420) 300.0 hours
- 7 weeks during Year 4: (as part of OCCT 4421R) 262.5 hours

TOTAL: 33 weeks; 1,237.5 hours

Course of Study

The prescribed first-year classes are listed in the section describing admission requirements.

Year 2: Anatomy 217R, Anatomy 210B, Physiology 2030R, Occupational Therapy 2207A, 2208A, 2210C, 2213B, 2215B, 2218C, 2221B and Statistics 1080A (if no previous credit in Statistics).

Year 3: Physiology 3110A, Occupational Therapy 3300R, 3302C, 3305B, 3306A, 3307C, 3308C, 3310A, 3318C, 3319B, 3321B, and one 3 credit hour elective in psychology or sociology, 2000 level or above.

Year 4: Health Services Administration 4001A, Occupational Therapy 4420A or B, 4400A, 4404A, 4407A, 4419R, 4421R, 6 credit hours of electives in Occupational Therapy, 6 credit hours of electives chosen from Arts and Science, Administrative Studies, Education, Health Professions, or Medicine, 2000 level or above.

All classes are completed during the normal academic year with the exception of Occupational Therapy 2221B, 3319B, 3321B, and 4420A or B which are completed during the summer months (see class descriptions).

Classes Offered

Required Classes

ANAT 217R Gross Anatomy: The gross structure of the human body is presented by anatomical regions through lectures, dissection, and laboratory study. The class, only open to occupational therapy students, includes practical sessions in surface and functional anatomy as well as

lecture/demonstrations in radiological anatomy.

Credit Hours: 6
Instructor: Dr. G. Sinha
Format: Lecture, 3 hours; Lab, 4 hours
Enrolment: 36 (limited to OT students)

ANAT 210B Neuroanatomy: This class provides the student with an introduction to the organization and integration of the human nervous system.

Credit Hours: 3
Instructor: Dr. D. Hopkins
Format: Lecture, 2 hours; Lab, 2 hours
Corequisite: Anatomy 217R
Enrolment: 36 (limited to OT students)

STAT 1060A Introductory Statistics for Science and Health Science: Refer to the Statistics section of this calendar.

PHYL 2030R Human Physiology: The function of organs and body systems is presented through lectures and laboratory work. Special emphasis is on the integration of function in the whole organism.

Credit Hours: 6
Instructor: Dr. J. Duder
Format: Lecture/Tutorial, 4 hours; Lab, 3 hours (B-term only)
Prerequisite: two classes from Biology, Physics, Chemistry
Co-requisite: Anatomy 217R
Enrolment: 36 (limited to occupational therapy students)

OCCT 2207A Occupational Function: Life Span Development: Theories and processes of physical, psychological and social development throughout the life cycle are presented and related to occupational development through the life span. Roles and developmental life tasks are analyzed and discussed with particular reference to facilitation of adaptive occupational function. The course will also focus on the significance of human development to the practice of occupational therapy.

Credit Hours: 3
Instructor: TBA
Format: Lecture, 3 hours
Prerequisite: Psychology 1000, 1010 or 1500, Sociology 1000, 1050, 1100 or 1200
Enrolment: 36 (limited to occupational therapy students)

OCCT 2208A Occupational Therapy: Theory and Process: The theoretical base of occupational therapy practice is addressed through the work of Mosey, Kielhofner and other theorists. Students gain an appreciation of the relationship between theory and practice through case problem solving and experiential activities using a generic human occupation frame of reference.

Credit Hours: 3

Instructor: B. O'Shea
Format: lecture 3 hours; lab 2 hours
Prerequisite: Sociology 1000, 1050, 1100 or 1200, Psychology 1000, 1010 or 1500
Enrolment: 36 (limited to occupational therapy students)

OCCT 2210C Kinesiology: The scientific approach to the analysis of human movement is introduced. Mechanical principles governing human motion and functional anatomy are discussed and inter-related to develop an understanding of the factors responsible for normal movement. Techniques of analysis of the physical components of activities using observation skills and motion analysis technology are also presented.

Credit Hours: 2
Instructor: TBA
Format: lecture/lab, 2 hours
Corequisite: Anatomy 217R
Enrolment: 36 (limited to occupational therapy students)

OCCT 2213B Occupations - Analysis, Therapeutic Selection and Adaptation: The medium of occupational therapy intervention is activity, defined in its broadest concept. The role of activity in accomplishing life tasks, satisfying physical and emotional needs and restoring physical and mental occupational health is explored. Through independent learning modules and directed laboratory experience, students analyze a range of activities. Analysis of the physical, cognitive, perceptual and psychosocial demands of an activity are related to the therapeutic selection and adaptation of activity to meet defined client goals.

Credit Hours: 3
Instructor: Staff
Format: lecture/lab, 4 hours
Prerequisite: OCCT 2208A
Corequisite: OCCT 2210C, Anat 217R
Enrolment: 36 (limited to occupational therapy students)

OCCT 2215B Occupational Assessment: Description and Measurement: The course introduces students, prior to their first fieldwork experience, to the concepts, methods and issues in occupational assessment. Through self-directed learning modules, students analyze and practice qualitative and quantitative approaches for assessing individuals' occupational function within their environment. At an introductory level, students learn to develop occupational descriptions which are "trustworthy" and to complete "reliable", "valid" occupational measurement. Assignments require students to integrate, at a basic level, qualitative and quantitative data collection with knowledge of occupational therapy theory, occupational

life span development, anatomy, kinesiology, professional practice, and occupational analysis, selection and adaptation. The ideas and methods introduced here are developed in students' fieldwork education, 3rd year therapeutic procedures courses, and 4th year courses in program design and scientific inquiry.

Credit Hours: 3
Instructor: E. Townsend
Format: problem-based seminars/labs/self-directed assignments, 5 hours
Prerequisite: Psychology 1000, 1010, 1500; Sociology 1000, 1050, 1100 or 1200; Stats 1080A; OCCT 2207A and 2208A
Corequisite: Anat 217R; Anat 210B, PHYL 2030R, OCCT 2210C, OCCT 2213B, OCCT 2218C
Enrolment: 36 (limited to occupational therapy students)

OCCT 2218C Introduction to Professional Practice: The professional skills and ethics fundamental to the practice of occupational therapy are introduced by means of seminar and practical experience. Both dyadic and group therapeutic interaction are examined using communication skills in a variety of professional relationships. Other clinical practice skills such as professional behaviour, interviewing, and the application of the occupational therapy clinical reasoning process are also taught. Brief field experiences in clinical occupational therapy programmes augment didactic and experiential classroom instruction. These skills are applied during fieldwork: Level 1.
Credit Hours: 4

Instructor: TBA
Format: seminar/practical, 2 hours
Co-requisite: OCCT 2207A, OCCT 2208A
Enrolment: 36 (limited to occupational therapy students)

OCCT 2221B Fieldwork I: This initial four-week field experience in an accredited setting in the Atlantic region introduces the student to occupational therapy practice environments. Here, under the on-going direction of their clinical preceptor, students begin to observe and learn professional skills and patterns of behaviour. They practice specific clinical skills with clients in harmony with the stated clinical learning objectives.
Credit Hours: 0

Co-requisite: all other prescribed second year classes except Stats 1080A
Enrolment: 36

PHYL 3110A Neurophysiology: The student is provided with the principles of neurophysiology. Current concepts of the

organization and function of the mammalian nervous system are surveyed.

Credit Hours: 3
Instructor: D. Reamussen
Format: lecture/tutorial, 5 hours
Prerequisite: Physiology 2030R, Anatomy 210B
Enrolment: 36

OCCT 3300R Medical and Surgical Conditions: Physicians and surgeons present the etiology, pathophysiology and medical management of medical and surgical conditions frequently encountered in practice by occupational therapists. Musculoskeletal, neurological, rheumatic, respiratory, cardiac and general medical conditions are covered. Specific management strategies relevant to different age groups are presented. Rehabilitation management of residual dysfunction is discussed in relation to the team role of the occupational therapist.

Credit Hours: 6
Instructor: S. Banks, Staff
Format: Lecture
Prerequisite: Anatomy 217R, 210B, Physiology 2030R, OCCT 2210C
Corequisite: Physiology 3110B
Enrolment: 36

OCCT 3302C Mental Disorders: (OCCT 3302C replaces OCCT 2201B and OCCT 3301A) This course provides an overview of the field of psychiatry and mental disorders. Students learn about legal and ethical guidelines for psychiatric diagnosis and treatment, and about the classification, epidemiology, multiple causation and assessment of mental disorders. The etiology, symptoms, behaviour, functional problems, treatment, management and prognosis of a variety of mental disorders occurring in persons of all ages including children, adolescents, adults and the elderly are reviewed. The management of mental disorders in those with developmental disabilities and those with chronic mental disorders is discussed. Other management issues such as indications for individual or group, institutional or community treatment are considered.

Credit Hours: 5
Instructor: S. Doble, Staff
Format: Lectures, 3 hours
Prerequisite: Psychology 1000, 1010 or 1500, OCCT 2207A
Enrolment: 36

OCCT 3306B Therapeutic Procedures - Biomechanical: The principles and techniques of biomechanical analysis are applied to the development of joint protection programmes and programmes to increase joint mobility, muscle strength and endurance in conditions which result in musculoskeletal dysfunction. Mechanical principles are applied to the

adaptation of equipment and procedures to achieve maximum restoration of function. Graduated work conditioning programmes are discussed. Biofeedback is presented as an adjunct to therapeutic programmes.

Credit Hours: 2

Instructor: TBA

Format: Lecture/Lab 4 hours

Prerequisites: Anatomy 217R, Physiology 2030R, OCCT 2207A, OCCT 2208A, OCCT 2210C, OCCT 2213B, OCCT 2215B, OCCT 2218C

Corequisite: OCCT 3300R

Enrolment: 36

OCCT 3306A Therapeutic Procedures - Rehabilitative: The theory and principles of rehabilitation are presented and applied to the management of temporary and permanent disability. Evaluation tools used include functional assessment, vocational and pre-vocational testing and environmental accessibility evaluation. The principle of adaptation applied to performance, equipment, and environment is integrated with the problem solving approach in planning programmes to achieve maximum function at home, at work, at school, and in the community.

Credit Hours: 2

Instructor: M. Lloyd

Format: Lecture/Lab, 4 hours

Prerequisites: Anatomy 217R, Physiology 2030R, OCCT 2207A, OCCT 2208A, OCCT 2210C, OCCT 2213B, OCCT 2215B, OCCT 2218C

Corequisites: OCCT 3300R, OCCT 3302C

Enrolment: 36

OCCT 3307C Therapeutic Procedures - Psychosocial: This course is designed to increase students' understanding of the psychosocial adaptation problems experienced by those with mental disorders, physical disorders, developmental disabilities, and lifestyle problems. Major psychosocial issues, such as the influences that change, loss of meaning and feelings of incompetence have on individuals' occupational functioning, will be explored. Students will be provided with opportunities to develop the ability to apply theoretical frames of reference of the practice of psychosocial occupational therapy. The ability to determine the occupational needs of individuals experiencing psychosocial dysfunction, and to apply techniques and strategies to restore, maintain and/or develop occupational functioning will be emphasized. Through the use of case studies, students will learn how to develop and implement individual and group intervention programs in community-based and institutionally-based

settings for clients at various stages of the life cycle.

Credit Hours: 4

Instructor: S. Doble

Format: Lecture/Lab; 3 hours

Prerequisites: OCCT 2207A, OCCT 2208A, OCCT 2218C, OCCT 2213B, OCCT 2215B

Co-requisite: OCCT 3302C

Enrolment: 36

OCCT 3308C Therapeutic Procedures - Neurodevelopmental: Current theories of the neurodevelopmental approach to the remediation of dysfunction resulting from neurological damage are presented. Theoretical constructs are applied to the development of occupational therapy programmes for clients with congenital, neonatal and acquired neurological defects. Evaluation tools and treatment strategies appropriate for neurological dysfunction are presented and practised. Among the current theorists discussed are Ayres, Bobath, Brunstrom and Rood.

Credit Hours: 3

Instructor: TBA

Format: Lecture, 3 hours

Prerequisite: Anatomy 217R, 210B, Physiology 2030R, OCCT 2207A, OCCT 2208A, OCCT 2218C, OCCT 2213B, OCCT 2215B

Co-requisites: Physiology 3110B, OCCT 3300R

Enrolment: 36

OCCT 3310A Rehabilitation Technology: This class addresses primarily three areas of rehabilitation technology, namely orthotics, prosthetics and the use of computerized technical aids in occupational therapy. The principles and current theories of orthotic and prosthetic management of upper and lower limb problems are presented along with laboratory experience in design and construction of static and dynamic orthoses. Technical aids used in occupational therapy range from simple therapeutic computer applications to computerized environmental controls and communication aids. Emphasis is on problem analysis and design of simple devices and evaluation and selection of technology to solve occupational problems.

Credit Hours: 3

Instructor: M. Lloyd

Format: lecture/lab, 6 hours

Prerequisites: Anatomy 217R, Physiology 2030R, OCCT 2208A, OCCT 2210C, OCCT 2213B, OCCT 2215B, OCCT 2218C

Co-requisites: OCCT 3300R, OCCT 3305A, OCCT 3306A

Enrolment: 36

OCCT 3318C Professional Practice: This course expands on the clinical skills studied in OCCT 2220C and Fieldwork I to include an in-depth perspective of family dynamics pertinent to occupational therapists and a broad understanding of leadership, co-leadership, group dynamics, programme planning for groups, and analysis of group process.

Credit Hours: 4
Instructor: R. Lysaght
Format: lecture/practical, 2 hours
Prerequisites: All second year classes
Co-requisites: All third year classes except OCCT 3319B and OCCT 3321B
Enrolment: 36

OCCT 3319B Fieldwork II: This six-week field experience progresses the development of students' occupational therapy skills. Students continue to develop skills and patterns of behaviour and begin to develop role functions through modelling on the behaviours of their preceptor. Students progress in developing their clinical reasoning skills in the context of client-centred problem solving with on-going coaching and monitoring by the preceptor.

Credit Hours: 0
Co-requisites: All third year classes except elective and OCCT 3321B
Enrolment: 36

OCCT 3321B Fieldwork III: In this eight week regional field experience, students assume partial responsibility for a small caseload with regular coaching by their preceptors. Experience is obtained in applying therapeutic principles to clinical problems. Student continue to develop skills and patterns of behaviour and begin to acquire competence in the role of occupational therapist.

Students at this level complete a community project that enables the students to explore the community beyond the practice setting.
Credit Hours: 0
Co-requisites: All third year classes except elective
Enrolment: 36

HSA 4001A Health Services Management: The development and structure of the Canadian Health Care System are presented. The management cycle is taught with an emphasis on effective management of human resources. Legal and ethical issues are explored in the context of health services management.

Credit Hours: 3
Instructor: TBA
Format: lecture

OCCT 4400A Pharmacology: This class covers the effects, side effects, indications and contraindications of major classes of drugs used in selected medical and

psychiatric conditions. The issue of compliance is discussed.

Credit Hours: 1
Instructor: Staff
Format: Lecture, 1 hour
Prerequisite: Physiology 3110A, OCCT 3300R, OCCT 3302C
Enrolment: 36

OCCT 4404A Occupational Therapy Program Design and Evaluation: The process of how to design remediation, maintenance, promotion and prevention programs to meet the occupational performance needs of various target populations is addressed. Students are provided with opportunities to explore how various factors, such as qualities of the setting and professional theoretical models, will influence the design and implementation of a program. Strategies that one might utilize to enhance the process of developing and implementing programs are identified. In order to ensure that programs meet the needs of the target population, students determine how to develop evaluation protocols that will measure the process, impact and outcome of programs.

Credit Hours: 3
Instructor: S. Doble
Format: lecture/lab; 3 hours
Prerequisites: all third year classes
Enrolment: 36

OCCT 4407A Scientific Inquiry in Occupational Therapy: Basic research methodology and its application to occupational therapy practice are discussed. Emphasis is on treatment evaluation and clinical investigations based on scientific principles. Students learn to design clinical recording methods to facilitate analysis of treatment effects. Critical analysis and interpretation of research literature is included. @BILL = Credit Hours:

3
Instructor: TBA
Format: Lecture, 3 hours
Prerequisites: Stats 1060A, OCCT 3321B
Enrolment: 36

OCCT 4419R Advanced Professional Practice: Occupational therapy practice as it influences systems and society is the focus of practice issues discussed in this course. Issues of empowerment, independent living, community development, health promotion and prevention of disability are discussed within the context of occupational performance. Students are offered opportunities for exploring and practicing professional roles as consultant, advocate, educator and community planner within a variety of social systems including health, social services, corrections, education and employment.

Credit Hours: 6

Instructor: E. Townsend
Format: Lecture/Project; 4 hours
Prerequisites: All third year classes
Enrolment: 36

OCCT 4420A or B Fieldwork IV: Eight weeks are spent in practice under professional direction. Students develop competence in applying theoretical knowledge and clinical skills to identification and definition of client problems, planning and conducting treatment programmes and measuring goal attainment. Under supervision, students assume responsibility for a caseload of approximately 75% of that of an entry level therapist. Opportunities for involvement in community health care programmes are included. This class would normally be completed in the summer preceding the fourth year.

Credit Hours: 0
Prerequisite: OCCT 3321B
Enrolment: 36

OCCT 4421R Independent Study and Advanced Fieldwork: Students complete a scientific study of an approved topic under the direction of an assigned tutor. Topics must be relevant to current occupational therapy practice. Seven weeks of fieldwork experience relevant to the topic of study are used to increase knowledge and experience in the area and allow collection of data pertinent to the study. A seminar presentation and typewritten report or journal article are required.

Credit Hours: 6
Instructor: S. Banks
Prerequisites: State 1060A, all third year classes

Corequisites: OCCT 4404A, OCCT 4407A, OCCT 4419R

Enrolment: 36

Occupational Therapy Electives

OCCT 4412B Advanced Neurodevelopmental and Sensory Integration Therapy: An in-depth analysis of advanced theories and techniques of neurodevelopmental and sensory integration therapy. Experience in applying these therapeutic procedures to clinical problems is gained in laboratory sessions and through individual clinical tutoring.

Credit Hours: 3
Instructor: Staff
Prerequisites: Anatomy 210B, Physiology 3110A, OCCT 3308C and OCCT 3321B

OCCT 4416B Vocational Rehabilitation: The role of the occupational therapist in vocational rehabilitation is explored. Job analyses, pre-vocational skills exploration and evaluation, job sample design and evaluation, situational assessment and work adjustment programmes are major topics. Work related

aptitude testing and career counselling methods are discussed in relation to individuals experiencing physical, cognitive and emotional dysfunctions. The use of work information indexes and relevant community resources is emphasized.

Credit Hours: 3
Instructor: Staff
Prerequisites: OCCT 3305B, OCCT 3306A, OCCT 3321B

OCCT 4425B/4426B/4427B Directed Study in Occupational Therapy: In this course students may individually or in small groups explore a particular topic within occupational therapy under the direction of a faculty member. The topic and requirements for the class are jointly decided by the students and the professor involved. An outline of the objectives and evaluation methods for the class must be approved by the Committee on Studies before class work begins. A paper or presentation prepared for this class may not be submitted for credit in any other class.

Credit Hours: 3
Instructor: Staff
Prerequisite: Permission of Committee on Studies

OCCT 4417A Interdisciplinary Approach to Gerontology (Social Perspectives): See entry under Health Professions Interdisciplinary classes for description.

Cross-listing: HEED 4498A, HLTH 4900A, LEIS 4498A, PHAR 4960A, PHSE 4498A, PHYT 4300A, SOSA 2060A

OCCT 4418B Interdisciplinary Approach to Gerontology (Health Perspectives): See entry under Health Professions Interdisciplinary classes for description.

Cross-listing: HEED 4499B, HLTH 4910B, LEIS 4499B, PHAR 4970B, PHSE 4499B, PHYT 4301B

Oceanography

Location: Life Sciences Centre
 Telephone: (902) 494-3557

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A.J. Bowen

Undergraduate Advisor

B.R. Ruddick (494-2505)

Graduate Advisor

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- C. Beaumont, BSc (Sussex), PhD (Dal)
- A.J. Bowen, MA (Cantab), PhD (Scripps)
- C.M. Boyd, MA (Ind), PhD (Scripps)
- P. Chylek, Diploma (Charles), PhD (Calif)
- R.O. Fournier, MSc (Wm. & Mary), PhD (URI)
 Associate Vice-President (Research)
- E.L. Mills, BSc (Carl), MS, PhD (Yale)
- R.M. Moore, BA (Oxon), PhD (Southampton)
- B.R. Ruddick, BSc (UVic), PhD (MIT)

Associate Professors

- B.P. Boudreau, BSc (UNB), PhD (Yale)
- J. Grant, BSc (Duke), PhD (South Carolina)
- M.R. Lewis, BS, MS (UMd), PhD (Dal)
- K.E. Louden, BA (Oberlin), MEd (Temple),
 PhD (MIT)
- K.R. Thompson, BSc, MSc (UMano), PhD
 (UV) (jointly with Mathematics, Statistics and
 Computing Science)

Assistant Professors

- G. Hertzman BSc, MSc (UBC), PhD (Wash)
- P.S. Hill, AB (Dartmouth), MSc, PhD (Wash)
- Wm. Hyde, BSc (Toronto), MSc (Waterloo),
 PhD (Tor)
- D. Kelley, BSc (Mt A), PhD (Dal) (NSERC
 University Research Fellow)

Honorary Adjunct Professors

- R.C. Courtney, BSc, MSc (Dal), PhD
 (Cambridge)
- J.S. Craigie, BA, MA, PhD (Quebec)
- J. Cullen, AB (Calif), PhD (Scripps)
- K.T. Frank, BSc, PhD (Toledo)
- E.T. Hargrave, BSc, MSc (Dal), PhD (UBC)
- K. Higuchi, BSc (Carleton), MSc, PhD (UofT)
- G. Isaac, BSc, MSc, PhD (McGill)
- M. King, BA (Colorado Coll), MSc, PhD
 (Arizona)
- L. Mayer, BS (Univ. Rhode Island), PhD
 (Scripps)
- S. Pearce, BSc (Virginia), MSc, PhD (Dal)
- D.J.W. Piper, BA, MA, PhD (Cantab)
- S. Sethyendranath, BSc (St. Teresa's
 College), PhD (Univ. P&M Curie)
- J.N. Smith, BSc (McGill), MSc (Chicago), PhD
 (UofT)
- P.C. Smith, BSc, MS (Brown, PhD (MIT/WHOI))

Introduction

Oceanography is an inter-disciplinary science that includes studies of tides and currents, the chemistry of sea water, plants and animals that live in the sea, and ocean bottom sediments and underlying crustal structures. The Atmospheric Science group applies physics, mathematics and other basic sciences to the study of the atmosphere, its weather, and its climate. In addition, they conduct field and laboratory measurement programmes and analyze data from these and other experiments; and as well, model climate-related processes at less than global scale. Career oceanographers are employed in Canada in a few universities, in various federal laboratories that are engaged in both basic research and applied problems which meet a national need, such as fisheries investigations, exploration for offshore mineral resources, and studies of ice in navigable waters, and in a number of private companies interested in marine environmental protection or exploration.

A good background in basic science is a necessary prerequisite to entering the department. Properly prepared undergraduates are permitted to take one or more graduate classes as electives. There are graduate introductory classes which survey the entire field and advanced classes in each of the major specialties - physical, chemical, geological and biological oceanography and atmospheric sciences.

In addition, several undergraduate classes are offered. Classes marked * are not offered every year. Please consult the timetable on registration to determine if this class is offered.

Classes Offered

OCEA 2850R Introduction to Oceanography:
 A general survey of Oceanography showing how the oceans, which account for more than 70% of the earth's surface, function as a dominant environmental force.

Consideration also is given to man's impact on the ecological system. Designed to give a background of feeling for the ocean, what oceanography is, and what oceanographers do. It is not a good "background to science" class, since little feeling will be obtained for scientific techniques which would otherwise be acquired in a laboratory class. Most of the material covered is descriptive rather than basic, inasmuch as it is impossible in the time allowed and the material covered to also teach the basic required sciences.

Instructor: R.O. Fournier

Format: Lecture 3 hours

Prerequisites: Restricted to second year, or more advanced students

OCEA 2851A/2852B Introduction to Oceanography: These classes will cover topics already described under OCEA 2850R and are only open to Marine Biology Co-Op students that are unable to take OCEA 2850R due to their work term schedules. These students must take both classes as they are mandatory requirements for Marine Biology Honours. The format, instructor and pre-requisites are the same as for OCEA 2850R.

SCI 3000R Science Fundamentals: An interdisciplinary class that stresses the motivations, methodologies, and responsibilities of scientists, and provides extensive formal instruction in written and oral communication of scientific material. For details, see main calendar entry "Science, Interdisciplinary." The status of this class (elective, minor, or major credit) varies from department to department; check with your undergraduate advisor.

OCEA 4110B Introduction to Geological Oceanography: This is a one-term introductory class for new graduate students in oceanography who have little or no knowledge of geology or geophysics. The class content is mainly descriptive, and no subject is treated in great depth.

Instructor: P. Hill
Format: Lecture 3 hours
Prerequisites: instructor's consent

OCEA 4120A Introductory Physical Oceanography: This class explores some of the physical forces driving the oceans, and describes the responses of ocean water to these forces. Scales of ocean motion discussed range from currents of oceanic dimensions, like the Gulf Stream, through tides and waves, right down to very small-scale random movements of water known as turbulence. The class also includes a brief introduction to practical aspects of instruments and methodology, via a field trip and a laboratory session.

Instructor: B. Ruddick
Format: Lecture 3 hours
Prerequisites: instructor's consent

OCEA 4130A Introductory Chemical Oceanography: This class covers the major and minor constituents of sea water, the controls on its chemical composition, nutrient cycling and the chemical interactions between ocean and atmosphere. Other topics included are chemical tracers, and radiochemical dating methods, stable isotope studies, chemical speciation and chemical models of sea water.

Instructor: R.M. Moore
Format: Lecture 3 hours, some labs
Prerequisites: instructor's consent

OCEA 4150A Introductory Biological Oceanography: Quantitative descriptions of biological oceanographic processes are used to explore interactions with physical and chemical processes in various oceanic ecosystems. Topics discussed range from factors affecting rates of microbial photosynthesis to expected response of the ocean ecosystem to global variation in carbon dioxide and climate. Laboratory emphasizes independent, original research.

Instructor: C.M. Boyd
Format: Lecture 2 hours, lab 1 plus hour

Prerequisites: Biology 2060 or equivalent and instructor's consent.

Cross-listing: BIOL 4860A

***OCEA 4160B Fisheries Oceanography:** Students who cannot demonstrate competence with fundamental statistical analysis will not be permitted to enrol. Familiarity with the fundamentals of population dynamics, ecology, physical oceanography, calculus, statistics, and computerized analysis is ESSENTIAL. The class will focus on the ecology of marine fisheries (including a consideration of significant advances made in freshwater systems) with emphasis on the biotic and abiotic influences on population dynamics and production. Areas to be covered include reproduction, early life history, feeding, growth, metabolism, mortality, and recruitment variability and forecasting. Emphasis will be placed on how hydrological and meteorological processes influence the above. Some emphasis will also be placed on population and community ecology as well as fishery management techniques and models. The class will place emphasis on the primary literature, current problems and hypotheses, and fruitful research directions, approaches, and techniques.

Instructor: Staff
Format: Lecture 2 hours, tutorial/lab 1 hour

Prerequisites: Biology 2060; Math/Stats 1060 and/or 1070.

Instructor's consent
Cross-listing: BIOL 4369B

OCEA 4170A Introductory Physical and Chemical Oceanography: This class outlines concepts in physical and chemical oceanography with special emphasis on topics most relevant to ocean biology. The ocean as a physical system, water properties, basic dynamical concepts, the forces creating oceanic motion, ocean circulation, shelf and coastal processes. The ocean as a chemical system. Composition of sea water, control of pH and redox potential, nutrient chemistry, trace elements, organic materials, distributions and geochemical cycles.

Instructor: Staff
Format: Lecture 3 hours
Prerequisites: A class restricted to third and fourth-year students. Math 1000A or B, Math 1010A or B, Classic Calculus or equivalent or permission of the instructor

***OCEA 4210A Time Series Analysis in Oceanography:** Much of the data collected in oceanography and other earth sciences are in the form of a time series; measurements of variables as they change with time or place. A powerful way of interpreting and comparing time series is to separate them into contributions in different frequency bands. This class discusses ways in which this can be done, with particular emphasis on applied auto- and cross-spectral analysis, and filtering techniques.

Instructor: K. Thompson
Format: Lecture 3 hours
Prerequisites: Instructor's consent
Cross-listing: STATS 4390A

***OCEA 4230B Biology of Phytoplankton:** The role of phytoplankton as primary producers of organic material in the sea, and as agents of biogeochemical transformations, explored in the context of interactions with physical and chemical oceanographic processes. Emphasis is on the current literature.

Instructor: Staff
Format: Lecture 3 hours, some labs
Prerequisites: Instructor's consent

***OCEA 4280A/5280A Chemical Sedimentology and Early Diagenesis:** The present course aims at a quantitative understanding of the chemistry of sedimentary systems and the changes that occur during early burial history.

Thermodynamic, kinetic and transport models are employed to describe and conceptualize the biological, chemical and physical processes responsible for these modifications. Some topics to be covered include compaction, formation and dissolution of carbonate and siliceous sediments, organic matter degradation and nutrient regeneration, iron and manganese diagenesis and the formation of ferromanganese nodules, and basalt-sediment interactions.

Instructor: B. Boudreau
Format: Lecture 3 hours
Prerequisites: knowledge of physical chemistry/ intermediate calc/Prof's consent

OCEA 4311A/4312B Fluid Dynamics I and II: An introduction to the theory of fluid dynamics, with some emphasis on geophysically important aspects. Topics include: flow kinematics, equations of motion, viscous flow, potential flow and

basic aerodynamics in the first term, and open channel flow, compressible, rotating and stratified flows, hydrodynamic stability, convection and turbulence in the second term. A knowledge of methods of mathematical physics is a desirable prerequisite. Some laboratory experiments on stratified and rotating flows are included in the second term.

Instructor: Staff
Format: Lecture 3 hours
Prerequisites: Intended for first year graduate students in physical oceanography, but graduate students or senior undergraduates in Mathematics or Physics are invited to take it (subject to instructor approval)
Cross-listing: PHYC 4311A, PHYC 4312B

***OCEA 4330B Benthic Ecology:** An advanced level class concentrating on the major problem of benthic ecology, such as how food is supplied to benthic animals, what factors control the structure of biological communities, and how the benthos is related to processes in the sediments. Year-to-year the course content changes, keeping up with current problems of research workers in this discipline.

Instructor: J. Grant
Format: Lecture 3 hours
Prerequisites: Instructor's consent
Cross-listing: BIOL 4866B

OCEA 4331B The History of Oceanography: A one-term course for graduate students and senior undergraduates emphasizing the major developments leading to the present state of knowledge in biological, physical, chemical, and geological oceanography. Events and changes are set in cultural and social contexts. How have scientific forces, institutional developments, and social influences affected the acquisition of knowledge about the oceans?

Instructor: E.L. Mills
Format: Lecture 3 hours
Prerequisites: Instructor's consent
Cross-listing: BIOL 4864B

***OCEA 4380B Marine Modelling:** A graduate level survey of modelling techniques applied to biological-physical problems in oceanography. Lecture material includes: philosophy of modelling, dimensional analysis, parameterization of unresolved processes, numerical representation of ordinary or partial differential equations, model validation and fundamental limits to predictability and frequency domain analysis. Students are given the opportunity to study special topics in the current literature, e.g., prey-predator models, spatial patchiness models, models of the biomass size

spectrum, models of pollutant dispersal, etc. Knowledge of computer programming is helpful but not a prerequisite.

Instructor: Staff
 Format: Lecture 3 hours
 Prerequisites: Instructor's consent

OCEA 4411A Dynamic Meteorology I: The basic laws of fluid dynamics are applied to studies of atmospheric motion, including the atmospheric boundary layer and synoptic scale weather disturbances (the familiar highs and lows on weather maps). Emphasis will be placed on the blend of mathematical theory and physical reasoning which leads to the best understanding of the dominant physical mechanisms.

Instructor: O. Hertzman
 Format: Lecture 3 hours
 Prerequisites: Instructor's consent
 Cross-listing :PHYC 4411A

OCEA 4412B Dynamic Meteorology II: The approach is the same as for 4411A, with emphasis placed on synoptic-scale wave phenomena, frontal motions, and the global circulation. An introduction to numerical techniques and their use in weather forecasting models and studies of climate is included. Additional special topics are covered at the discretion of the instructor.

Instructor: O. Hertzman
 Format: Lecture 3 hours
 Prerequisites: Phys/Ocean 4411A or Instructor's consent
 Cross-listing :PHYC 4412B

OCEA 4500A Atmospheric Physics I: Main topics covered in this class are atmospheric thermodynamics and atmospheric radiation.

Instructor: D.F. Goble
 Format: Lecture 3 hours
 Prerequisites: Instructor's consent
 Cross-listing :PHYC 4500A

OCEA 4510B Atmospheric Physics II: The major topic covered is cloud physics. Other topics include atmospheric optics and acoustics, lightning and radar techniques.

Instructor: D.F. Goble
 Format: Lecture 3 hours
 Prerequisites: Phys/Ocean 4500A or instructor's consent
 Cross-listing :PHYC 4510B

OCEA 4515C Weather Briefing: Weather briefing is intended to develop skills in presenting a coherent and scientifically sound discussion of the current weather using real-time weather maps and data. It is primarily for students in the Meteorology Diploma Programme.

Instructor: G. Lesins, O. Hertzman

OCEA 4520A Introduction to Meteorology: This course provides the student with an understanding of the thermal structure of the atmosphere, air mass and frontal theory, and

weather generating physical processes and their consequences. Other topics include microscale phenomena, local wind systems and applications of meteorology to problems in air pollution control, hydrology and agriculture.

Instructor: Staff
 Format: Lecture 3 hours
 Prerequisites: Instructor's consent
 Cross-listing :PHYC 4520A

OCEA 4530B Introduction to Radiation and Climate: This course provides the student with an understanding of the origin, composition and thermal structure of the atmosphere, and radiative transfer through clear and cloudy atmospheres. There will be some discussion of the atmospheric general circulation, radiative transfer, atmosphere-ocean-biosphere interaction, and climate change.

Instructor: P. Chylek
 Format: Lecture 3 hours
 Prerequisites: Instructor's consent
 Cross-listing :PHYC 4530B

OCEA 4540B Climate Modelling: Topics discussed include: zero, one and 2-dimensional energy balance models, multiple solutions and stability, the diffusive/radiative length scale, stochastic and orbital forcing. Radiative-convective models, 3 dimensional models, predictive equations, general circulation models.

Instructor: W. Hyde
 Format: Lecture 3 hours
 Prerequisites: Instructor's consent

OCEA 4541A Synoptic Meteorology I: This class introduces principles and techniques of meteorological analysis, diagnosis of weather systems and prognosis of system motion and development. A brief review is presented of meteorological instrumentation, observational procedures, codes and analysis techniques essential to the study of the main subject matter. Atmospheric systems and processes are carried out during the tutorial-laboratory period.

Instructor: Staff
 Format: Lecture 2 hours, tutorial-laboratory 3 hours
 Prerequisite: At least one third-year physics class
 Cross-listing PHYC 4540A

OCEA 4550B Synoptic Meteorology II: This class extends the analysis and diagnosis of atmospheric dynamics and weather processes introduced in OCEA 4541A. Modern statistical and computer methods and satellite techniques are discussed. Case studies of atmospheric systems and processes are carried out during the tutorial-laboratory period.

Instructor: Staff

Format: Lecture 2 hours,
tutorial-laboratory 3 hours

Prerequisite: OCEA 4541A

Cross-listing: PHYC 4550B

OCEA 4500B Invertebrate Fisheries and Aquaculture: Subject matter will deal with commercially exploited invertebrates (crustaceans and molluscs) with a heavy emphasis on bivalves. Topics to be covered include: (1) Review of the major invertebrate harvest fisheries (locations, methods, population cycles, fisheries models) (2) Biology and ecology of the Bivalvia (feeding, bioenergetics, growth, and reproduction) (3) Shellfish aquaculture (methods, species, site location, economics). These topics will be covered with respect to the Maritimes as well as non-local fisheries. Course structure will be a mixture of lecture and class discussions, supplemented by visits to aquaculture sites. Course requirements will include a research paper and oral presentations.

Instructors: J. Grant, G. Newkirk, R. Mohn

Format: Lecture/discussion 3 hours

Prerequisites: Biology 2001A, 2060A or B, and 3321R; fundamental knowledge of statistics; permission of instructor

Cross-listing: BIOL 4800B

College of Pharmacy

Location: George A. Burbidge Building,
5968 College Street, Halifax,
N.S. B3H 3J5
Telephone: (902) 494-2378
FAX: (902) 494-1398

Academic Staff, 1992-93

Director and Professor

R. Frank Chandler, BSc Pharm, MSc (Alta),
PhD (Syd)

Emeritus Professors

J. Gordon Duff, BSP, MSc (Seak), PhD (Fla)

Professors

R. Frank Chandler, BSc Pharm, MSc (Alta),
PhD (Syd), Director and Professor
Ingride S. Sketris, BSc(Pharm) (Tor), PharmD
(Minn), MPA (HSA) (Dal)
David K. Yung, BA, BSP, MSc (Seak), PhD
(Alta)

Associate Professors

Isaac Abraham, BPharm, MPharm (UST Kai),
PhD (Neb)
E.I. Butler, BSc(Chem), MSc(Chem),
PhD(Colloid Chem) (Bp)
Patrick S. Farmer, BSP, MSc (Seak), PhD
(Portsmouth)
Mary E. MacCara, BSc(Pharm) (Dal), PharmD
(Minn)
Pollen K.F. Yeung, BSc(Pharm), MSc (Man),
PhD (Seak)

Assistant Professor

Anne Marie Whelan, BSc(Pharm) (Dal),
PharmD (MUSC)

Lecturers

Susan A. Mansour, BSc(Pharm), MBA (Dal),
PhC
Beth Wilson, BSc(Pharm) (Dal), PhC

Externship Administrator

Kathleen A. Shipp, BSc(Pharm) (Dal), PhC

Sessional Lecturers

Susan Beresford, BSc(Pharm) (Dal), PhC
Deborah Burch, BSc(Pharm) (Dal), MBA (Dal)
Bertha E. Etter, BSc(Pharm) (Dal), PhC
A.K. Krumira, BSc Hons (Mosul, Iraq), MSc
Distinction (Reading, PhD) (Murdock)
J. Patrick King, BEd (UPEI), MBA (Dal)
Brenda McBean Cochran, BSP (Seak)
Patricia McCaughan
Jane Parniter, BSc (Pharm) (Dal)
Nadine Wentzell, BSc(Pharm) (Dal), PhC

Joint Appointments

Elizabeth A. Foy, Professional Information
Officer, College of Pharmacy, Pharmacy
Subject Specialist and Information Officer,
WK Kellogg Health Sciences Library.

Honourary Appointments

Derek W. Jones, BSc, PhD (Birm), FICeram,
CChem, FRSC(UK), FADM; Honourary
Professor, College of Pharmacy; Professor
and Head, Division of Dental Biomaterials
Science, Faculty of Dentistry
Janice Irvine Meek, BSc(Pharm) (Dal), Pharm
D (Philadelphia), Consultant Pharmacist
P. Timothy Pollock, BSc, MD, PhD (Western),
Staff Physician, Department of Internal
Medicine, Victoria General Hospital,
Honourary Assistant Professor, College of
Pharmacy
Michael A. Quilliam, BSc (Honors), PhD
(Man); Honourary Adjunct Associate
Professor, College of Pharmacy; Associate
Research Officer, Atlantic Research
Laboratory, NRC.

Special Lecturers

Dawn M. Frail, BSc(Pharm) (Dal), MSc (Dal),
PhC
B. Dillman, BSc(Pharm) (Dal)
Vincent Heighton, Pharm Dip BSc (Dal) PhC
Anne Hiltz, BSc(Pharm) (Dal), PhC
Bonnie Salaman, BSc(Pharm) (Dal), PhC
Roy Steeves, BSc(Pharm) (Dal), PharmD (Fla),
PhC
Wenda MacDonald, BSc (Dal), PhD (Dal),
Poison Control Centre
C. Brian Tuttle, BSc(Pharm) (Dal), MSc (Tor),
PhC
Donna Wheeler-Usher, BSc(Pharm) (Dal),
MSc(Pharm) (Oregon State)

Preceptors (1992)

The pharmacist preceptors listed below
gave their time and expertise to a structured
practical training programme. The programme
is administered by the College with the
support of the Pharmacy Licensing Bodies in
the Maritimes. It requires the third year
students to demonstrate their knowledge and
professional competency in actual practice
situations in community and hospital
pharmacy.

Community Preceptors

New Scotia

Arlene Bailey
Terry Barrett
Paul Belliveau
Lillian Berry
Susan Bowser
Dawn Brake
Maureen Crossman
Jack Davies

James Duncanson
 John Dunder
 Deborah Ellis
 Leelle Ernst
 Catherine Freeman
 Hilda Lamey
 Kelly Lee
 Allison MacDonald
 Janet MacDonald
 Rosemary MacDougall
 John MacNeil
 Joann Meder
 Michala Mansfield
 Michael Mercer
 Cheryl Mitchell
 Mary Mules
 Terrence Ramsey
 William Redden
 Leslie W. Reid
 Mark Reynolds
 Curtis Robertson
 Carlos Rojas
 Richard Theriault
 Andrea Titus
 Gary Vaughn
 Susan Wedlake
 Derek Wentzell
 Alexandra Willson

New Brunswick

Fred Armstrong
 John Breaux
 Fahim Chisht
 Robyn Gay
 Andre Haehy
 Joan Hodgson
 William Kelly
 Stephanie Kelly
 Lisa Kennedy
 Linda Knowles
 Valeri MacDonald
 Donald MacGregor
 Halley MacPherson
 Dennis MacRae
 Eleanor McClume
 Marion Morrison
 Eleanor Murray
 Ronald Ouellette
 Allan Rappoport
 Grant Stoeves
 Ramond Thibeault
 Gary Thorne

Prince Edward Island

Allan Greene
 Robert MacLellan
 Arvin MacNeil
 Ken Ramsey
 Andrea Tweel

Hospital Preceptors

Nova Scotia

Charmaine Cooke
 Patrick Crawford

Michelle Crowe
 Donna Crowell
 Kim Dalton
 Mary Dolg
 Brooke Fulmer
 Karen Gallivan
 Jane Gillie
 Derrick Gray
 Claudia Harding
 Jacqueline Hart
 George Hatcher
 Rosemary Hayter
 Anne Hiltz
 Pauline Hingston
 Jill Inglis
 Kim Kelly
 Audrey Lawrence
 Dennie Leith
 Thomas Maher
 Shelly Mann
 T.A. Marlatt
 Mary Maxner
 Hugh McGinn
 Mary Anne McGinn
 Judy McPhee
 Joseph Napke
 Cindy Offman
 Ardeth Reardon
 Donna Sheve
 Karen Smith
 Emily Somers
 Lynn Steinburg
 Judith Watts

New Brunswick

Natalie Branch
 Susan Button
 Roy Dobson
 Douglas Doucette
 Jacqueline Jackson
 Gordon Kane
 Andre Martin
 Kathleen McLean
 Claudette Robicheaud
 Wade Simpson
 Roy Stoeves
 Moira Wilson
 Ann Yurochesyn

Prince Edward Island

Wendy Cooke
 Bonnie Cornish
 Beverley Martin
 Jim Thorkelson

Clinical Clerkship

The pharmacists listed below have given their time and expertise to the Clinical Clerkship during 1991. During the Clerkship the fourth year students attend conferences and clinical drug rounds at participating hospitals and learn to apply clinical pharmacy principles.

Camp Hill Hospital

Bryan Davis
 Claudia Harding
 Audrey Lawrence
 Cindy Offman
 Iain Smith
 Donna Wheeler-Usher
 Stephanie Young

Canadian Forces Hospital (Stadacona)

Roxanne Kearne
 Lisa McDougall

Grace Maternity Hospital

Melanie Holmes
 Shelley Richard

Halifax Infirmary/Camp Hill Medical Center

Bernadette Cameron
 Charmaine Cooke
 Jane Gillis
 Jim Godin
 Laura Hicke
 Jill Inglis
 Gail Tuttle
 Terri Zinok

Izaak Walton Killam Hospital For Children

Wanda MacDonald
 B. McCully

Nova Scotia Hospital

Catherine Bennett
 Brian Dillman
 Nancy Harris

Saint John Regional Hospital

Michele Arthur
 Leonard Cassidy
 Roy Steeves

Valley Health Services

Shelagh Campbell-Palmer
 Sandy Piggott

Victoria General Hospital

Sylvia Aldrick
 Roberta Baker
 Debbie Burgher
 Rose Dugandzio
 Charlene Houshmand
 Jennifer Lowerson
 Casey Montgomery
 Lorraine Parkin
 Ingrid Sketrie
 Susan Smith
 Pam Veysey

Moncton Hospital

Janet Beyer
 Julie Levesque
 Karen McCurdy-Thompson
 Lauza Saulnier

Sydney City Hospital

Kim Dalton

Karen Gallivan**Lawton's Drug Store**

Sue Scribner

Sydney Community Health Center

Theresa Johnstone
 Donna Shave

Glouce Bay Community Hospital

André Boudreau
 Kelly MacIsaac

Cape Breton Hospital

Sharon Sobol

Oromocto Public Hospital

Douglas Doucette

Dr. Everett Chalmers Hospital

Natalie Branch
 Wanda Copp
 Roy Dobson
 Billi Jo Jones
 Ian MacDonald

South Shore Regional Hospital

Mary Doig

History

Formal pharmacy education in the Maritime provinces began in 1908, with evening classes in pharmacy and chemistry conducted in the Nova Scotia Technical College. Success of these classes encouraged the Nova Scotia Pharmaceutical Society to establish the Nova Scotia College of Pharmacy in 1911. The College was affiliated with Dalhousie University in 1912.

The New Brunswick Pharmaceutical Society and the Prince Edward Island Pharmaceutical Association were admitted to affiliation with the College in 1917 and 1950, respectively. With the affiliation of the former society, the College was renamed the Maritime College of Pharmacy.

In 1961, the Maritime College of Pharmacy was admitted into Dalhousie University as the College of Pharmacy, a constituent part of the new Faculty of Health Professions. A four-year baccalaureate programme was introduced.

In 1966, a Master's programme was established, followed by a Doctor of Philosophy programme in 1977.

In 1972, a twelve month pharmacy residency programme was initiated by Camp Hill Hospital in cooperation with the College of Pharmacy. Programmes were initiated at the Halifax Infirmary in 1974, at the Victoria General Hospital in 1981 and at the Saint John Regional Hospital in 1982.

In the fall of 1968, the College of Pharmacy moved into the George A. Burbidge Pharmacy Building. This building, the former Medical Sciences Building was renamed in honour of the first Dean of the College, in recognition of his contribution to pharmacy education in the Maritimes. Present facilities accommodate approximately 260 undergraduate and 12 graduate students.

College of Pharmacy Regulations

All students are required to observe the University and Academic Regulations as described in this calendar.

There is, within the College of Pharmacy, a Committee on Studies that assesses the academic performance of each student in the College.

Academic Requirements

1. A student must obtain a grade of at least C (C- is not acceptable) in each professional class for that class to be counted as credit for the degree or as a prerequisite for another professional class. A student who earns a grade of less than C in a professional class but is still eligible to continue in the College of Pharmacy must repeat that class until a grade of C or better is obtained.
2. Any student failing a professional class for the second time must withdraw from the College of Pharmacy.
3. Students are required to attend class to the satisfaction of their instructors. Attendance is mandatory in laboratory, tutorial and seminar classes and externship programmes offered by the College of Pharmacy unless otherwise specified by the instructor.
4. When the work of a student becomes unsatisfactory or his/her attendance irregular, the student may be required to discontinue and be excluded from the class concerned.
5. If laboratory work or assignments are not completed in a satisfactory manner in any class or classes, credit for the class is withheld until all work has been satisfactorily completed.
6. In the case of failure in the laboratory portion of a pharmacy class, the laboratory, together with the corresponding lecture portion of the class, must be repeated.
7. As an academic requirement, students are assessed in each year on their aptitude and fitness for the profession of pharmacy. A student who, in the judgement of the faculty, fails to attain a satisfactory standard in the

assessment may be retired from the College of Pharmacy.

8. Failure in Pharmacy 3000B (PTP) results in the student having to repeat the course at its next regular offering.

Externship Programmes

Students may be required to complete externships programmes (currently Pharm 3000B and clerkship programme) outside the Halifax/Dartmouth area. Students are responsible for any travel and living expenses associated with externship programmes.

Grading System

College regulations relating to GPA apply to students whose initial registration in the College was in the fall of 1990 or earlier (consult calendar of appropriate year). Students entering in the fall of 1991 and beyond will be governed by revised regulations found in the Academic Regulations section of this calendar.

1. Credit Hours

For classes offered by the College of Pharmacy, one credit hour is defined as one hour of lecture per week per term, or three hours of laboratory per week per term.

2. Requirements for Degree

To satisfy the requirements for the degree of Bachelor of Science in Pharmacy a student must:

- accumulate at least 134 credit hours (or its equivalent for transfer students), with an overall (cumulative) GPA of at least 2.00 in the prescribed classes; and
- accumulate at least 104 credit hours (or its equivalent for transfer students), with an overall (cumulative) GPA of at least 2.00 in the prescribed professional classes.

Note: For lists of prescribed and professional classes see the sections "Classes of Instruction" and "Prescribed Classes."

Reassessment of a Grade

See Academic Regulation 18.7. In all cases of reassessment, the calculations used to arrive at the final grade will be checked. In those classes where the student has had ample time to consider marks obtained for all work done, except for the final examination, reassessment in such classes shall be done on the final examination only. For other classes, a reassessment shall include the results from all work not previously available to the student during the term.

Appeals

Students wishing to appeal a decision based on Academic Regulations should request from the Director the appeal procedure.

Programmes Offered

The College of Pharmacy offers a four-year programme leading to the degree of Bachelor of Science in Pharmacy (BSO Pharm), one- or two-year programmes of study and research leading to the degree of Master of Science (MSO), and a programme of advanced study and research leading to the degree of Doctor of Philosophy (PhD).

The undergraduate programme, which admits 66 students into the first professional year, has a patient-oriented curriculum integrating clinical pharmacy with the pharmaceutical sciences. This programme is more completely described in the following pages. More information on the graduate degree programmes may be obtained from the Faculty of Graduate Studies Calendar.

The College participates with the Camp Hill Medical Center, The Victoria General Hospital, and The Saint John Regional Hospital in twelve-month post-graduate pharmacy residency programmes. These programmes orient the resident to various aspects of institutionalized health care with emphasis placed on drug therapy in patient care. They provide an opportunity for the residents to use professional judgement in evaluating drug information, drug therapy and in communicating with members of the health professions and with patients. A certificate is issued to candidates successfully completing pharmacy residency programmes that are accredited with the Canadian Hospital Pharmacy Residency Board.

The Pharmacy Library, housed on the first floor of the Burbridge Building, is the only branch library of the W. K. Kellogg Health Sciences Library located next door in the Sir Charles Tupper Medical Building. Holdings in the Pharmacy Library include several thousand bound volumes, microforms, and approximately 200 serial subscriptions relating to pharmacy and allied sciences. In addition, there are three pharmacy-related CD-ROM databases available for end user searching.

Career Opportunities

Pharmacy is a health science concerned with many aspects of the use of drugs for the health care of the patient. This includes the preparation of suitable materials for use as medicines from natural and synthetic sources, the compounding of drugs and the

dispensing of suitable medication, the taking of medication histories, keeping patient drug profiles, counselling patients on their prescribed medication, educating patients on their self-medication habits, monitoring drug interactions, adverse drug reactions and patients' compliance with their drug treatment, and the provision of information on drugs to patients and other health professionals.

Pharmacy graduates have a wide range of career opportunities. The majority enter community pharmacy practice. Hospital pharmacy also provides an interesting challenge for pharmacists, particularly in view of their expanding role within the clinical setting. The pharmaceutical industry provides opportunities for pharmacists in the fields of sales, production, research and quality control.

The increased role of federal and provincial governments in public health has provided opportunities for pharmacists in analytical laboratories and in administrative positions as government inspectors and health supplies officers. Opportunities may also be available in universities as teachers and researchers.

A Bachelor of Science in Pharmacy is necessary for those who wish to practice as pharmacists. For those who wish to enter research or teaching, a Master of Science degree or further postgraduate study is usually required.

Practice Requirements

1. Licence in Pharmacy

The College of Pharmacy, being purely educational, has no jurisdiction in matters relating to licensing or to registration as a Pharmaceutical Chemist (Pharmacist). These functions are entirely under the control of the provincial licensing body concerned. A period of practical training or apprenticeship is required before a graduate in pharmacy is licensed as a pharmacist. Information regarding licensing or registration in each province may be obtained from the respective provincial society: the Registrar of the New Brunswick Pharmaceutical Society, Heritage Court, Suite 204, 95 Foundry Street, Monoton, N.B., E1C 5H7; the Registrar of the Prince Edward Island Board of Pharmacy, PO Box 1084, Charlottetown, P.E.I., C1A 7M4; or the Registrar of the Nova Scotia Pharmaceutical Society, 1526 Dresden Row, PO Box 3363, Halifax South Postal Station, Halifax, N.S., B3J 3J1.

2. Pharmacy Examining Board of Canada (PEBC)

The Pharmacy Examining Board of Canada was created by Federal Statute on December 21, 1963, to establish qualifications for pharmacists acceptable to participating pharmacy licensing bodies. The Board provides for annual examinations and issues a certificate to the successful candidate which may be filed with a Canadian provincial licensing body in connection with an application for licence to practice pharmacy under the laws of that province. Baccalaureate graduates from the College of Pharmacy are eligible to write these examinations. Successful completion of these examinations is a prerequisite to licensure for Dalhousie graduates in all provinces except Prince Edward Island. Information relative to the dates of examinations, application forms, etc., may be obtained through the Director's Office, College of Pharmacy.

Student Pharmacy Society

The basic aims of the Student Pharmacy Society are to promote a closer liaison with the other societies on campus, to give the pharmacy students a strong position with regard to Student Council activities, to provide a means of communications between students and their respective licensing bodies in the Maritimes, and to provide an organizational body which plans and finances the various unique Pharmacy Society activities.

Membership in the Pharmacy Society includes membership in the Canadian Association of Pharmacy Students and Interns and representation in the Canadian Pharmaceutical Association.

Prescribed Classes

The curriculum of the College of Pharmacy is undergoing a major revision, commencing in 1992/93. Thus, the incoming first year class will receive instruction under the new curriculum, while the three senior classes will continue under the previous curriculum.

All classes offered are within the normal academic year with the exception of Pharmacy 3000B. Pharmacy 3000B includes a practical training programme which the student must complete on a full-time basis in a pharmacy, normally during the month of May following the third year of study.

The following are descriptions of classes which are expected to be offered in the academic year 1992-93.

Year 1: Pharmacy 1110R, Pharmacy 1700A, Anatomy 0101C, Microbiology 2020B, Chemistry 2400R, Statistics 1080A or B, and one additional full

credit or two half-credits in non-science elective(s).

Year 2: Pharmacy 2110A, Pharmacy 2120B, Pharmacy 2130R, Pharmacy 2500B, Chemistry 2400R, Microbiology 3020R and Physiology 2010R.

Year 3: Pharmacy 3000B, Pharmacy 3100B, Pharmacy 3250A, Pharmacy 3300C, Pharmacy 3310A, Pharmacy 3500R, Biochemistry 3101A, Biochemistry 3102B and pharmacology 3470R.

Year 4: Pharmacy 4100C, Pharmacy 4500R, Pharmacy 4700A, 4710B, Pharmacy 4930B, Pharmacy elective and an approved elective.

Classes Offered

Professional Classes

PHAR 1110R - Introduction to Pharmacy: An introduction that includes a description of the role and the responsibilities of a pharmacist in practice, the prescription, pharmaceutical calculations, an introduction to communication skills, an introduction to drug information, and a programmed text approach to medical terminology. The major topics are dosage forms and compounding and dispensing techniques. Laboratory work concentrates on compounding and dispensing of examples of the dosage forms discussed in class. Dispensing lab and communication skills seminars are compulsory parts of this class. Failure to complete the lab or the communications portion will result in a grade of incomplete on the transcript.

Credit Hours: 6

Instructor: B. Wilson

Format: lecture 3 hours; lab 3 hours or seminar 2 hours; tutorial 1 hour

PHAR 1700A - Pharmacy Administration I: An introduction to the history of Pharmacy, pharmacy organizations, law, and business management.

Instructor: N. Wentzell

Format: Lecture 3 hours

Enrolment: Limited to pharmacy students

PHAR 2110A - Liquid Dosage Forms: A continuation of Pharm 1100R dealing with the compounding and dispensing of liquid dosage forms. Introductions to sterile preparations and to drug information are also included. Laboratory work concentrates on compounding and dispensing examples of the dosage forms discussed in class. Dispensing lab is a compulsory part of this class and failure to complete the lab will result in a grade of incomplete on the transcript.

Credit Hours: 2

Instructor: B. Wilson

Format: Lecture 2 hours; lab 3 hours; tutorial 1 hour

Prerequisite: Pharm 1100R

PHAR 2120B - Biopharmaceutics: The course deals with the application of physicochemical and physiological factors in the design and delivery of drug dosage forms. Topics include: drug design and drug development, routes of drug administration, membrane structure and transmembrane transport of drug molecules, physicochemical and physiological factors in drug absorption, distribution and elimination, biopharmaceutical consideration of new drug delivery systems.

Credit Hours: 2

Instructors: I. Abraham

Format: Lecture 2 hours

Prerequisites: Pharm 1110R

Corequisites: Pharm 2130R

PHAR 2130R - Physical Pharmacy:

Fundamentals: Properties of solutions: non electrolytes, electrolytes. Isotonic solutions. Ionic equilibria. Buffers. Solubility and distribution. Kinetics - fundamentals, chemical stability of drugs. Accelerated stability analysis. Diffusion. Dissolution of drugs. Rheology. Interfacial phenomena: (a) surface tension, wettability; (b) absorption at various interfaces; (c) electrokinetic phenomena. Colloid systems: macromolecules, association colloids and dispersion colloids. Kinetic stability of dispersions, drug preparations. Coarse dispersions: suspensions, emulsions. Physical properties of drugs - measuring methods.

Credit Hours: 6

Instructor: E.V. Butler

Format: Lecture 3 hours, 1st term; lecture 2 hours, lab 3 hours/2nd term; tutorial 1hr/week

Prerequisites: Chem 1140R, Stats 1060A, Pharm 1110R and Chem 2400R

Corequisites: Pharm 2120B

Recommended: Continuous study following the guidelines distributed for each topic. Participation in tutorials and small group classes

PHAR 2310A - Pharmaceutical Analysis:

Topics include gravimetric, volumetric, chromatographic, and spectrophotometric methods of analysis of drug products, and principles and methodology of drug product quality assurance.

Credit Hours: 3

Instructor: D.K. Yung

Format: Lecture 2 hours, lab 3 hours

Prerequisite: Chem 2400R

Recommended: Review of general chemistry

PHAR 2500B - Introduction to Therapeutics:

An introduction to the therapeutic and prophylactic use of over-the counter (OTC) and prescription drugs. Patient counselling is emphasized with knowledge of drug products, disease states, and non-pharmacological therapy.

Credit Hours: 2

Instructors: TBA

Format: Lecture 2 hours, tutorial 1 hour

Prerequisite: Anatomy 0101A

Co-requisite: Physiology 2021B, Microbiology 3020R

PHAR 3000B - Practical Training Programme:

A structured practical training programme consisting of five consecutive weeks to be completed in May, after the third year academic programme. This programme studies prescription compounding and dispensing in both community and hospital pharmacies and is conducted in the presence of a practising pharmacist preceptor. As well, nonprescription drugs and accessories, patient counselling and communications, laws and regulations, management and administration, are all stressed. Students are responsible for finding their own practice sites for this programme.

Credit Hours: 0

Instructor: K. Shipp

Format: 5 weeks (175 hours)

Prerequisite: Completion of third year

PHAR 3100B - Compounding and Dispensing:

This class is concerned with the proper compounding and dispensing of pharmaceutical products, and professional communication techniques.

Credit Hours: 2

Instructor: S. Beresford

Format: Lecture 1 1/2 hours, lab 3 hours

Prerequisite: Completion of second year

PHAR 3250A - Pharmacokinetics: Course is

designed to acquaint students with the quantitative aspects of drug absorption, distribution, metabolism and excretion.

Topics are related to the application of the principles of the one- and two-pharmacokinetic models in the analysis of drug concentration-time data in body fluids and tissues after single and multiple doses.

Credit Hours: 2

Instructor: I. Abraham

Format: Lecture 2 hours

Prerequisites: Pharm 2120B, Pharm 2130R

Co-requisite: Pharm 3470R or 3480R

PHAR 3300C - Medicinal Chemistry:

Applications of the content of areas of chemistry to organic medicinal agents, and the design, chemistry, therapeutics, and pharmacological action of organic compounds used in medicine and the correlation of physicochemical properties and physiological action.

Credit Hours: 5
Instructors: D.K. Yung, P.S. Farmer
Format: Lecture 2 hours, lab 3 hours
 2nd term
Prerequisite: Chem 2400R, Chem
 2310A/3310A

PHAR 3310A - Pharmaceutical Analysis:
 Topics include gravimetric, volumetric, chromatographic, and spectrophotometric methods of analyses of drug products, and principles and methodology of drug product quality assurance.

Credit Hours: 3
Instructor: D.K. Yung
Format: Lecture 2 hours, lab 3 hours
Prerequisite: Chem 2400R
Recommended: Review of general chemistry

PHAR 3500R - Therapeutics I: Therapeutic and prophylactic use of prescription and OTC drugs are discussed. Patient interviewing and counselling are emphasized, along with knowledge of drug products and disease states.

Credit Hours: 9
Co-ordinator: A.M. Whelan
Instructor: Staff
Format: Lecture 3 hours, seminar 1 hour
Prerequisite: Pharm 2500B
Co-requisite: Pharm 3250A, Pharm 3100B, Micro 3020R and Phool 3470R or 3480R

PHAR 4000R - Pharmaceutical Investigation: Library, laboratory, clinical and/or field investigations related to an area in pharmacy, carried out by an individual (preferable) or a small group of students under the supervision of one or more faculty members. Presentation of seminars on the completed project is required. A written report must be submitted. A paper or a presentation which is prepared for this class may not be submitted for credit in any other class.

Credit Hours: 6
Coordinator: E.V. Butler
Instructor: Staff
Format: 6-8 hours of independent study per week
Prerequisites: Approval of the project by the Committee on Studies before registration in the class. The project proposal should be presented for consideration before the end of the previous academic term if possible.

PHAR 4010A, 4020B, 4030C - Directed Study in Pharmacy: For a description of these half classes, see the full class Pharm 4000R.

Credit Hours: 3
Coordinator: E.V. Butler
Instructor: Staff

Format: 6-8 hours of independent study per week for Pharm 4010A and 4020B. 3-4 hours of independent study per week for Pharm 4030C.

Prerequisites: Approval of the project by the Committee on Studies before registration in the class. Projects should be presented for consideration before the end of the previous academic term.

PHAR 4100C - Pharmacotics: Class deals with topics in clinical pharmacokinetics, radiopharmaceutics and drug interactions. Topics in clinical pharmacokinetics include the use of pharmacokinetic principles in the management of patients with renal and hepatic malfunction, pharmacokinetics of pharmacological responses and non-linear pharmacokinetic systems, geriatric and paediatric pharmacokinetics.

Credit Hours: 5
Instructors: I. Abraham, A. Hiltz
Format: Lecture 2 hours 1st term, 1 hour 2nd term
Prerequisite: Pharm 3250A

PHAR 4130A/5130A - Physicochemical/Industrial Aspects of Controlled Release Drug Delivery: An introduction: New trends in drug delivery: sustained, controlled, topical and targeted drug delivery. Application areas of controlled release of substances. Scale-up and technology transfer procedures and related problems, in general. History of the development of new delivery systems. How to do literature search? (E. Foy, Librarian)

Liposomes: types of liposomes, methods of preparation, special influencing parameters of liposomes on drug encapsulation, release. Technological problems in liposome production. Application areas. **Polymers** in drug delivery: selections of polymers - biodegradable and non-biodegradable polymers. Bioadhesive polymers, multi-layered polymeric compositions (patch). Microcapsules - microspheres, nanoparticles. Special parameters of polymers influencing drug delivery. Technological problems. Application areas. **Other** drug delivery systems.

Physical/chemical properties and specific surface characteristics of drugs and vesicles; their effect on drug delivery. Selected methods for measuring these parameters (theory and lab demonstration).

Credit Hours: 3
Instructor: E.V. Butler
Format: lecture 1 h/week, seminar/workshop 1 h/week, lab/workshop 3 hae/week

during the last two weeks of the term.

Prerequisites: Phar 2120B, 2130R, 3250A, Chem 2400R, Stat 1060A or equivalent for Pharmacy students. For students with a background other than pharmacy; consent of instructor.

Enrollment: Limited to 15 students.
Note: The course is given every other year. During the alternate years, however, request for course will be considered.

PHAR 4150A or B - Computer Dispensing and Prescription Management: Students fill a selection of difficult prescriptions for a patient base with a variety of allergies/disease states/drug plans, to best utilize computer menu options. Also covered are inventory control/management reports/nursing home programs and auxiliary patient counselling and drug interaction programmes.

Credit Hours: 3
Instructor: B.P. Etter
Format: lecture 3 hours, lab 5-6 hours
Prerequisite: PHAR 3100B or instructor's consent

PHAR 4230A - Dermopharmacy: Topics include skin diseases and topical therapy.

Credit Hours: 3
Instructor: TBA
Format: Lecture 2 hours
Prerequisite: Consent of instructor

PHAR 4250B/5250B - Advanced Pharmacokinetics: Course is designed for students with research career interests in pharmacokinetics, pharmaceutical dosage form development, clinical pharmacology, drug metabolism and toxicology.

Topics include application of Laplace Transforms in the solution of linear mammillary compartmental models, physiologically-based (perfusion) models, drug absorption models, concept of drug distribution and clearance, noncompartmental analyses of pharmacokinetic data based on statistical moment theory; nonlinear pharmacokinetic; absorption kinetics of sustained-release medications.

Credit Hours:: 3
Instructor: I. Abraham
Format: Lecture 2 hours
Prerequisites: Pharm 3250A, Pharm 4100C, Math 2000R or consent of instructor

Note: The course is given every other year, check with the College.

PHAR 4330B - Herbal Remedies: Herbal remedies, "health foods", and pharmaceutical agents of plant origin are examined with respect to history, traditional usage,

constituents, pharmacology and toxicology. An introduction to the chemistry, pharmacology and toxicology of the major plant constituents is presented. The course emphasizes safety and efficacy of herbs and formulated herbal products.

Credit Hour: 3
Instructor: R.F. Chandler
Format: Lecture 3 hours
Prerequisite: Consent of instructor
Recommended: Some knowledge of organic chemistry, human physiology and pharmacology is strongly recommended.
Enrollment: Limited to 20 students, with preference to senior pharmacy students.

PHAR 4340C - Drug Design: The increasing role of biochemical knowledge in lead generation in drug design is emphasized, followed by consideration of available methods for lead exploitation. The subject is studied by reviewing examples of drug discovery.

Credit Hours: 3
Instructor: P.S. Farmer
Format: Seminar 2 hours 1st term, term paper 2nd term
Prerequisites: Instructor's consent
Enrollment: min 2, max 10 students

PHAR 4350A - Medical Biotechnology: An introduction to biotechnology fundamentals and their application to medical and pharmaceutical therapeutics and diagnostics.

Credit Hours: 3
Instructor: A.K. Kirumira
Format: Lectures 3 hours, some demonstrations
Prerequisite: BIOC 3101A and 3102B, PHAC 3470R

PHAR 4500R - Therapeutics II: A discussion of the application of pharmaceutical sciences to various diseases, pharmaceutical care, therapeutic use of drugs and drug induced disease is presented. Emphasis is placed on self-directed learning. Case study seminars and clerkship experiences are conducted in participating hospitals in conjunction with instruction and application of clinical pharmacy principles.

Credit Hours:: 13
Co-ordinator: I. Sketrie
Instructor: Staff
Format: lectures 6 hours, 1st term, 4 hours 2nd term, case study seminars (2 hours/week), workshops and a clerkship experience
Prerequisites: BIOC 3101A and 3102B, Phac 3470R or 3480R, Pharm 3500R and Pharm 3250A consent of instructor.

Enrolment: Limited to Pharmacy students in the final year of the programme.

PHAR 4550B - Pharmacy Home Health Care: Topics include operation of a pharmacy-based home health care centre and the use of durable medical equipment, surgical supplies and appliances, health supports and orthotic fittings, home diagnostics, electromedicals, sports medicine, incontinence/urologicals, and nutritional support.

Credit Hours: 3
Instructors: TBA
Format: Lecture 3 hours
Prerequisite: Consent of Instructor
Co-requisite: Pharm 4500R

PHAR 4700A - Pharmacy Administration IA: This course is intended to provide introductory business training to prepare the student to manage a retail or hospital pharmacy. Students will be exposed to financial analysis, human resource management, marketing, organizational behaviour and decision making.

Credit Hours: 3
Instructor: P. King
Format: Lecture 3 hours
Prerequisite: Pharm 1700B

PHAR 4710B - Pharmacy Administration IB: Consideration of socioeconomic factors that affect the practice of Pharmacy. A review of ethics, standards of practice and pharmacy legislation, followed by student presentations on current socioeconomic topics. Each presentation is evaluated by a panel of students and practising pharmacists.

Credit Hours: 3
Co-ordinator: P. King
Format: Lecture 3 hours

PHAR 4800R - Hospital Pharmacy: Topics include the organization and management of a hospital pharmacy department and the specialty areas of drug distribution, intravenous admixture services, handling antineoplastic drugs, total parenteral nutrition, total nutrient admixtures, quality assurance programmes and drug information services.

Credit Hours: 6
Instructors: TBA
Format: Lecture 2 hours, lab 2 hours
Prerequisite: Successful completion of third year pharmacy classes
Enrolment: Limited to 16 students, consent of instructor

PHAR 4900B - Drug Information: Topics include sources of drug information, how and when these sources should be used and comparisons of the information found in each, formulating and communicating responses to drug information requests, evaluation of drug literature, drug utilization

review, evaluation of drug advertisements and research methods.

Credit Hours: 3
Instructors: M. MacCarr, I. Sketris
Format: Lecture 3 hours, visitations to local drug information centres
Prerequisite: PHAR 3500R, Phool 3470R or 3480R
Corequisite: PHAR 4500R
Enrolment: limited to 16 students, instructor's consent

PHAR 4910/5910A or B - Advances in Drug Metabolism and Disposition: Topics include methods for isolation, quantitation, and characterization of drugs and their metabolites in biological samples, immunoassays and their applications, kinetics and dynamics of drugs and their metabolites and their clinical relevance, cardiovascular system in health and disease, pharmacokinetics and pharmacodynamic modelling.

Credit Hours: 3
Instructors: P. Yeung, M. Quilliam, G. Klassen, and T. Pollek
Format: Lecture 2 hours
Prerequisite: Bloo 3101A and 3102B, Phool 3470R or 3480R, Pharm 3500R, Pharm 4930B, or instructor's consent

PHAR 4930/5930B - Introductory Drug Metabolism and Toxicology: Topics include chemical and biochemical aspects of drug metabolism, factors influencing drug metabolism, toxicity related to drug metabolism, treatment of poisoning, drug disposition and aging, forensic toxicology, toxicological testing methods and toxic agents.

Credit Hours: 2
Instructor: P. Yeung
Format: Lecture 2 hours
Prerequisite: Bloo 3101A and 3102B, Phool 3470R or 3480R, Pharm 3500R, Pharm 3300C, Pharm 3310A or consent of the instructor.

PHAR 4950B (Nurs 4800B/HE 2250B/PT 3090B) - Interdisciplinary Course in Human Nutrition: See Nurs 4800B for description of class.

Credit Hours: 3
Instructor: E. Lambie (Nursing)
Format: Lectures 3 hours
Prerequisite: Biol 1000R or consent of instructor

PHAR 4960A - An Interdisciplinary Approach to Gerontology: See HLTH 4900A for description of class.

Credit Hours: 3
Instructor: B. Kaddy (Nursing)
Format: Lecture 3 hours

Cross-listing: HEED 4498A, HLTH 4900A, LEIS 4498A, OCCT 4417A, PHSE 4498A, PHYT 4300A, SOSA 2060A

PHAR 4970B - An interdisciplinary approach to Gerontology: See HLTH 4910B for description of class.

Credit Hours: 3

Instructor: TBA

Format: Lecture 3 hours

Cross-listing: HEED 4499B, HLTH 4910B, LEIS 4499B, OCCU 4418B, PHSE 4499B, PHYT 4901B

HLTH 3000B - An Interdisciplinary Approach to Health Promotion: Intra- and interdisciplinary trends in the conceptualization, empirical investigation and practical implementation of health promotion will be examined. Students will consider historical, present and future perspectives of specific health promotion issues. Learners will have opportunities to develop skills in analyzing factors influencing the delivery of health promotion within the Canadian health care system. The contribution of different health professions to the study of health promotion will be assessed and the effectiveness of a teamwork approach will be evaluated.

Credit Hours: 3

Coordinator: TBA

Instructor: Staff

Format: Lecture 2 hours

Prerequisites: Consent of Coordinator

PHAR 4570A or B - Pharmacology of Drug Abuse: The education objectives of this class are to extend the student's knowledge of the pharmacology of drugs of abuse, to enable the student to develop an insight into the biochemical mechanism and consequences of abuse, and to develop in the student an appreciation of the pharmacological basis for the use of drugs during rehabilitation.

Credit Hours: 3

Instructor: G.M. McKenzie

Format: Lecture 2 hours

Prerequisite: Pharmacology 3470R

ANAT 0101C - Human Anatomy: Taught by the Department of Anatomy and designed exclusively for students in the Health Professions and Dental Hygiene.

Credit Hours: 3

Instructor: TBA

Format: Lecture 2 hours

BIOC 3101A - Biological Chemistry for Students of Pharmacy: Students will first be introduced to the structures and functions of proteins and nucleic acids, including an outline of the topic of genetic engineering. Next, the phenomena of enzymic catalysis will be examined in some detail. Finally, the

topic of biological membrane structure and the chemical forms of energy storage will be explored.

Credit Hours: 3

Instructor: D.W. Russell

Format: Lecture 3 hours, lab 2 hours, tutorial 1 hour

Prerequisite: Chem 2400R

Note: BIOC 3101A is a prerequisite for BIOC 3400B (a fourth year elective).

BIOC 3102B - Metabolism for Students of Pharmacy: The class, using the chemical background gained in Bioch 3101A, will examine the generation, storage, liberation, and uses of biological energy.

Credit Hours: 3

Instructor: D.W. Russell

Format: Lecture 3 hours, lab 2 hours, tutorial 1 hour

Prerequisite: Bioch 3101A

PHYL 2010R - Human Physiology: A class dealing with the physio-chemical basis of the physiological processes in man.

Credit Hours: 6

Co-ordinator: N. Morgunov

Instructor: Staff

Format: Lecture 3 hours, tutorial 1 hour

Prerequisite: ANAT 0101C

MICR 2020B: This class is geared to students in pharmacy and in other health-oriented curricula. It provides a brief introduction of microbial structure, physiology, and genetics in relation to microbial pathogenesis. General concepts and practices of sterilization and disinfection, antibiotics, and immunity will be examined with emphasis on mechanism of action. Bacterial, fungal, parasitic, and viral pathogens of medical importance will be discussed according to the mode of entry, transmission, clinical features, prevention, and chemotherapy. Laboratory sessions using demonstration and/or experimentation are designed to complement the lectures and to provide a practical appreciation in the isolation, identification, cultivation, and control of microorganisms.

Instructor: S.H.S. Lee

Format: lecture 3 hours, lab 3 hours

Prerequisite: BIOL 1000R or instructor's consent

PHAC 3470R - The Influence of Chemical Agents on Living Organisms: An introduction to the actions of drugs on physiological and biochemical functions of man and lower animals. The basic mechanisms of actions and structure-activity relationships of various groups of pharmacological agents are stressed and wherever possible, discussed at the molecular and macro-molecular level of cell organization. Factors influencing the absorption, distribution, biotransformation,

and excretion of drugs are discussed, as are potential uses.

Credit Hours: 6

Coordinator: G. McKenzie

Instructor: Staff

Format: Lecture 3 hours

Other Prescribed Classes

Note: For class descriptions of the following classes, see under the respective departmental sections of the Science segment of this calendar.

CHEM 2400R - Introductory Organic Chemistry

STAT 1060A or B - Introductory Statistics for non-Mathematicians

Electives

The first year elective may be any non-science full credit class or two non-science half classes. The student should discuss the available electives with his or her faculty counsellor. Electives for the fourth year of study must be approved by the Committee on Studies.

Philosophy

Location: 1400 Henry Street, Halifax, N.S.
Telephone: (902) 494-3810
Fax: (902) 494-2178

Chair

R.M. Martin

Undergraduate Advisors

N.C. Brett
 S.A.M. Burns
 S. Sherwin
 T. Tomkow

Emeritus Professors

D. Braybrooks, BA (Harv), MA, PhD (Corn), FRSC
 R.P. Puccetti, BA (Ill), MA (Tor), Dكتور de l'Université de Paris (Sorbonne)

Professors

S.A.M. Burns, BA (Acadia), MA (Alta), PhD (Lond)
 R.M. Campbell, BA (Harv), PhD (Corn)
 W.F. Hare, BA (Lond), MA (Leic), PhD (Tor), (Major appointment in Education)
 R.M. Martin, BA (Col), MA, PhD (Mich)
 P.K. Sohotoh, PhD (Waterloo)
 S.B. Sherwin, BA (York), PhD (Stanford)

Associate Professors

N.C. Brett, BA (New Hampshire), MA, PhD (Waterloo)
 D. MacIntosh, BA (Queen's), MA (Waterloo), PhD (Tor)
 T. Tomkow, BA (SFU), PhD (Cantab)
 T. Vinol, BA (Tor), MA, PhD (Pitts)

Assistant Professors

S. Campbell, BA, MA (Alta), PhD (Tor)
 K. Vihvelin, BA (Dal), MA (Oxon), LLB (Dal), PhD (Cornell)

Adjunct Professors

M. Campbell, PhD (Waterloo)
 A. Kernohan, SB (MIT), MSc (Tor), MA (Dal), PhD (Tor)

Beginning in Philosophy

There are many different ways of beginning in philosophy. The Dalhousie Philosophy Department offers three sorts of classes for beginners: (1) general survey introductions, which will give you a taste of a variety of questions and answers; (2) introductions to special areas; (3) logic, which is the study of the theory and techniques of good reasoning. Students wishing to major in philosophy are

encouraged to begin with introduction to Philosophy (either PHIL 1000R, or PHIL 1010R, or PHIL 2040A or B, or PHIL 2050A or B) in which a wide range of philosophical issues is discussed. But any student in any year may begin philosophy with a class that has no prerequisites. These include the 1000-level classes and many of the classes at the 2000-level. Any of these classes provides the student with a good introduction to philosophical thinking. Choose the class that best suits your interests - it's not necessary to start with a general survey. Some 2000-level classes have prerequisites which can be met either by a philosophy class or a class in another relevant discipline. The King's College Foundation Year satisfies the requirement of a previous philosophy class. Classes at the 3000-level and beyond usually have further requirements. See the class descriptions below.

Degree Programmes

BA with Honours in Philosophy

Students wishing to specialize in philosophy should take an honours degree, the normal preparation for graduate study in philosophy. An honours degree will include an honours qualifying essay and the equivalent of at least ten full-year classes in philosophy, including: (a) at least two half-year classes (or the equivalent) in "Logic;" (b) at least two half-year classes (or the equivalent) in "History of Philosophy;" (c) at least six half-year classes (or the equivalent) at the 3000-level or above; (d) at least two half-year classes (or the equivalent) at the 4000-level. At least nine of the classes in Philosophy must be beyond the 1000-level. Students should contact the department for instructions regarding the honours qualifying essay.

BA with Advanced Major in Philosophy

In their final fifteen classes, students must include at least six full-year classes in philosophy beyond the 1000-level (two half-year classes may be substituted for a full-year class) including: (a) at least one "Logic" class (half or full-year), unless this requirement has been met in the first year; (b) at least one full-year "History of Philosophy" class (or two half-year classes); (c) at least three full-year classes (or equivalent in half-year classes) at the 3000-level or above.

BA with Major in Philosophy

In their second and third years, students must take at least four full-year classes in philosophy beyond the 1000-level (two half-year classes may be substituted for a

full-year class) including: (a) at least one "Logic" class (half or full-year), unless this requirement has been met in the first year; (b) at least one "History of Philosophy" class (half or full-year); (c) at least two full-year classes or four half-year classes at the 3000-level or above.

All students planning to take a degree in philosophy should first talk to an undergraduate advisor in the department.

Note: Two half-year classes at a certain level or in a certain area are considered the equivalent of one full-year class at that level or in that area. In the class descriptions to follow, "one class" unqualified will mean "one full-year class or two half-year classes." Also note that only classes whose titles begin with "Logic" or "History of Philosophy" may be used to satisfy the logic and history of philosophy requirements for a BA with major or honours in philosophy.

Classes Offered

Note: Many classes are listed as being exclusionary to one another. This means that students may not take both classes so designated. The class numbers designate classes which, prior to 1984-85, were numbered without the last digit (zero), e.g., the present class PHIL 2130R was previously called Philosophy 213. The prerequisites and exclusionary designations below should be interpreted accordingly. Detailed descriptions are available from the department on request.

Note: Classes marked * may not be offered every year. Please consult the current timetable on registration to determine if these classes are offered.

1000-Level

PHIL 1000R Introduction to Philosophy: An introduction to a variety of philosophical problems, such as the relation of mind to body, freedom of the will, the foundation of morality, the existence of God, the nature of personal identity, and the possibility of knowledge based on reason and experience. Sections differ somewhat in approach and requirements. Consult the department to find out which ones especially suit you. This class does not satisfy the Faculty Writing Requirement.

Instructor: Staff
Format: Lecture/discussion 2 hours
Prerequisite: None
Enrolment: 100
Exclusion: PHIL 1010R, PHIL 1020R, PHIL 2000R, PHIL 2040A and PHIL 2050B

PHIL 1010R Introduction to Philosophy: See description for PHIL 1000R. This class does satisfy the Faculty Writing Requirement.

Instructor: Staff
Format: Lecture/discussion 2-3 hours
Prerequisite: None
Enrolment: 50
Exclusion: PHIL 1000R, PHIL 1020R, PHIL 2000R, PHIL 2040A and PHIL 2050B

***PHIL 1080A or B Reasoning Skills:** Thinking clearly and effectively is something that people can learn to do. Understanding some basic concepts as well as mastering certain practical techniques can help in this. In this class you will learn about classifying concepts and how to define them; about the nature of arguments and the way to bring their structure to the surface by diagramming techniques; about some of the classic fallacies people commit in their reasoning; about some of the basic concepts and procedures of Logic. This class does not satisfy the logic requirement for the major or honours in Philosophy.

Instructor: T. Vinci
Format: Lecture/discussion 2 hours
Prerequisite: None
Enrolment: 100
Exclusion: PHIL 1090A or B, and PHIL 2150A or B

***PHIL 1090A or B How to Win an Argument:** This class is devoted to developing the practical skills involved in evaluating reasoning and producing convincing arguments. Note this class does not count toward satisfying the logic requirement for the major or honours programme.

Instructor: T. Tomkow
Format: Lecture/discussion 2 hours
Prerequisite: None. For first year students only.
Enrolment: 100
Exclusion: PHIL 1080A or B, and PHIL 2150A or B

PHIL 1100A or B Legal Thinking: Examination of controversial legal cases leading to increased understanding of the nature of law and the techniques of practical moral reasoning.

Instructor: N. Brett
Format: Lecture/discussion 2 hours
Prerequisite: None
Enrolment: 100
Exclusion: None

***PHIL 1111R Logic: Elementary Symbolic Logic:** An introduction to an artificial language constructed so as to make the operations of reasoning more precise. Meets logic requirement for majors only if taken in first year.

Instructors: F. Schotch, R. Martin
Format: Lecture/discussion 2-3 hours

Prerequisite: None
Enrolment: 100
Exclusion: PHIL 1112A or B, PHIL 2110R and PHIL 2130A or B

***PHIL 1112A or B Logic: Elementary Symbolic Logic:** An abbreviated version of PHIL 1111R. Meets logic requirement for majors only if taken in first year.

Instructors: P. Schotch, R. Martin
Format: Lecture/discussion 2 hours
Prerequisite: None
Enrolment: 100
Exclusion: PHIL 1111R, PHIL 2110R and PHIL 2130A or B

2000-Level

***PHIL 2040A/PHIL 2050B Introduction to Philosophy I and II:** See description for PHIL 1000R above. A student may take either or both half-year classes. Neither class satisfies the Faculty Writing Requirement.

Instructor: Staff
Format: Lecture/discussion 2 hours
Prerequisite: None
Enrolment: 100
Exclusion: PHIL 1000R, PHIL 1010R, PHIL 1020R and PHIL 2000R

PHIL 2070R Ethics and Politics: This class, formerly known as *Justice, Law and Morality (Concepts Version)*, is complementary to PHIL 2270R (*Politics and Ethics*). Hobbes is the only author treated in both classes. The class may be taken for credit before, after, or concurrently with the other class. Either class satisfies the minimum requirement in political philosophy for an Honours degree in Political Science. An overview of early modern and modern political thought, this class examines the bases of political obligation and the political requirements of justice. While the class surveys the works of political theorists from Hobbes to Habermas the emphasis is upon the normative issues underlying much of today's political debate.

Instructor: K. Fierbeck
Format: Discussion 2-3 hours
Prerequisite: None. One year of university work in Arts and Social Sciences is recommended as preparation, though first-year students can succeed.

Enrolment: 80
Exclusion: PHIL 2070R under its old title, *Justice, Law & Morality: Concepts Version*

Cross-listing: POL 2401R

***PHIL 2080R Ethics in the World of Business:** Business practices are sometimes in accord with moral principles, sometimes at odds with them. Where in business is it easiest to be scrupulous? Where is it hardest? Could things be changed for the better, and, if so, what would be involved?

Instructor: Staff
Format: Lecture/discussion 2-3 hours
Prerequisite: None
Enrolment: 70
Exclusion: None

***PHIL 2081A, B, or C Ethics in the World of Business:** See description for 2080R.

Instructor: Staff
Format: Lecture/discussion 2-3 hours
Prerequisite: None
Enrolment: 70
Exclusion: None

***PHIL 2100A or B Logic: Logic and Knowledge:** An introduction to logic, theory of knowledge, and some basic concepts used in contemporary philosophy, through the use of the notion of "possible worlds".

Instructor: R.M. Martin
Format: Lecture
Prerequisite: None
Enrolment: 140
Exclusion: None

PHIL 2130A or B Logic: Deduction: A systematic introduction to the operations of formal deductive logic. The same topics are covered as in PHIL 1111R, but at a quicker pace, with considerable attention devoted to the relation between artificial and natural language and to the philosophical problems that arise from the study of reasoning. No previous study of logic is presupposed.

Instructor: P.K. Schotch, R. Campbell
Format: Lecture/discussion 2 hours
Prerequisite: None
Enrolment: 50
Exclusion: PHIL 1111R, PHIL 1112A or B and PHIL 2110R

PHIL 2140A or B Logic: Logical Theory I: An introduction to metalogic, with special attention to the soundness and completeness of formal systems, and to the philosophical evaluation of non-classical logics.

Instructor: P. Schotch
Format: Lecture/discussion 2 hours
Prerequisite: PHIL 1111R, PHIL 1112A or B or PHIL 2130A or B
Enrolment: 50
Exclusion: None

PHIL 2160A or B Philosophical Issues of Feminism: An exploration and examination of some of the concepts, issues, and arguments underlying feminist claims and perspectives. Such topics as pornography, rape, mothering, the nature of gender, and feminism's responses to racism will be considered.

Instructor: S. Sherwin, S. Campbell
Format: Lecture/discussion 3 hours
Prerequisite: None
Enrolment: 70
Exclusion: None
Cross-listing: Women's Studies 2500A or B

PHIL 2175A or B Introduction to Philosophy of Education: A lecture/discussion class dealing with a broad range of philosophical questions about education including the use of slogans, multiculturalism, teacher education, and the role of the teacher. Students may also take PHIL 2180B.
Instructor: W. Hare
Format: Lecture/discussion 2 hours
Enrolment: 12
Exclusion: Not open to first year students
Cross-listing: EDUC 4221A

PHIL 2180A or B Issues in Philosophy of Education: An introductory level, lecture/discussion class dealing with some fundamental issues in philosophy of education, including indoctrination, open-mindedness and bias-free teaching. Open to students who have taken PHIL 2175A or EDUC 4221A.
Instructor: W. Hare
Format: Lecture/discussion 2 hours
Exclusion: Not open to first-year students
Enrolment: 12
Cross-listing: EDUC 4222A or B

***PHIL 2200R Philosophy of Religion:** An introduction to the philosophy of religion, examining such questions as: Why is religion so difficult to define? Is it rational to believe in a divine being? Can religious experiences be validated?
Instructor: Staff
Format: Lecture/discussion 2 hours
Prerequisite: None
Enrolment: 70
Exclusion: PHIL 2205A or B

***PHIL 2205A or B Philosophy of Religion:** See description for PHIL 2200R.
Instructor: Staff
Format: Lecture/discussion 2 hours
Prerequisite: None
Enrolment: 40
Exclusion: PHIL 2200R

***PHIL 2260A or B Philosophy of Art:** Examines questions such as: What is art? Can judgements of artistic value be rational and objective? Can fear of fictional objects be real fear? Can music be a language?
Instructor: S.A.M. Burne
Format: Lecture/discussion 2 hours
Prerequisite: None
Enrolment: 70
Exclusion: None

PHIL 2270R Politics and Ethics: This class, formerly known as *Justice, Law and Morality (Regimes Version)*, is complementary to PHIL 2070R (*Ethics and Politics*). Hobbes is the only author treated in both classes. The class may be taken for credit before, after, or concurrently with the other class. Either class

satisfies the minimum requirement in political philosophy for an Honours degree in Political Science.

Why, and under what conditions, ought human beings to accept a state with coercive powers expressed in laws and otherwise? What are the proper ends of political association, and how can these be morally justified? What is a just regime? What is the best (or at least the least bad) regime? These are perennial questions addressed by the great political thinkers, and it is to answers put forward by Plato, Aristotle, Machiavelli, Hobbes, Rousseau, Burke, Tocqueville and others that we turn in this class.

Instructor: B.L. Crowley
Format: Lecture 2 hours
Prerequisite: None. One year of university work in Arts and Social Sciences is recommended as preparation, though first-year students can succeed.
Enrolment: limited to 60
Exclusion: PHIL 2270R under its old title, Justice, Law, & Morality: Regimes Version

Cross-listing: POL 2400R

PHIL 2360A or B and *PHIL 2370A or B History of Philosophy: Ancient Philosophy I and II: The beginnings of Western philosophy are studied in the writings of pre-Socratics, Plato, Aristotle, and their successors.

Instructors: T. Vinol, S.A.M. Burne
Format: Lecture/discussion 3 hours
Prerequisite: One previous class in philosophy
Enrolment: 25
Exclusion: None

***PHIL 2361A or B and *PHIL 2362A or B Classical and Early Christian Philosophy:** Special attention is given to Plato and Aristotle, and to the Greek philosophy of the first centuries A.D., and its influence on developing Christian thought.

Instructors: W.J. Hankey, J.P. Atherton
Format: Lecture/discussion 2 hours
Prerequisite: Permission of the instructor
Enrolment: 50
Exclusion: None
Cross-listing: CLAS 2361A, CLAS 2362A or B

***PHIL 2360R Medieval Philosophy:** Anselm, Aquinas, Ockham, some XIII Century Augustinians and Averroists and late Medieval mystics are studied most closely; attention is given to related political, literary, and theological concerns.

Instructor: R. Crouse
Format: Lecture/discussion 2 hours
Prerequisite: Permission of the instructor
Enrolment: 50
Exclusion: None
Cross-listing: CLAS 3380R

***PHIL 2410A or B Philosophy of Psychology:** An examination of philosophical issues arising from the scientific study of the mind.

Instructor: T. Tomkow
 Format: Lecture/discussion 2 hours
 Prerequisite: One previous class in philosophy or psychology

Enrolment: 70
 Exclusion: None

***PHIL 2480A or B Environmental Ethics:** This class will examine the relationship of humankind to nature and contemporary environmental problems from a philosophical perspective. Areas looked at will include pollution, energy, rare species, and environmental law, with a special emphasis on ethical issues in agriculture. An overall question of the class will be whether or not we need reform or radical change in our relationship to nature.

Instructor: M. Campbell
 Format: lecture and discussion
 Prerequisite: None
 Enrolment: 35
 Exclusion: None

***PHIL 2550A or B Marxist Theory and Its Upshot in the Modern World:** Marxist theory combines themes of Hegelian philosophy with the economics of the British classical school. The class will consider how the mature works of Marx and Engels express this combination. It will then trace the fate of the combination in diverse attempts to fit it to circumstances, in Western Europe and in Russia, that Marx did not foresee. Finally it will ask how far any of these versions of Marxism is relevant to the current epoch.

Instructor: Staff
 Format: Lecture/discussion 2 hours
 Prerequisite: None
 Enrolment: 70
 Exclusion: None
 Cross-listing: POL 2455A or B

PHIL 2610A or B History of Philosophy: The Rationalists: The philosophy of Descartes, Spinoza, and Leibniz.

Instructors: S. Campbell, S.A.M. Burns
 Format: Lecture/discussion 3 hours
 Prerequisite: One previous class in philosophy

Enrolment: 40
 Exclusion: None

PHIL 2620A or B History of Philosophy: The Empiricists: The philosophy of Locke, Berkeley, and Hume, with an Introduction to Kant.

Instructors: S.A.M. Burns, T. Vinol, D. MacIntosh
 Format: Lecture/discussion 3 hours
 Prerequisite: One previous class in philosophy

Enrolment: 40
 Exclusion: None

***PHIL 2660A or B Logic: Understanding Scientific Reasoning:** An introduction to the principles of scientific prediction and rational choice. The class examines the workings of chance, or probability, and the theory of games.

Instructor: Staff
 Format: Lecture/discussion 2 hours
 Prerequisite: None
 Enrolment: 70
 Exclusion: None

***PHIL 2700R Philosophy in Literature:** A study of some philosophical themes in modern literature. All readings will be literary works.

Instructor: R.M. Martin
 Format: Lecture/discussion 2 hours
 Prerequisite: None
 Enrolment: 70
 Exclusion: PHIL 2705A or B

***PHIL 2705A or B Philosophy in Literature:** See description for PHIL 2700R.

Instructor: R.M. Martin
 Format: Lecture/discussion 2 hours
 Prerequisite: None
 Enrolment: 70
 Exclusion: PHIL 2700R

PHIL 2710A or B Existentialism: A general introduction to existentialist themes and authors including Kierkegaard, Nietzsche, Sartre, and Camus.

Instructor: N. Brett
 Format: Lecture/discussion 2 hours
 Prerequisite: None
 Enrolment: 50
 Exclusion: PHIL 2170R

PHIL 2800R Ethics and Health Care: (formerly Ethics & Medicine): Modern health care generates moral problems which cannot be settled on the basis of medical knowledge alone but need to be considered in the light of moral philosophy. Among the problems to be considered in this class are: euthanasia, informed consent, confidentiality, paternalism, coercion, abortion, and the allocation of scarce resources.

Instructor: S. Sherwin
 Format: Lecture/discussion 2 hours
 Prerequisite: None
 Enrolment: 80
 Exclusion: None

3000-Level

PHIL 3051A or B Theory of Knowledge: A study of fundamental issues in the theory of knowledge. The class examines Skepticism, Rationalism, and Empiricism, and investigates the nature of knowledge, belief, meaning, evidence, and truth. Questions are raised about perception and memory and their relation to knowledge as well as questions

about our knowledge of ourselves and other people. Attention is given to ancient and modern authors.

Instructors: T. Vinci, D. MacIntosh
Format: Lecture/discussion 3 hours
Prerequisite: PHIL 2810A or B, PHIL 2820A or B or permission of the instructor
Enrolment: 25
Exclusion: PHIL 3050R

***PHIL 3060A or B Logic: Logical Theory II:**

Devoted primarily to the study of formal semantics and its relation to symbolic language.

Instructor: P. Schotch
Format: Lecture/discussion 2 hours
Prerequisite: PHIL 2130, PHIL 2140 or permission of the instructor
Enrolment: 25
Exclusion: None

PHIL 3100R Ethics: A systematic study of the foundation of morality, including readings from Kant, Foundation of the Metaphysics of Morals; Hume, A Treatise of Human Nature; and Rawls, A Theory of Justice.

Instructor: R. Campbell, K. Vihvelin
Format: Lecture/discussion 3 hours
Prerequisite: 2 previous classes in philosophy, preferably classes in history of philosophy and logic
Enrolment: 25
Exclusion: PHIL 3105A or B

***PHIL 3105A or B/C Ethics: An abbreviated version of PHIL 3100R.**

Instructor: N. Brett, K. Vihvelin
Format: Lecture/discussion 2-3 hours
Prerequisite: 2 previous classes in philosophy, preferably classes in history of philosophy and logic
Enrolment: 25
Exclusion: PHIL 3100R

PHIL 3170A or B Theories of Feminism: A study of the theoretic underpinning of the major feminist theories in critical comparison, concentrating on the ideological disputes and the implications for traditional approaches to social and political thought.

Instructor: S. Sherwin
Format: Seminar 2 hours
Prerequisite: 2 previous classes in Philosophy or Women's Studies
Enrolment: 25
Exclusion: None
Cross-listing: Women's Studies 3500A or B

***PHIL 3211A or B Philosophy of Law: Is coercion central to the concept of law? How are law and morality related? These and other issues relating to the analysis and evaluation of law will be dealt with in a way**

that utilizes specific statutes and cases, e.g. the Narcotics Control Act and the Morgentaler Case.

Instructor: N. Brett.
Format: Lecture/discussion 2 hours
Prerequisite: One previous class in philosophy
Enrolment: 25
Exclusion: None

***PHIL 3285A or B Aesthetics: This class examines major texts in philosophical aesthetics. We begin with relevant parts of Kant's *Critique of Judgement* and conclude with a consideration of Wittgenstein's contribution, especially in *Lectures and Conversations*, and *Culture and Value*.**

Instructor: S.A.M. Burns
Format: lecture
Prerequisite: PHIL 2280A or B or instructor's consent
Enrolment: 30

PHIL 3300A or B Philosophy of Language: What does it mean to say that the elements of language have meaning?

Instructors: R. Martin, D. MacIntosh
Format: Lecture/discussion 2 hours
Prerequisite: Two previous classes in philosophy including one logic class, half- or full-year
Enrolment: 30
Exclusion: None

***PHIL 3420A or B Philosophy of Biology:**

The class begins with a general introduction to the philosophy of science, focusing on the often conflicting criteria for evaluating scientific theories. The relative importance of successful novel predictions, consistency, simplicity, scope, and fruitfulness are assessed in relation to the current status of Darwinian evolutionary theory. In considering the competing views of Popper, Hempel, Kuhn, Lakatos, and Giere, emphasis will be placed on the logic of scientific reasoning and the question whether there can be objectivity and progress in science. The class then turns to issues surrounding the role of teleology in current biological thought: the interpretation and significance of biological functions, the debate about whether genes are the fundamental units of natural selection, and the alleged reduction of modern genetics to physics and chemistry. Finally, the class considers the implications of human sociobiology for matters of traditional philosophical concern: the possibility of biological determinism, the origins of morality, and the reliability of cognitive functions.

Instructor: R. Campbell
Format: Lecture/discussion 2 hours
Prerequisite: One previous class in philosophy or biology
Enrolment: 70

Exclusion: PHIL 2420A or B
Cross-listing: BIOL 3580A or B

***PHIL 3440A or B Philosophy of Mind:** A systematic study of the mind-body problem and/or theories of personal identity.

Instructor: T. Tomkow
Format: Lecture/discussion 2 hours
Prerequisites: Two previous classes in philosophy

Enrolment: 30
Exclusion: PHIL 4480A or B

***PHIL 3460A or B Mind and Brain:** An interdisciplinary approach, combining philosophical analysis and neuroscientific data to study current controversies about the relation between brain function and conscious experience, such as why consciousness evolved and how it is organized in the normal human brain, and whether the mental can be construed as itself physical.

Instructor: T. Tomkow
Format: Lecture/discussion 2 hours
Prerequisites: Two previous classes in philosophy

Enrolment: 30
Exclusion: None

***PHIL 3520A or B Philosophy of Social Science:** An examination of philosophical questions about the presupposition, aims, and methods of the social sciences, for example, whether the quantitative methods of the natural sciences are appropriate in the social sciences.

Instructor: Staff
Format: Lecture/discussion 2 hours
Prerequisites: One previous class in philosophy, political science, economics, or sociology and social anthropology

Enrolment: 15
Exclusion: PHIL 351A or B and PHIL 2510A or B

Cross-listing: POL 3498A or B

***PHIL 3530A or B Freedom, Action, and Responsibility:** An investigation of the nature of action, seeking criteria for individuating, describing, and explaining actions. Topics may include the roles of volitions, intentions, motives, and reasons in actions; responsibility for actions and the concept of free actions.

Instructors: P. Schotch, D. MacIntosh
Format: Lecture/discussion 2 hours
Prerequisites: Two previous classes in philosophy

Enrolment: 30
Exclusion: PHIL 4450R, PHIL 4530A or B

***PHIL 3630A or B History of Philosophy:** Kant: Special attention will be paid to Kant's metaphysics.

Instructor: T. Vinci

Format: Lecture/discussion 2 hours
Prerequisite: PHIL 2610A or B or PHIL 2620A or B or permission of the instructor

Enrolment: 30
Exclusion: None

***PHIL 3640A or B History of Philosophy: Twentieth-Century Philosophy:** The Twentieth Century has been a period of revolutionary change in Anglophone philosophy. This class surveys the most influential figures, including Frege, Russell, Wittgenstein, and Quine.

Instructor: D. MacIntosh
Format: Lecture/discussion 2 hours
Prerequisite: One previous class in the history of philosophy or permission of the instructor

Enrolment: 25
Exclusion: None

***PHIL 3670A or B Philosophy of Science:** Induction, probability, and explanation are studied with special attention to the nature of scientific theories. No scientific background is presupposed.

Instructor: D. MacIntosh
Format: Lecture/discussion
Prerequisite: At least two previous classes in philosophy, including one half- or full-year logic class such as PHIL 2660A or B

Enrolment: 30
Exclusion: None

***PHIL 3720R Phenomenology of Literature:** The class will examine how philosophical and literary works function in terms of their uses of language, presentation of ideas, and articulation of experience. What is the difference between literature and philosophy? How can literature increase one's understanding of the real world? Readings will include both literature and philosophy.

Instructor: Staff
Format: Lecture/discussion
Prerequisite: A class in history of philosophy or permission of instructor. Previous study of literature is desirable

Enrolment: 12
Exclusion: None

***PHIL 3851A or B Metaphysics:** A study of topics such as the nature of substance and change, body and mind, cause and effect, and the concept of existence.

Instructor: T. Tomkow
Format: Lecture/discussion
Prerequisite: Two previous philosophy classes including at least one half- or full-year logic class

Enrolment: 25
Exclusion: PHIL 3850R

***PHIL 3900A or B Logic: Logic and Philosophical Analysis:** This class will examine the application of logical theory to philosophical problems and issues in the philosophy of logic. Topics in this area include: reference and definite descriptions, problems of intensionality, relativized identity and sortals, bivalence and the sorites paradoxes, logicism and set theoretic paradoxes, trans-world identity, paradoxes of confirmation, counterfactuals, multivalued logic, quantum logic, Arrow's theorem, analyticity and the a priori, negative existentials.

Instructor: Staff
Format: Lecture/discussion
Prerequisites: Two previous philosophy classes including one half- or full-year class in modern symbolic logic

Enrolment: 30
Exclusion: None

4000-Level

Note: Classes at this level are intended for advanced undergraduates with a strong background in philosophy. No specific prerequisites are listed, but it is assumed that normally a student will have already taken relevant classes at the 3000-level. Classes with titles beginning "Topics in . . ." have no description, since the selection of topics and instructor is determined after the time of calendar preparation. The format for these classes is seminar, 2 hours, and enrolment is limited to 15. Interested students should consult the department for up-to-date information.

***PHIL 4055A or B Topics in Epistemology**

***PHIL 4070A or B Topics in Philosophical Psychology**

***PHIL 4080A or B Topics in Logical Theory**

***PHIL 4115A or B Topics in Ethics I**

***PHIL 4120A or B Theory of Rational Decision:** A study of foundational problems in contemporary theory of rational decision, drawing on work by philosophers, psychologists, economists and mathematicians.

Instructor: R. Campbell

***PHIL 4125 A or B Topics in Ethics II:**

Instructor: K. Vilhvalin

***PHIL 4180A or B Topics in the History of Philosophy I**

***PHIL 4191A or B Topics in the History of Philosophy II**

***PHIL 4192A or B Topics in the History of Philosophy III**

***PHIL 4200A or B Topics in Normative Theory**

***PHIL 4215A or B Topics in the Philosophy of Law**

***PHIL 4220A or B Contemporary Philosophical Issues:** Intensive study of a few topics which are currently being debated and may fall outside of or cut across standard classification of areas of interest. Examples are: artificial intelligence, probability, sociobiology, causal theories, reduction.
Instructor: Staff

***PHIL 4430A or B Game Theory as a Foundation for Ethics and Politics:** The most innovative recent work in ethical theory has applied the theory of games to the perennial problem of the social contract. To what extent can any organized society to which people freely adhere be represented as constituted by rules arrived at by rational agents trying each to arrive at the best bargain about rules with the other agents present? These rules can be regarded simultaneously as the foundation of political organization and as elementary rules of ethics, and a study of this topic forms the base of the class.

Instructor: Staff
Format: Seminar
Prerequisite: Permission of the instructor
Exclusion: None
Cross-listing: POL 4485A or B and ECON 4447A or B

***PHIL 4470A or B Utilitarianism, Classical Liberalism, and Democracy:** The study of two beliefs characteristic of classical liberalism: that good government is strictly limited government, and that there is no standard for social policy beyond the combination of personal preferences.

Instructor: Staff
Format: Seminar
Prerequisite: Permission of the instructor
Exclusion: None
Cross-listing: POL 4479A or B and ECON 4448A or B

***PHIL 4480A or B Social Choice Theory:** Arrow's theorem brings together the theory of voting and welfare economics, seemingly leading both (and the theory of democracy as well) to ruin. This class will consider how to cope with the problem. Cross-listed in Economics and Political Science.

Instructor: Staff
Format: Seminar
Prerequisite: Permission of the instructor
Exclusion: None
Cross-listing: POL 4480A or B and ECON 4448A or B

***PHIL 4500 A or B Topics in Feminist Philosophy:** In this class we shall explore some of the current research in a focused area of feminist philosophy, such as feminist

ethics, feminist epistemology, feminist philosophy of science, or postmodern feminism.

Instructor: S. Sherwin
Format: seminar, 2 hrs
Prerequisite: strong background in philosophy or feminist theory (normally including at least one previous class in feminist philosophy or instructor's consent)

Enrollment: 25
Cross-listing: WOST 4500A or B

*PHIL 4510A or B Topics in the Philosophy of Language

*PHIL 4600A or B Philosophy of Religion

*PHIL 4680A or B Topics in the Philosophy of Science

*PHIL 4855A or B Topics in Metaphysics

PHIL 4940A or B, 4960A or B, 4980A or B & 4960R, 4970R, 4990R Directed Reading: Consult department for details. In special cases, classes to suit individual interests can be developed jointly by a student and an instructor.

Instructor: Staff
Prerequisite: Permission of instructor

Changes and Additions

As the Calendar goes to press before plans for the next academic year are completed, there may be significant changes in the classes listed above. In particular, not all classes are offered in each academic year. Students should consult the Department for names of instructors and revisions.

Physics

Location: Sir James Dunn Science Building
Telephone: (902) 494-2337
Fax: (902) 494-5191

Chair of Department
 A.M. Simpson

Undergraduate Advisor
 D.F. Goble (494-3582)

Graduate Advisor
 R.A. Dunlap (494-2394)

Coordinator, Diploma in Meteorology
 P. Chyliak (494-1456)

Coordinator, Co-op Programme
 R.H. Marsh (494-2312)

Professor Emeritus
 W.J. Aohlbald, MA (Dal), PhD (Virg), DSo (UNB), DSo (Dal), FRSC

Professors
 D.D. Betts, BSo, MSc (Dal), PhD (McG), FRSC
 B.L. Blackford, BSo (Acadia), MSo (MIT), PhD (Dal)
 M.G. Caldn, BSo, MSc (Dal), PhD (UBC)
 P. Chyliak, Physics Diploma (Charles U., Czech.), PhD (Calif-Riverside), FOSA - cross appointment with Oceanography
 R.A. Dunlap, BS (Worcester), AM (Dart), PhD (Clark)
 D.J. W. Geldart, BSo (Acadia), PhD (McM), FRSC - A.C. Fales Professor of Theoretical Physics

M.H. Jericho, BSo, MSc (Dal), PhD (Cantab) - George Munro Professor of Physics
 D.B. I. Kiang, BSo. (MtA), MSo, PhD (McM)
 H.J. Kreuzer, MSc, DSo (Bonn)
 G.F.O. Langetroth, BSo (Alta), MSc (Dal), PhD (London)
 R.H. Marsh, BSo, MSc (Dal), DPhil (Oxon)
 B.E. Paton, BSo, MSc (Waterloo), PhD (McG)
 R. Ravindra, BSc, MTech (IIT, Kharagpur), MA (Dal), MSc, PhD (Tor) - major appointment with Comparative Religion
 P.H. Reynolds, BSo (Tor), PhD (UBC) - cross appointment with Earth Sciences
 A.M. Simpson, BA (Cantab), MSo, PhD (Dal)
 G. Stroink, BSo, MSc (Delft), PhD (McG), PEng - minor appointment with Physiology and Biophysics
 M.A. White, BSc (Western), PhD (McM) - major appointment with Chemistry

Associate Professors
 J.G. Cordes, BSo, MSo (Dal), PhD (Cantab)
 D.F. Goble, BSo, MSc (Alta), PhD (Tor)

D.A. Tindall, BA, PhD (Cantab)
 C.G. White, BSo, MSo (Dal)

Assistant Professors
 W.T. Hyde, BSc (Tor), MSo (Waterloo), PhD (Tor) - cross appointment with Oceanography
 D. Labrie, BSo (Montreal), MSc, PhD (McM)

Senior Instructors
 F.M. Fyfe, MSo (Dal)
 W. Zukauekas, BSo (Dal)

Research Associates
 A.K. Das, DPhil (Oxon)
 V. Gelfandbein, PhD (Tech. Inst., Israel)
 I. Golub, PhD (Ben Gurion, Israel)
 P. Mulhern, PhD (UBC)
 S.H. Payne, PhD (Canterbury, NZ)
 R.L. Wang, PhD (Dal)
 Z. Wang, PhD (Man)

Postdoctoral Fellows
 A.S. Ferguson, PhD (Case Western Reserve)
 N. Kalyaniwalla, PhD (Rensselaer)
 S. Masui, PhD (Tor)
 G. Videen, PhD (Arizona)
 Z. Yang, PhD (Oslo)
 X. Zhang, PhD (Nagoyo Inst of Tech)

Adjunct Professor
 A.D. J. O'Neill, PhD (Sask), Atmospheric Environment Services

MacGregor Teaching Fellows
 S. Dobbie
 S. Giese
 D. Mercer
 W. Xu
 M. Yewondwoosen

Introduction

Physics is the study of the fundamental properties of energy and matter, and of the space in which they are found. It seeks to describe and explain the great diversity of nature with the fewest and simplest hypotheses, and to show the underlying similarities of seemingly diverse phenomena. It requires imagination disciplined by logic, and its success is judged by whether or not nature confirms its predictions when tested by experiment. An understanding of physics must be built on a good foundation. The various programmes are arranged to do this in an orderly, efficient way.

First Year Classes

There are six first year classes. Physics 1200 and 1450 are general interest classes for BA students and are not acceptable as prerequisites for further classes in physics. Physics 1000, 1100, 1300 and 1500A/1500B all give a general Introduction

to physics, but each has its own particular approach and selection of topics.

Physics 1000 is a survey class offering a wide range of topics in both classical and modern physics. It is primarily intended for students in arts and science, has regular tutorials, no labs, does not use calculus, and is not normally accepted as a prerequisite for advanced physics classes.

Physics 1100 is primarily for students intending to make a study of a physical science or engineering; it has regular labs, occasional tutorials, uses calculus, and is the accepted prerequisite for advanced physics classes. Background in physics equivalent to Nova Scotia Grade XII is strongly recommended.

Physics 1300 is an introductory class which is oriented towards the health sciences and is primarily intended for students in biology, pre-medicine, pre-dentistry and allied health sciences. The class incorporates labs and tutorials, and is accepted as a prerequisite for advanced physics classes when Mathematics 1000A and 1010B are taken concurrently.

Physics 1500A/1550B is intended for students considering an honours programme in a physical science. It has regular labs and tutorials, uses calculus, and is an accepted prerequisite for advanced physics classes. High standing in high school physics and mathematics is required.

Degree Programmes

BSc with Honours in Physics

All students who intend to take a BSc with Honours in Physics are encouraged to discuss their programme with staff members of the department, and to consult with the Chairperson or Undergraduate Advisor of the department at the beginning of the second year. The following classes will normally be taken.

Year 1: Chemistry 1010R or equivalent; Mathematics 1000A and 1010B, or 1500R; Physics 1100R or 1500A/1550B; an elective, and a writing requirement class.

Year 2: Physics 2000A, 2005A, 2010B, 2015B; two Mathematics classes; elective.

Year 3: Physics 3000A, 3010B, 3080B, 3140A, 3200A, 3210B; Mathematics 3110A, 3120B; elective.

Year 4: Four physics classes at the 4000 level, including 4000A or B, 4100A or B, 4180A, 4151A, 4152B, 4230A or B, and an elective. A comprehensive examination is also required.

Students with special interests must select electives carefully. The following suggestions may serve as a guide.

Applied Physics Option: Physics 3250A, 3340A, 3440B, 3810B, 4220A, 4800C.

Theoretical Physics Option: Physics 4170B, 4180A or B, 4480A, 4650A/4660B, 4800C; Mathematics classes such as complex variables, modelling, or advanced differential equations.

B.Sc. with Honours in Physics (Applied Physics Stream)

Students with an interest in the applications of physics to technology and industry are encouraged to consider the Co-operative Education Programme in Physics. See the description below of the Co-op Programme. Note that the mixture of academic and work terms extends the total degree time by one year.

Year 1: Physics 1100R or 1500A/1550B; Chemistry 1010R or equivalent; Mathematics 1000A and 1010B, or 1500R; Computer Science 1400A and 1410B; elective

Year 2: Physics 2000A, 2005A; Math 2001A or 2480A, and 2080A; Elective - A term; From January 1st - Work term I; Summer: (Option for) Computing Science elective, and elective.

Year 3: From September 1st - Work Term II; Physics 2010B, 2015B; Math 2002B or 2490B, and 2040B; Elective - B term; Summer: Work term III.

Year 4: Physics 3000A or 3340A, 3010B, 3140A, 3200A, 3210B, 3250A, 3440B, 3810B; Math 3110A, 3120B; Summer: Work term IV.

Year 5: Physics 4000A, 4151A, 4180A, 4100B, 4230B, 4180B, 4800C; Technical electives: one and a half.

The technical elective classes may be selected from TUNS or Dalhousie classes in Materials Science, Computing Science, Physical Chemistry, Medical Engineering, Oceanography, Meteorology, etc., in consultation with the programme coordinator.

Combined Honours

Students interested in both physics and another science may wish to take a BSc with Honours in Physics and the other subject combined. Students contemplating such a programme should, in any case, consult the departments before the beginning of their second year of study.

Combined Honours in Physics and Computer Science

Students who are interested in a core programme in physics with a substantial component of computing science may wish to take a combined honours programme in the two subjects. An approved selection of classes which meets this objective is as follows:

Year 1: Physics 1100R or 1500A/1550B; Computing Science 1400A, 1410B; Mathematics 1000A/1010B or 1500R; Chemistry 1010R; Elective (language and humanities group, which also satisfies the writing requirement).

Year 2: Physics 2000A, 2005A, 2010B, 2015B; Computing Science 2450B, 2610A; Mathematics 2000R, 2030A, 2040B.

Year 3: Physics 3000A, 3010B, 3090B, 3140A, 3200A, 3210B; Computing Science 2350A, 2700B; Mathematics 3110A, 3120B.

Year 4: Physics 4100B, 4151A, 4152B, and one of 4000A, 4160A or 4220A; Computing Science 3040A, 3170B, 3250A, 3700B; Elective (social sciences group).

Co-operative Education Programme in Physics

The Co-operative Programme provides physics students with an integrated pattern of academic study and supervised work terms in industry, government laboratories and institutes, etc. The programme enables students to obtain a better appreciation of the practical problems they will face in their physics careers upon leaving the university. The work term experience gives students an opportunity to orient themselves at an early stage towards the practical application of their newly acquired knowledge, and adds to their motivation for academic study.

Eligibility

Students entering their second year of an honours programme in physics or combined honours programme at Dalhousie are eligible for admission.

The Work Study Programme

The Programme consists of 8 academic terms and 4 supervised work terms. The academic programme and required classes are the same as for the BSc degree with Honours in Physics. In addition, in year 2, Co-op students are required to participate in the non-credit co-op orientation programme.

Further Information

For further information contact the Programme Co-ordinator, Co-operative Education Programme in Physics, Department

of Physics, Dalhousie University, Halifax, N.S. B3H 3J5.

Advanced Major (20-credits)

The department is able to offer a major in the 20-credit programme. For further information refer to specific regulations for the 20-credit programmes on page 101.

Bachelor's Degree/Major in Physics (15-credits)

Students intending to major in physics should include Physics 1100R and Mathematics 1000A and 1010B or 1500R in their first-year programme. (Physics 1000R is not normally included in a "Major".) Physics 2450R, 3402A, 4020B may not be included in a "Major" to satisfy regulation 11.1(b)(d). (These classes may, however, be taken as additional electives with a "Major"). At least two 3000-level classes must be included, but in any one year, no student in a degree programme may take only Physics 3000A/3010B and Physics 3340A.

BSc Major in Physics

(Example only, other possibilities exist):

Year 1: Physics 1100R, (Math 1000A & 1010B), science, arts, elective.

Year 2: Physics 2000A, 2005A, 2010B, 2015B (Math 2000R or other 2000-level math), science elective.

Year 3: Two 3000-level Physics classes; one additional Physics class is recommended; electives. A recommended selection includes 3140A or 3170B, 3180A, 3000A and 3010B.

BSc Major in Physics, with Diploma in Engineering

The physics content of this programme might be as follows:

Year 1: Physics 1100R

Year 2: Physics 2000A, 2005A, 2010B, 2015B

Year 3: Physics 3160A, 3170B, 3340A, Physics elective. Other possibilities exist.

For the remainder of the programme, consult the Engineering Department.

Geophysics

For those interested in Geophysics, refer to classes 2050B, 3130B, 4270A, 4280B, and 4290A, listed under Earth Sciences.

Diploma in Meteorology

The one-year Diploma in Meteorology programme consists of the following five

classes: Physics 4500A/4510B, 4520A, 4530B, 4540A/4550B; Oceanography 4411A/4412B and 4120A, Oceanography 4515C, or an approved elective.

Canadian students admitted to this programme are eligible for consideration for AES-NSERC Studentships in Meteorology, which, for 1992-93, were valued at \$8,000 per annum.

For admission into this programme, which has a limited enrolment, a general BSc degree in Physics or other appropriate subject is required. A strong background in Physics and Mathematics is necessary, and classes taken should also include Statistics and Computing Science. For students enrolled in a BSc programme at the Dalhousie, the following classes are recommended: Physics 1000R, 2000A, 2005A, 2010B, 2015B, 3180A/3170B; Math 1000A.1010B, 2000R, 2030A/2040B, 2070A/2080B, 3110A/3120B; and Computing Science 1400/1410B.

After completion of the Diploma programme, students are eligible for admission into a graduate Atmospheric Science programme at Dalhousie.

Classes Offered in Physics

Classes marked * are not offered every year. Please consult the timetable on registration to determine if this class is offered.

PHYC 1000R Survey of Physics: A survey of physics is not normally accepted as a prerequisite to advanced classes in physics. It is designed for students in arts and science who want to be exposed to a wide range of topics in physics. Topics covered include motion, force, momentum, energy, heat, electricity and magnetism, waves, light, relativity, quantum theory and atomic radiations, the atomic nucleus and nuclear reactions, astrophysics and cosmology.

This course requires a reasonable background of high school mathematics, i.e. algebra, trigonometry, geometry, but not calculus. Problem sets are assigned each week, for which help may be obtained in a scheduled afternoon tutorial hour and through the Physics Resource Centre at other times.

Instructor: C. G. White

Format: Lectures 3 hours, tutorial 1 hour

Prerequisites: Familiarity with algebra, graphs and trigonometry

Text: Jones/Childers, *Contemporary College Physics*

Enrolment: 110

PHYC 1100R Introduction to Physics: Primarily for students interested in the physical sciences. Students beginning this

class should be familiar with algebra, graphs and trigonometry, and should be taking calculus (Math 1000A/1010B) concurrently. The class concentrates on three main areas: mechanics, oscillations and waves, electricity and magnetism. As far as possible, the basic ideas are introduced through in-class demonstrations, enabling students to relate the verbal and mathematical descriptions to events in the real world. In addition, students are able to explore the physical world via labs every second week. **Note:** Section 03 is for Engineering students only.

Instructors: M. Calkin, D. Goble, B. Paton, M. Jericho, A. Simpson

Format: lecture 3 hours, lab 3 hours (number of labs = 13)

Prerequisites: Students should have a background in Physics equivalent to the Nova Scotia XII level.

Text: Serway, *Physics for Scientists and Engineers*, 3rd ed.

Enrolment: 450

SCI 1200R: Science for Non-Science Students: An Overview of the Cosmos, Earth, and Life: The class meets the science distribution requirement for BA students. There are no prerequisites and the class does not count as a prerequisite for any other science class. Students are introduced to selected concepts central to each of the disciplines of Geology, Biology, and Physics, and the origins of our universe, Earth and life on Earth. Emphasis is placed on developing an understanding of the scientific method, its limitations, and its application in society. The principles will be related to environmental concerns. For example the properties of light and radiation are applied to a discussion of global warming. The principles involved in ocean and atmospheric circulation are used to understand present problems of climate and pollution. Biological principles are applied to understand the consequences of changing habitats on biodiversity.

Instructors: E. Angelopoulos, P. Reynolds, R. Marsh

Cross-listings: ESCI 1200R, PHYS 1200R, BIOL 1200R

PHYC 1280A/1280B Introduction to Physics: These two half classes are, as a pair, equivalent to PHYC 1100R. They are available ONLY to accommodate special circumstances; permission from the Department is required.

PHYC 1300R Physics In and Around You: An Introduction to physics for students in biology, and those preparing for medicine, dentistry and allied health sciences. It is accepted as a prerequisite to advanced classes in physics when combined with Mathematics 1000A and 1010B. After

introducing basic concepts in physics, every opportunity is used to apply these concepts by using realistic biological examples, e.g. forces and torques are directly related to muscle action, fluids to blood circulation, sound to hearing.

Instructor: G. F. O. Langstroth
Format: lecture 3 hours, lab 3 hours
Prerequisite: Students beginning this class should be familiar with trigonometry and algebraic equations.

Text: Giancoli, *Physics*, 3rd ed
Enrolment: 150

PHYC 1450R Astronomy: The Evolving Universe: This class meets the science distribution requirements for BA students.

The class does not count as a prerequisite for any other science class. Our world, in the largest sense, is our universe. This class will start by looking at the static night sky, the properties and numbers of stars that are visible. Then stellar evolution, leading up to supernovae, pulsars and black holes, will be studied. Further topics covered will go outward, covering the origin and evolution of the universe itself, and then inward to examine the Solar System. The level is non-calculus with a minimum of mathematics. Included will be some of the historical evolution of the perception of our universe.

Instructor: W. Zukauskas
Format: lecture 3 hours
Prerequisites: None
Text: Zelik, *Astronomy: the Evolving Universe*, 6th ed.
Enrolment: 150

Exclusion: Credit will be given for only one of Physics 1450R and 2450R.

PHYC 1500A/1550B Principles of Physics: Topics covered are similar to PHYC 1100R but are aimed at a deeper understanding. Whenever possible, general techniques such as dimensional analysis, model construction, approximation, analogy, special coordinate frames and symmetry considerations will be illustrated. Appropriate everyday phenomena will be selected for discussion.

This class is intended primarily for those students who anticipate taking an honours programme in the physical sciences. Students enrolling in this class must have attained high standing in high school physics and mathematics, and should seek prior permission from the departmental advisor. Concurrent enrolment in Mathematics 1000A and 1010B, or in Mathematics 1500R is advised.

Instructor: D. Kiang
Format: lecture 3 hours, lab 3 hours
Prerequisites: See above description

Text: Tipler, *Physics for Scientists and Engineers*, 3rd ed.
Enrolment: 25

PHYC 2000A Oscillations and Waves: Topics discussed include the description of sinusoidal oscillations, vibrations of different physical systems, resonance, standing waves, wave synthesis, travelling waves, interference and diffraction.

Instructor: A. M. Simpson
Format: lecture 3 hours, lab 3 hours
Prerequisites: PHYC1100R or 1500A/1550B, a 1000-level calculus class, or permission of the instructor.

Text: French, *Vibrations and Waves*
Enrolment: 60

PHYC 2005A Mechanics and Relativity: Topics include coordinate systems, collisions in three dimensions, angular momentum, rigid body motion, central force motion and orbits, the special theory of relativity, relativistic coordinate transformations, relativistic momentum and energy.

Instructor: D. A. Tindall
Format: lecture 3 hours, tutorial 3 hours
Prerequisites: PHYC1100 or 1500A/1550B, a 1000-level calculus class, or permission of the instructor.

Text: Kittel, Knight, Ruderman et al., *Mechanics* (Berkeley Physics Course), 2nd ed.
Enrolment: 60

PHYC 2010B Electricity and Magnetism: This class begins by studying electrostatics, electric fields and electric potential, then conductors in static fields, energy storage and capacitance. Magnetic fields and forces, electromagnetic induction and Maxwell's equations are discussed.

Instructor: B.L. Blackford
Format: lecture 3 hours, lab 3 hours
Prerequisites: PHYC1100R or 1500A/1550B (PHYC2000A and PHYC2005A recommended), and a 1000 level calculus class
Text: Purcell, *Electricity and Magnetism*

Enrolment: 60

PHYC 2015B Modern Physics: This introduction to quantum physics discusses some of the difficulties of classical physics in explaining blackbody radiation, photoelectric effect and the Compton effect. The concept of wave-particle duality is introduced for light and particles, de Broglie waves and electron diffraction are discussed. The Schrodinger equation is applied to one-dimensional examples. The concept of tunneling is used to explain field emission, alpha decay, and the scanning tunnelling microscope.

350 Physics

Applications of modern physics are discussed and illustrated through the tutorial sessions.

Instructor: D. Labrie
Format: lecture 3 hours, tutorial 3 hours

Prerequisite: PHYC1100R or 1500A/1550B (PHYC 2000A and PHYC 2005A recommended) and a 1000 level calculus class

Text: Serway, Moses, and Moyer, *Modern Physics*.

Enrolment: 60

***PHYC 2220A Radiation Physics:** Topics include the nature and origin of ionizing radiation and its production process, radioactive decay, and the interaction of radiation with matter.

Instructor: G. F. O. Langstroth
Format: lecture 3 hours

Prerequisite: First year physics or the approval of the instructor
Johns & Cunningham, *The Physics of Radiology*, 4th ed.

Enrolment: 50

*Offered in alternate years beginning in 1992-93.

***PHYC 2230B Radiation Physics,** Applications: Emphasis is on applications in biology, physiology and medicine; discussion will focus on methods and devices employed for measurement of radiation and for the investigation and treatment of living organisms. Particular attention is given to imaging techniques for the examination of internal organs.

Instructor: G. F. O. Langstroth
Format: lecture 3 hours
Prerequisite: First year physics or approval of the instructor, with preference given to students who have taken Physics 2220A

Text: Same as PHYC2220A
Enrolment: 50

*Offered in alternate years beginning in 1992-93.

PHYC 2450R Astronomy: An introduction to astronomy for science students. Topics discussed include: the observation and exploration of the planets, the origin and evolution of stars (including white dwarfs, pulsars, quasars, black holes), the structure of galaxies, and cosmology.

Instructor: TBA
Format: lecture 3 hours
Prerequisite: One first-year science class
Text: Kaufmann, *Universe*, 4th ed.
Enrolment: 90
Exclusion: Credit will be given for only one of Physics 1450R and 2450R.

SCI 3000R Science Fundamentals: An interdisciplinary class that stresses the motivations, methodologies, and responsibilities of scientists, and provides extensive formal instruction in written and oral communication of scientific material. For details, see main calendar entry "Science, Interdisciplinary." The status of this class (elective, minor, or major credit) varies from department to department; check with your undergraduate advisor.

PHYC 3000A and 3010B Experimental Physics: Designed to give students a chance to do non-set experiments and thereby encounter and solve, on their own, the problems of experimentation. As the number of experiments is small (four to six), students should achieve a real understanding of a few physical phenomena. Topics cover a wide range of fields such as atomic physics, nuclear physics, solid state physics and electronics. A measurement of one of the fundamental constants such as α , G or e is required. Other than this, the student is free to choose the field of experimental study.

Instructor: R. A. Dunlap
Format: lecture 3 hours, lab 6 hours
Prerequisites: PHYC2000A, PHYC2005A, PHYC2010B and PHYC2015B.

Text: Dunlap, *Experimental Physics: Modern Methods*, 1st ed.

Enrolment: 20

PHYC 3090A or B Advanced Classical Mechanics: Topics include: central force motion, the principle of virtual work, Lagrange's equations, the principle of least action, Hamilton's equations, canonical transformations, Hamilton-Jacobi equation.

Instructor: M. G. Calkin
Format: lecture 3 hours
Prerequisite: PHYC2005A
Enrolment: 25

PHYC 3140A Introduction to Quantum Physics: The experimental basis of the wave-particle duality of light is discussed and the existence of diffraction patterns for particles is used to motivate the construction of wave equations for particles. The determination and interpretation of solutions of Schrodinger's equation are illustrated by simple examples. The three dimensional Schrodinger equation is discussed, with special emphasis on the hydrogen atom. The concept of electron spin is also introduced.

Instructor: D.B.I. Kiang
Format: lecture 3 hours
Prerequisite: Mathematics 2000 or its equivalent; PHYC2015B
Text: Morrison, *Understanding Quantum Physics*

Enrolment: 25

PHYC 3160A Topics in Physics: An introduction to thermodynamics and statistical mechanics.

Instructor: C.G. White
Format: lecture 3 hours
Prerequisite: PHYC 2005A, 2010B
Text: Sears and Salinger, *Thermodynamics, Kinetic Theory and Statistical Thermodynamics*
Enrolment: 30

PHYC 3170B Topics in Physics: This class is complementary to PHYC 3160A and also continues the application of quantum principles to various regions on modern physics begun in Physics 2015B. In this class, quantum principles will be applied to atoms, molecules, solids, nuclei, and elementary particles. Some special applications will include lasers, semiconductors, and nuclear fusion.

Instructor: C.G. White
Format: lecture 3 hours
Prerequisite: PHYC 2015B, 3160A
Text: Serway, Moses & Moyer, *Modern Physics*
Enrolment: 30

PHYC 3200A Thermodynamics: An introduction to the basic concepts and laws of classical thermodynamics. Topics include equations of state, heat engines, thermodynamic functions, and phase equilibrium.

Instructor: D.D. Betts
Format: lecture 3 hours
Prerequisites: Some knowledge of partial derivatives, e.g., Mathematics 2000R or its equivalent
Text: Callen, *Thermodynamics and An Introduction to Statistics*, 2nd ed.
Enrolment: 20

PHYC 3210B Statistical Mechanics: In this class the tools are developed to link the physical laws of the microscopic world to those of the macroscopic world, and the underlying atomic processes of the laws of thermodynamics are explored.

Instructor: H.J. Kreuzer
Format: lecture 3 hours
Prerequisites: PHYC3200A, or its equivalent; Mathematics 2000R, or its equivalent
Text: TBA
Enrolment: 20

PHYC 3340A Electronics: Topics include: carrier transport in semiconductors, properties of diodes and transistors, amplifiers, oscillators, modulation, demodulation and rectification, operational amplifiers, linear and nonlinear analog systems.

Instructor: S. T. Nugent

Format: lecture 3 hours, lab 2 hours
Prerequisites: PHYC2010B; or Mathematics 2000R or its equivalent.
Text: Smith, *Electronics*
Enrolment: 20

***PHYC3402A The Rise of Modern Science:** The modern world has been fundamentally altered by science and technology. In what ways? How has this come to be? This class will attempt to answer these questions by looking at the origins of modern science in the 16th and 17th centuries, its growth of popularity in the 18th, and the rise of the scientific profession and science-based industry in the 19th and 20th centuries.

Recommendation: This class is designed for students in the arts and sciences who have some interest in history and/or philosophy. Science students in particular should realize that a considerable amount of reading and writing will be required in this class.

Instructors: R. Ravindra (Comparative Religion)/J. Farley (Biology)
Format: lecture/seminar 2 hours
Prerequisites: There are no formal prerequisites, but students should be in their third year or above, and have at least a B average.

Text: Westphal, *The Construction of Modern Science*

Cross-listings: BIOL3402A, HIST3072A, CREL3502A

Enrolment: 20

*Not offered in 1992/93

PHYC 3440A or B Optics: Topics are selected from areas such as electromagnetic theory, interaction of light with matter, propagation of light, geometrical optics, polarization, interference, and diffraction.

Instructor: D. Labrie
Format: lecture 3 hours
Prerequisites: PHYC 2010B; MATH 2000R or its equivalent; The student should be familiar with vector analysis, Maxwell's equations, and the use of complex exponential functions.
Text: Hecht, *Optics*, 2nd ed.
Enrolment: 20

PHYC 3810B Microcomputers and the Real World: Subject material: measurement theory, modern sensors, microcomputer architecture, 68000 family of computers; software simulation of digital electronic circuits; machine language programming; assembly language and interfacing techniques; development of "intelligent" instruments.

Instructor: B. E. Paton
Format: lecture 3 hours, computer lab 3 hours
Prerequisites: PHYC2000A/2010B

Text: Southern, *The 68000 Book*
Enrolment: 30

PHYC 4000A or B Advanced Lab: This is a physics and engineering-physics laboratory class in which students in groups of two work largely on their own initiative. The student may select experiments from the fields of optics, acoustics, solid state devices, and low temperature physics. Detailed laboratory reports on the experiments are required and students are expected to demonstrate a good grasp of underlying physical principles.

Instructor: M. H. Jericho
Format: lab 6 hours
Prerequisite: Fourth-year standing in physics or permission from the instructor.

Enrolment: 12

***PHYC 4020B Special Topics in the History and Philosophy of Science:**

Instructor: R. Ravindra
Format: Seminar 3 hours
Prerequisite: 3rd year standing or above
Enrolment: 10

*This class is not given every year.

PHYC 4100A or B Electrodynamics: Topics include the wave equation and solutions, waves at metallic boundaries, the inhomogeneous wave equation, radiation from moving charges, scattering and dispersion.

Instructor: D.A. Tindall
Format: lecture 3 hours
Prerequisite: PHYC 2010B, 4160A and Math 3110A/3120B

Text: Griffiths, *Introduction to Electrodynamics*

Enrolment: 20

PHYC 4151A Quantum Mechanics: General formulation of quantum mechanics, illustrated by spin systems and one-dimensional problems; angular momentum, stationary states, time evolution; variational methods, WKB approximation, and path integrals.

Instructor: D.J.W. Geldart
Format: lecture 3 hours
Prerequisite: PHYC 3140A
Text: Townsend, *A Modern Approach to Quantum Mechanics*

Enrolment: 20

PHYC 4152B Quantum Mechanics: This is a continuation of PHYC 4151A. Path integral approach to quantum mechanics, angular momentum theory and applications; density operators, systematic development of time-independent perturbation theory; identical particles; and scattering theory.

Instructor: D. Klang
Format: lecture 3 hours
Prerequisite: PHYC 4151A

Text: Same as for PHYC4151A
Enrolment: 20

PHYC 4160A Mathematical Methods of Physics: Topics discussed include: complex variable theory, Fourier and Laplace transform techniques, special functions, partial differential equations.

Instructor: J. G. Cordes
Format: lecture 3 hours
Prerequisite: MATH3110A/3120B, or permission from the instructor.

Text: Arfken, *Mathematical Methods for Physicists*, 3rd ed.

Enrolment: 20

PHYC 4170B Topics in Mathematical Physics: This class is a continuation of PHYC4160A and deals with special topics in mathematical physics selected from areas such as the Green's function technique for solving ordinary and partial differential equations, scattering theory and phase shift analysis, diffraction theory, group theory, tensor analysis, and general relativity.

Instructor: J. G. Cordes
Format: lecture 3 hours
Prerequisite: PHYC4160A or permission from the instructor.

Text: Same as for PHYC4160A

Enrolment: 20

PHYC 4180A or B Nuclear and Particle Physics: This is an introductory class. Topics discussed include: nucleon-nucleon interactions, nuclear structure, gamma transitions, alpha decay, beta decay, nuclear reactions and elementary particle physics.

Instructor: J.G. Cordes
Format: lecture 3 hours
Prerequisite: PHYC3140A
Text: Frauenfelder & Henley, *Subatomic Physics*, 2nd ed.

Enrolment: 20

***PHYC 4220A Microcomputer-Based Instrumentation:** Subject material: Instrument design; analog to digital and digital to analog techniques; custom interfacing to sensors; algorithms; parallel and serial output data links; software testing and debugging; hardware testing and debugging; research project.

*This class is not offered every year.

Instructor: B. E. Paton
Format: lecture 3 hours
Prerequisite: PHYC3810A
Text: Zaks, *Microcomputer Interfacing*

Enrolment: 20

PHYC 4230A or B Introduction to Solid State Physics: An introduction to the basic concepts of solid state physics which are related to the periodic nature of the crystalline lattice. Topics include crystal structure, X-ray diffraction, phonons and

lattice vibrations, the free electron theory of metals, and energy bands.

Instructor: D. A. Tindall
Format: lecture 3 hours
Prerequisite: PHYC3140A or permission of the instructor.
Text: Kittel, *Introduction to Solid State Physics*
Enrolment: 20

PHYC 4311A/4312B Fluid Mechanics I/II: An introduction to the theory of fluid dynamics, with some emphasis on geophysically important aspects. Topics include: flow kinematics, equations of motion, viscous flow, potential flow and basic aerodynamics in the first term, and open channel flow, compressible rotating and stratified flows, hydrodynamic stability, convection and turbulence, in the second term.

Instructor: D. Kelly, A. Bowen
Format: lecture 3 hours; some laboratory experiments on stratified and rotating flows are included in the second term.
Prerequisite: A knowledge of mathematical physics
Cross-listing: OCEA 4311A/4312B
Enrolment: 15

PHYC 4411A Dynamic Meteorology I: The basic laws of fluid dynamics are applied to studies of atmospheric motion, including the atmospheric boundary layer and synoptic scale weather disturbances (the familiar highs and lows on weather maps). Emphasis will be placed on the blend of mathematical theory and physical reasoning which leads to the best understanding of the dominant physical mechanisms.

Instructor: TBA
Format: lecture 3 hours
Prerequisite: Permission of the instructor
Text: Dutton, *The Ceaseless Wind*
Cross-listing: OCEA 4411A
Enrolment: 20

PHYC 4412B Dynamic Meteorology II: The approach is the same as PHYC 4411A with emphasis placed on synoptic-scale wave phenomena, frontal motions, and global circulation. An introduction to numerical techniques and their use in weather forecasting models and studies of climate is included. Additional special topics are covered at the discretion of the instructor.

Instructors: O. Hertzman
Format: lecture 3 hours
Prerequisites: PHYC4411A or permission from the instructor
Text: Same as for PHYC4411A
Cross-listing: OCEA 4412B
Enrolment: 20

PHYC 4480A or B Optics: A continuation of PHYC3440A, dealing with coherence,

polarization, scattering by matter, the electromagnetic properties of matter, including crystals, reflection, refraction and double refraction.

Format: lecture 3 hours
Prerequisites: PHYC 3440A or B; registration requires prior departmental consent.
Enrolment: 15

PHYC 4480A or B Applied Group Theory: This inter-disciplinary half-class is intended for third and fourth-year undergraduates and first-year graduate students in Chemistry, Mathematics and Physics. Topics include: review of matrices, fundamentals of groups, normal subgroups, homomorphisms, representation, character, orthogonality, symmetry groups in crystallography, role of symmetry groups in quantum physics and chemistry, normal modes and molecular vibrations. For students enrolled in PHYC4480, there will be some additional reading.

Format: lecture 3 hours
Prerequisites: MATH 2000, 2030
Cross-listing: MATH 3320A or B
Enrolment: 15

PHYC 4500A Atmospheric Physics I: Main topics covered in this class are atmospheric thermodynamics and atmospheric radiation.

Instructor: D.D. Bette
Format: lecture 3 hours
Prerequisites: At least one 3rd year physics class, preferably thermodynamics.
Text: TBA
Cross-listing: OCEA 4500A
Enrolment: 20

PHYC 4510B Atmospheric Physics II: The major topic covered in this class is cloud physics. Other topics include atmospheric optics, atmospheric acoustics, lightning and radar techniques.

Instructor: D.F. Goble
Format: lecture 3 hours
Prerequisite: PHYC4500A
Text: Reference: Rogers, *A Short Course in Cloud Physics*; Betts, *Radar Observation of the Atmosphere*; Atmospheric Physics Readings from Scientific American
Cross-listing: OCEA4510B
Enrolment: 20

PHYC 4520A Introduction to Meteorology: This class provides the student with an understanding of the thermal structure of the atmosphere, air mass and frontal theory, and weather generating physical processes and their consequences. Other topics include atmospheric radiation, dynamic meteorology, climatology, and the physics of clouds and storms.

Instructor: Staff
Format: lecture 3 hours
Prerequisite: Permission from the instructor
Text: Wallace & Hobbe, *Atmospheric Science (An Introductory Survey)*

Cross-listing: OCEA4520A
Enrolment: 20

PHYC 4530B Introduction to Radiation and Climate: This class provides the student with an understanding of the origin, composition and thermal structure of the atmosphere and radiative transfer through clear and cloudy atmospheres. There will be some discussion of the general atmospheric circulation, radiative transfer at the ocean surface, and climate change.

Instructor: P. Chylek
Format: lecture 3 hours
Prerequisite: Permission from the instructor
Text: Peixoto and Oort, *Physics of Climate*

Cross-listing: OCEA4530B
Enrolment: 20

PHYC 4540A Synoptic Meteorology I: This class introduces principles and techniques of meteorological analysis, diagnosis of weather systems and prognosis of system motion and development. A brief review is presented of meteorological instrumentation, observational procedures, codes and analysis techniques essential to the study of the main subject matter. Atmospheric systems and processes are carried out during the tutorial-laboratory period.

Instructor: Staff
Format: lecture 2 hours, tutorial-laboratory 3 hours
Prerequisite: At least one third-year physics class

Cross-listing: OCEA 4541A
Enrolment: 15

PHYC 4550B Synoptic Meteorology II: This class extends the analysis and diagnosis of atmospheric dynamics and weather processes introduced in PHYC4540A. Modern statistical and computer methods and satellite techniques are discussed. Case studies of atmospheric systems and processes are carried out during the tutorial-laboratory period.

Instructor: Staff
Format: lecture 2 hours; tutorial-laboratory 3 hours

Prerequisite: PHYC4540A
Cross-listing: OCEA 4550B
Enrolment: 20

***PHYC 4650A/4660B Relativity and Cosmology:** A review of differential geometry will be given followed by an introduction to the general theory of relativity. Various topics will be discussed, including: linearized theory and gravitational radiation, spherically symmetric metrics and

the Schwarzschild Solution, gravitational collapse, black holes, and cosmology.

Instructor: TBA
Format: lecture 3 hours
Prerequisite: MATH 3050R or permission of the instructor

Cross-listing: MATH 4650/5650
Enrolment: 15

*This class is not given every year.

PHYC 4800C Research Project: Students with a good academic record and an interest in original research are encouraged to undertake a research project under the direction of an individual faculty advisor. Interim progress reports and a formal final report are required. The class grade will be based on an evaluation of these reports.

Instructor: Staff
Format: Independent research
Prerequisite: High academic standing and permission of the Chair of the Physics Department

PHYC 8890 Co-op 2nd Year Seminar (non-credit)

PHYC 8891 Co-op Work Term I

PHYC 8892 Co-op Work Term II

PHYC 8893 Co-op Work Term III

PHYC 8894 Co-op Work Term IV

Graduate Studies

The Department of Physics provides courses of study leading to MSc and PhD degrees. Areas of research include: solid state; geophysics; medical physics; low energy nuclear physics; low temperature physics; theoretical physics; atmospheric physics and oceanography. Consult the Graduate Studies Calendar, or contact the Graduate Co-ordinator for the Physics Department.

School of Physiotherapy

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Director

Joan M. Walker, Certs. Phys. Ther.(N.Z.),
DipTP, BPT, MA (Man), PhD (McM)

Faculty Advisors

D. Egan (Entry-level Co-ordinator)
G. Weinwright (Academic Clinical
Co-ordinator)

Academic Staff, 1992-93

Professors

David A. Egan, MCSP, DipTP, MSo (Western)
Lydia Makrides, MCSP, BPT (Saek), MSo
(Ottawa), PhD (McM)
Joan Walker, Certs. Phys. Ther.(N.Z.), DipTP,
BPT, MA (Man), PhD (McM)

Associate Professors

Cheryl L. Kozey, BPE (UNB) MSo (Waterloo),
PhD (Dal)
G.I. Turnbull, MCSP, DipTP, BPT (Man), MA
(Dal)

Assistant Professors

Sandra L. Curwin, DipPT, BSo(PT), MSo
(Dal), PhD (UCLA)
Marilyn MacKay-Lyons, BSo(PT) (Tor),
M.Sc.(PT) (USC)

Lecturer

John Jefferson, BA, BSc(PT) (Tor), MSo
(Waterloo)
Gail Weinwright, BSR (UBC)

Faculty Honorary Appointments To Clinical Facilities

Cheryl L. Kozey, BPE (UNB), MSo (Waterloo),
PhD (Dal), (Nova Scotia Sports Medicine
Clinic)

Honorary Appointments

R.A. Fox, MD, FRCP (C), Professor,
Department of Medicine
Kenneth C.W. Hill, MCSP, DipTP, MSo (Dal),
Associate Professor
T.J. Murray, MD, FRCP (C) Professor,
Department of Medicine
W.D. Stanish, MD, FRCS (C), Associate
Professor, Department of Surgery

Cross Appointments

J.M. Walker, Certs. Phys. Ther. (N.Z.),
DipTP, BPT, MA (Man), PhD (McM),
Associate Professor, Department of
Anatomy, Faculty of Medicine
Sandra L. Curwin, DipPT, BSo(PT), MSo
(Dal), PhD (UCLA), Dept. of Surgery, Faculty
of Medicine; School of Recreation, Physical,
& Health Education
L. Makrides, MCSP, BPT (Saek), MSo
(Ottawa), PhD (McM), School of Recreation,
Physical, & Health Education

Special Lecturers

A. Lee, DipPT, BSo(PT) (Dal)
E. Little, BSo(PT) (Dal)
S. MacKinnon, BPE (UNB), MSc (Dal)
S. Sanford-Smith, BSo, BSo(PT) (Dal)
J. Tasker, BSo(PT) (Dal)
M. Van Pelt, BSo(PT) (Colorado), MMedSo
(Emory)

Provincial Clinical Co-ordinators

J. O'Dea, BSc(PT) (McGill) Newfoundland
Karen Grotterod, BSo(PT) (Dal) New
Brunswick
T. Nicholson, BSo(PT) (Dal), Prince Edward
Island

Overseas Clinical Co-ordinators

I. Glenores, Queen's College, Glasgow,
Scotland
K. Nicholas, Queen Margaret College,
Edinburgh, Scotland
P. Drummond, Univ. of Ulster, Jordanstown,
Ireland

Clinical Research Associates

J.W. Kozey, MSo (Waterloo)
Dr. R. Stalker, MD (Dal)

Clinical Associates

Nova Scotia

S. Beaumont-Rudderham - Queen's County
Hospital, Liverpool
J. Beaver - Yarmouth Reg. Health Centre,
Yarmouth
J.G. Braehanico, MCSP - Camp Hill Medical
Center, Halifax
J. Cameron - Aberdeen Hospital, New
Glasgow
J. Everett, BSo(PT) (McG) - Northwood Care
Centre Inc., Halifax
K. Field - South Shore Regional Hospital,
Bridgewater
N. Franko - Soldiers Memorial Hospital,
Middleton
B. Langille - Colchester Reg. Hospital, Truro
L. Langley, BSo(PT) (Dal) - Physiotherapy
Atlantic, Halifax
S. Liengme, Dip. (CSP) - St. Martha's
Hospital, Antigonish
B. Lynch, Dip. Phys. Ther. (Alta.) - Dartmouth
General Hospital, Dartmouth

A. MacDermid, Northside Harbour View Hospital, Sydney Mines
 D. O'Leary - Fisherman's Memorial Hospital, Lunenburg
 S.E. Quackenbush, Dip. Phys. Ther. (Dal) - IWK Hospital, Halifax
 W. Roberts, (MSP) - St. Vincent Guest House, Halifax
 J.L. Scheffner, BSc PT (McGill) - N.S. Rehabilitation Centre, Halifax
 S. Sheppard - Cape Breton Regional Hospital
 J. Taeker - Southend Physiotherapy Clinic
 A. Waterbury, DipPT (Dal) - Valley Regional Hospital, Kentville
 D. White, BSc(PT) (Dal) - Highland View Regional Hospital, Amherst
 V.I. Zwering, Dip. Phys. Ther. (Dal) - Victoria General Hospital

New Brunswick

D. Baird, BSc(PT) (Dal) - NB Extra-Mural Hospital, Fredericton
 S. Banks, Dip PT (Dal) - Carleton Memorial Hospital, Woodstock
 C. Bédard, BSc(PT) (McGill) - Hotel Dieu St. Joseph, Tracadie
 G. Belanger, BSc(PT) - Campbellton Regional Hospital, Campbellton
 S. Bouché, BSc(PT) (Dal) - Chaleur Regional Hospital, Bathurst
 C. Dlotte, BSc(PT) - Sussex Health Center, Sussex
 P. Greechan, DipPT (CSP) - Dr. Everett Chalmers Hospital, Fredericton
 J. Hughes, Dip PT (Dal) - Monoton Hospital, Monoton
 M. Hunter, Dip (CSP) - Forest Hill Rehabilitation Center, Fredericton
 B. Kelr, BSc(PT) (Dal) - Worker's Rehabilitation Centre, Saint John
 M. Laviolette, BSc(PT) (Laval) - Dr. Georges L. Dumont Hospital, Monoton
 S. MacKinley, Dip PT (Manitoba) - Hotel Dieu Hospital, Chatham
 N. Martin, BSc(PT) (Mont) - Hôpital Stele Marie de Kent, Ste. Anne de Kent
 E. Morrison, Dip PT (Dal) - Miramichi Hospital, Newcastle
 C. Pelletier, BSc(PT) (UofT) - Edmonston Regional Hospital, Edmonston
 D. Phillips, BSc(PT) - St. Joseph's Hospital, Saint John
 K. Salmon, BSc(PT) (Dal) - Renova/Mount Pleasant Physiotherapy, Saint
 P. Savage, BSc(PT) (McGill) - Grand Falls General Hospital, Grand Falls
 M. Thompson, Dip (CSP) - Saint John Regional Hospital, Saint John

Newfoundland

K. Ambler, Dip. (CSP) - Western Memorial Hospital, Corner Brook
 A. Baird, Dip(PT) (Dal) - Hoyle-Eccasoni Complex, St. John's

J. Bennett, Dip(PT) (Dal) - General Hospital Corporation, St. John's
 S. Bird, Dip (CSP) - Dr. G.B. Cross Memorial Hospital, Clarenville
 N. Brown, Dip (CSP) - Carbonear General Hospital, Carbonear
 M. Butler, Dip. (CSP) - Grace General Hospital, St. John's
 B. Ellis, BSc(PT) (Dal) - Therapeutic Services, St. John's
 S. Hutohinson, BSc(PT) (Dal) - West Coast Physiotherapy, Cornerbrook
 A. Kavanagh, Dip (CSP) - Physiotherapy Associates, St. John's
 B. Koeki - St. John's Home Care Program, St. John's
 C. Mosher, BSc(PT) (Dal) - James Paton Memorial Hospital, Gander
 L. Patterson, BSc(PT) (UWO) - Bonavista Peninsula Health Centre, Bonavista
 E. Porter, Dip (CSP) - Sir Thomas Roddick Hospital, Stephenville
 R. Pullin, Dip (CSP) - Aware Physiotherapy Clinic, Cornerbrook
 G. Russell, Dip (CSP) - Central Newfoundland Health Care, Grand Falls
 M. Scott, Dip. (CSP) - St. Clare's, St. John's
 J. Squires, BSc(PT) (Boston) - Children's Rehabilitation Centre, St. John's
 L. Vardy - Nova Physiotherapy Ltd., St. John's
 A. Vivian-Beresford BSc(PT) (Dal) - Dr. Charles A. Janeway Child Health Center, St. John's
 K. Whelan, BSc(PT) (Dal) - Dr. Charles L. LeGrow Health Centre, Port-Aux-Basques
 K. Woodford, BSc(PT) (Dal) - Melville Hospital, Goose Bay

Prince Edward Island

S. Gallant, Dip (PT) (McGill) - Prince County Hospital, Summerside
 B. Hancock, BSc(PT) (Dal) - Western Hospital - Alberton Community Hospital, O'Leary
 A. Keuper, BSc(PT) (UVM) - Kings County Memorial Hospital, Montague
 T. Nicholson, BSc(PT) (Dal) - Queen Elizabeth Hospital, Charlottetown
 M. Rogers, BSc(PT) (Dal) - Summerside Physiotherapy Clinic, Summerside

Part II - Clinical Co-ordinators

Nova Scotia

L. Boyle - St. Martha's Regional Hospital, Antigonish
 J. Brewer, BSc(PT) (Dal) - Yarmouth Regional Hospital, Yarmouth
 J. Cameron, BSc(PT) (Dal) - Aberdeen Hospital, New Glasgow
 C. Clark, Cobequid Multi-Service Centre, Lower Sackville
 A. de Gooyer - NSRC, Halifax
 N. Demetre - Victoria General Hospital, Halifax

K. Field, DipPT (Dal) South Shore Regional Hospital, Bridgewater
 M. Fogarty, DipPT (Dal) - Sydney Community Health Centre
 K. Forester, Canadian Forces Hospital, Halifax
 N. Franko, Soldiers' Memorial Hospital, Middleton
 T. Heirn-Neima - Camphill Medical Centre, Halifax
 B. Langille, Colchester Regional Hospital, Truro
 G. MacPherson, Glace Bay General Hospital
 D. Murrant, St. Martha's Hospital, Antigonish
 D. O'Leary, Fisherman's Memorial Hospital, Lunenburg
 F. Orrell, Northside Harbour View Hospital
 H. Osborne - IWK, Halifax
 W. Roberts (MCSP) St. Vincent Guest House, Halifax
 M. Sutton, The PhysioClinic, Halifax
 D. Trickett, Glace Bay Community Hospital, Glace Bay
 D. White, DipPT (Dal) Highland View Regional Hospital, Amherst

New Brunswick

D. Baird - NB Extra-Mural Hospital
 C. Bédard - Hotel Dieu St. Joseph
 C. Diotte - BSc(PT) (Dal) - Sussex Health Centre
 S. Jensen - Moncton Hospital
 B. Keir - Worker's Rehabilitation Centre
 P. Marquis-Doucet - Chaleur Regional Hospital
 N. Martin - Hospital Stella maris de Kent
 S. Murner-MacKenzie - Saint John Regional Hospital
 E. Morrison - Miramichi Hospital
 M. Ouellette - Forest Hill Rehabilitation Center
 D. Paulin - Dr. Georges L. Dumont Hospital
 C. Peltier - Edmundston Regional Hospital
 D. Phillips - St. Joseph's Hospital
 S. Quenn - Hotel Dieu Hospital
 M. Rowen - Dr. Everett Chalmers Hospital
 K. Salmon - Renova/Mt. Pleasant
 M.J. Tremblay - Grand Falls General Hospital
 D. Wallace-Crabbe - Carleton Memorial Hospital

Newfoundland and Labrador

A. Baird - Hoyles-Ecoasoni Complex
 J. Bennett - General Hospital, Health Sciences Centre, St. John's
 S. Bird - Dr. G.B. Cross Memorial Hospital
 N. Brown - Carbonear General Hospital, Carbonear
 J. Croxson - Nova Physiotherapy, St. John's
 B. Ellis - Therapeutic Services, St. John's
 N. French-Grace - Grace General Hospital, St. John's
 S. Hutchinson - West Coast Physio Clinic
 A. Kavanagh - Physiotherapy Assoc., St. John's
 B. Koski - St. John's Home Care Program
 C. Mosher - James Paton Memorial Hospital, Gender

L. Patterson - Bonavita Peninsula Health Centre
 E. Porter - Sir Thomas Roddick Hospital, Stephenville
 R. Pullin - Aware Physio Clinic
 G. Russell - Central Newfoundland Regional Health Centre, Grand Falls
 J. Squires - Children's Rehab Centre
 A. Vivian-Beresford - Janeway Child Health Centre
 K. Whelan - Dr. Charles L. LaGrow Health Centre, Port-aux-Basques
 K. Woodford - Melville Hospital, Goose Bay, Labrador

Prince Edward Island
 S. Gallant - Prince County Hospital, Summerside
 B. Hiscook - Western Hospital-Alberton Community Hospital
 A. Keuper - Kings County Memorial Hospital
 T. Nicholson - Queen Elizabeth Hospital
 M. Rogers - Summerside Physiotherapy Clinic

Introduction

The School of Physiotherapy was established in 1963. A two-year programme leading to a Diploma in Physiotherapy was offered by Dalhousie, the course of study being followed by a compulsory five-month internship period prior to eligibility for licence to practise physiotherapy. This Diploma programme was terminated at the end of the 1976-77 academic year. In 1975 the Senate of Dalhousie approved the implementation of a four-year programme leading to a Bachelor's Degree. The BSc (Physiotherapy) degree which replaced the Diploma programme comprises a general Arts and Science first year with required subjects followed by three professional years of study as outlined. During this course of study clinical training is undertaken. In addition to the major commitment to graduate academically and clinically, highly qualified physiotherapists, the school also offers non-credit workshops and seminars as part of a continuing education programme for graduates in Physiotherapy.

The School also offered a post-diploma programme which enabled Diploma holders to obtain a BSc (Physiotherapy) degree, however the last students were admitted in the 1990-91 academic year.

Affiliated Institutions

At present clinical instruction and practice during the course of study is undertaken with the guidance of clinical instructors in a variety of placements including clinics in Newfoundland, New Brunswick, Nova Scotia and P.E.I. See preceding list for affiliated institutions. Clinical experience

is also obtained in other centres across Canada and in the U.K.

Field Experience

Throughout the course of study students learn to apply their academic knowledge in a variety of situations. During the summer following the second year of study a compulsory brief period of orientation is undertaken to familiarize the students with the practice of physiotherapy. During all clinical placements, students are engaged in clinical practice under the guidance of clinical instructors. During these clinical placements the student's performance is evaluated by the staff of the Physiotherapy Department in which they are practising and students must maintain a satisfactory level of performance together with demonstrated suitability to pursue a career in Physiotherapy. A compulsory period of clinical practice between the third and fourth years offers the student the opportunity to obtain experience across Canada and in Britain. The students choose specific placements from amongst clinical facilities associated with Dalhousie's School of Physiotherapy.

Clinical practice is also a requirement of the fourth year of study.

Career Opportunities

The profession of Physiotherapy (or Physical Therapy) offers a varied, interesting and worthwhile career to both men and women in a variety of settings. Upon graduation, traditionally most Physiotherapists have worked in hospital-based departments rotating through various areas of interest prior to becoming more deeply involved in any specific area. Increasingly, opportunities are available in rehabilitation centres, extended care units, special schools, or with local government agencies, industrial health units, sports clubs and private clinics. Alternatively, experienced physiotherapists may operate a private practice. Interested persons can pursue Graduate Degrees in related areas leading to careers in teaching and/or research. A number of graduate programmes in Physiotherapy are available at universities in Canada and an M.Sc.(Physiotherapy) is proposed for Dalhousie.

License to Practise Physiotherapy

Physiotherapists practising in Canada must be licensed with the appropriate Provincial Licensing Body. The school itself has no jurisdiction in matters related to licensing, and Dalhousie University cannot accept responsibility for changes in licensing

regulations which may occur from time to time.

The Canadian Physiotherapy Association (CPA), the national professional organization, recommends minimum academic and clinical curriculum content for membership. The degree course at Dalhousie University is designed to fulfil the present requirements by the time the students graduate. Currently, membership or eligibility for membership in the CPA entitles the Physiotherapist to apply for Provincial licensing through the appropriate provincial body. A Physiotherapy National Examination was implemented in 1993. Graduates are strongly advised to seek further information and clarification from the College of Physiotherapists of Nova Scotia.

Students' Society

The Physiotherapy Students' Society gives incentive to the students to participate in school, campus and community activities and to participate in both local and national professional activities.

Association Membership

Information regarding membership in the various Physiotherapy Associations can be obtained from the following sources: The Canadian Physiotherapy Association (890 Yonge St., 9th Floor, Toronto, Ontario, M4W 3P4); The Chartered Society of Physiotherapy (14 Bedford Row, London, WC1R 4ED, England); The American Physical Therapy Association (1111 North Fairfax St., Alexandria, Virginia, 22314, U.S.A.); The World Confederation of Physical Therapy, Secretary General (16/19 Eastcote Street, London, W1N 7PA, England); The Canadian University Service Overseas, (CUSO) (151 Slater Street, Ottawa, Ontario, K1P 5H6).

School of Physiotherapy Regulations

1. All students are required to observe the University regulations and Academic Regulations as described in this Calendar.
2. Regular and punctual attendance at classes is required of all students. When the work of a student becomes unsatisfactory or if attendance is irregular, the student may be required to withdraw from the School.
3. Promotion each year is contingent upon satisfactory academic and clinical performance.
4. Students whose clinical performance is unsatisfactory will be required to withdraw from the School.

5. Except in special circumstances students may not carry a course load in excess of the normal load as set down in the calendar of the School of Physiotherapy.

6. Students are normally required to take a full course load as prescribed by the School in order to complete the requirements for the degree. In special circumstances, and with the permission of the Committee on Studies, a student may undertake a reduced course load. In such cases the requirements for the degree must be completed within six years of initial registration.

Students who fail a class on two occasions are not permitted to repeat the class and thus must withdraw from the School of Physiotherapy.

Failed Year

The student is considered to have failed the year if the student has failed to meet the required GPA for that year. See University Regulations 19.1 and 20.2.

Credit Hours

Each full class is assigned a value of six credit hours, and each half class is assigned a value of three credit hours except where otherwise stated.

Grading System

In classes where professional skill acquisition and competence are required (PHYT 2021, 2041, 3000, 3010, 3020, 3030, 3050, 3081, 3082, 3500, 4070, 4071, 4072, 4080), the minimum passing grade will be a C. For classes which have distinct sections (PHYT 3020, 4070, 4071, 4072), each section must be passed with a minimum grade of C. In all other classes the passing grade is D.

Grade Point Average Requirements

The grade point average system is described in the Academic Regulations. School regulations relating to GPA apply to students whose initial registration in the School was in the Fall of 1990 or earlier (consult calendar of appropriate year).

Voluntary Withdrawal

Students who voluntarily withdraw from the School of Physiotherapy, having satisfactorily completed courses toward the BSc (Physiotherapy) degree, with the intention of returning at a later date are advised that re-acceptance is contingent upon there being an available place.

Appeal

A student wishing to appeal a decision based on School regulations should in the first instance attempt to resolve the issue with the instructor(s) concerned, before proceeding as per School Appeal Procedures. A copy may be obtained from the School office. See Academic Regulation 26.2.

Degree Programmes

BSc (Physiotherapy) Degree Programme

The programme for the BSc (Physiotherapy) Degree is composed of a minimum of four years of study at University.

Academic Requirements

First Year

During this year students are registered in the College of Arts and Science at Dalhousie or in an equivalent course of study at another University. Applicants are advised that a minimum C standing in each class (Dalhousie or equivalent) is required for consideration for admission into the School of Physiotherapy. An overall average of at least 70% is required. Possession of the minimum standing does not, however, guarantee admission owing to the competition for the limited number of places in the programme.

College of Arts and Science

The required course of study includes five full classes comprising two science classes (Chemistry, Physics or Biology), one social science class (Psychology, or Sociology and Social Anthropology), and two electives. All prerequisite courses must be completed by the end of the normal academic year preceding the year of anticipated admission to the School of Physiotherapy. It should be noted that in order to fulfil the science requirement the two classes must be in different areas of science, i.e. both cannot be concentrated in one area. Applicants with prerequisite courses that are over 10 years old are advised to take all prerequisite courses in order to qualify for admission consideration. Applicants with prerequisite courses that are between 6 and 10 years old are advised to take a prerequisite course in order to qualify for admission consideration.

Year 1: The pre-requisite courses at Dalhousie University are as follows: Two courses from Chemistry, Physics, or Biology. Acceptable courses are: Chemistry 1010, 1020, 1030R, 1040R; Biology 1000 or 1001; Physics 1000 or 1100 or 1300. One course from Psychology or Sociology and Social Anthropology. Acceptable Dalhousie

University courses are Psychology 1000 or 1010; Sociology and Social Anthropology 1200. The equivalent of two full Arts or Science electives. Students studying at Universities other than Dalhousie are requested to ensure that the pre-requisite courses they are taking are equivalent to the courses listed above by contacting the Registrar's Office. CPR (Cardiopulmonary Resuscitation) Certification must be completed by the end of Year 2.

Second, Third and Fourth Years: Students must obtain a minimum GPA of 2.0 in each of the final three years of study and an overall final GPA of at least 2.0. Additionally, promotion to the fourth year of study is contingent upon a satisfactory clinical report (passing grade "C" required) with regard to the summer clinical placement between the third and fourth years of study (PHYT 3500B).

Faculty of Health Professions Required Classes

Year II: Physiology 2030R, Anatomy 217R, Anatomy 216R, PHYT 2021A, PHYT 2041B, PHYT 2051A, PHYT 2061C, PHYT 2070B, PHYT 2080B, ANAT 210B, Four-week summer clinical orientation.

Year III: PHYT 3000A, PHYT 3010A, PHYT 3020B, PHYT 3030B, PHYT 3050B, PHYT 3061A, PHYT 3062B, Physiology 3110A, Physiology 3120A, Psychology 2120B, Elective, PHYT 3500B.

Year IV: PHYT 4021A, PHYT 4022B, HSA 4001A, PHYT 4060R, PHYT 4050B, PHYT 4070B, PHYT 4071A, PHYT 4072B, Statistics 1060A, elective.

Electives

All electives must be approved by the School of Physiotherapy. The required fourth-year elective is expected to be beyond the 1000 level and must be taken in the Fall Term.

Students who have successfully completed, prior to admission, classes equivalent to the required classes in the programme of study may apply for transfer credit through the Office of the Registrar.

Clinical Practicum

After the second year, students engage in a four week clinical orientation (May/June). Throughout the third and fourth years, students engage in clinical practice under the guidance of clinical instructors. A compulsory full-time period of clinical practice is undertaken for approximately seventeen weeks between the third and fourth years (PHYT 3500B). A compulsory period of clinical practice (PHYT 4060R) is a

requirement of fourth year. Students will be assigned clinical placements throughout the Atlantic provinces and across Canada. The cost of travel and lodging are the responsibility of the student. In some instances, a nominal stipend may be provided. Students must successfully complete all clinical placements in the sequence outlined herein. Students must have settled all financial obligations to the University prior to undertaking any period of clinical practice.

Post-Diploma Programme

In 1977, the Senate at Dalhousie University approved the implementation of a course of study which enables Diploma holders in Physiotherapy to obtain the BSc (Physiotherapy) degree. This programme is being phased out. The last year for admission to this programme was 1990-91.

Successful completion of this course of study does not automatically confer eligibility to license and practice physiotherapy. All admitted students are strongly advised to consult with appropriate licensing agencies regarding requirements for licensure or re-licensure.

Course of Study

The total number of credit hours required in the existing BSc (Physiotherapy) degree is 138. Students with a Diploma in Physiotherapy are allowed a total of 78 credit hours, and must therefore take 60 credit hours to complete the requirements for the degree. The course of study is normally completed within 5 years from the date of initial enrolment. A break in registration is permitted but does not extend the five-year limit. A minimum overall C average (cumulative GPA 2.0) must be achieved.

Required Classes	Credit Hours
Elective.....	3
PHYT 4010B Human Locomotion.....	3
PHYT 4021A Research Methods.....	3
PHYT 4022B Research Methods.....	3
PHYT 4030/HSA401A Physiotherapy Management and Professional Issues.....	3
PHYT 4120/4280/ Option or PT4070A.....	3
PHYT 4150/4130/ Option or PT4071B.....	3
PHYT 3120B Exercise Physiology.....	3
PHYT 3110A Neurophysiology.....	3
A Statistics.....	3
R Elective.....	6
Sub total	36
Plus 4 approved Electives.....	24
Total	60

All students must obtain approval of their total proposed course of study from the School. Students who possess university

classes in addition to their Diploma may apply for transfer credit. A minimum of five full classes must be taken at Dalhousie University. No work overload (more than 6 full courses) is permitted during an academic year. The School cannot guarantee that credits taken at another University will be equivalent to Dalhousie course offerings and therefore accepted as part of the degree requirements. See Academic Regulation 8.

Classes Offered

Year II Required Classes

PHYL 2030R: A full class in Physiology offered by the Department of Physiology, comprised of a lecture and laboratory series, which will be closely integrated with Anatomy 217R.

Instructor: J. Dudar
Format: Lecture/Lab 5 hours
Prerequisite: Year I
Enrolment: Restricted

PHYT 2021A Clinical Physiotherapy I: Introduction to the principles and clinical skills involved in therapeutic intervention, including effective communication skills; professional ethics and conduct; handling and mobilizing of patients; and use of ambulatory aids.

Instructor: M. MacKay-Lyons
Format: Lecture/Lab 5 1/2 hours
Co-requisite: PHYT 2061C; ANAT 217R
Enrolment: Restricted

PHYT 2041B Clinical Physiotherapy II: A continuation of PT 2021A with increasing emphasis on clinical problem solving and progressive exercise design.

Instructor: M. MacKay-Lyons
Format: Lecture/Lab 5 1/2 hours
Prerequisite: PHYT 2021A
Co-requisite: PHYT 2061C; ANAT 217R
Enrolment: Restricted

PHYT 2061A Kinesiology: This course will provide the student with the basic concepts associated with the study of human movement. The emphasis will be on the mechanical and physiological factors affecting normal human movements, although clinical examples are used to stress important concepts.

Instructor: C.L. Kozay
Format: lecture (3 hours), lab
Co-requisite: PHYT 2061C, ANAT 217R
Enrolment: Restricted

PHYT 2061C Clinical Structure & Function: Knowledge of gross anatomy of the human body and associated surface anatomy is used to appreciate the relationship of anatomical structures during functional activities and applied to the assessment of muscle and joint function.

Instructor: J. Tasker
Format: Lecture/Lab 3 hrs alternate weeks

Co-requisite: ANAT 217R
Enrolment: Restricted

ANAT 217R Gross Anatomy: 6 credit hours. The gross structure of the human body is studied region by region through the use of lectures, dissection and demonstrations in Radiological Anatomy.

Instructor: R.E. Clattenburg
Format: Lecture/Lab 7 hours
Prerequisite: Admission to School
Enrolment: Restricted

PHYT 2070A Microbiology: An introductory class in Microbiology offered by the Department of Microbiology within the Faculty of Medicine. Consult Department for further details.

Instructor: Staff
Co-requisite: PHYL 2030R, PHYT 2061C, ANAT 217R
Cross-listing: MICR 2020A

PHYT 2080B Pathology: An introductory class in Pathology offered by the Department of Pathology within the Faculty of Medicine. Consult department for further details.

Instructor: Staff
Format: 1 credit hr

ANAT 210B Neuroanatomy: A class in Neuroanatomy offered by the Department of Anatomy.

Instructor: D. Hopkins
Format: lecture/lab 3 hrs
Prerequisite: ANAT 216A
Co-requisite: ANAT 217R

ANAT 216A Human Histology: A histology class for physiotherapy students covering cells, tissues, and selected organs.

Instructor: H. Dikeon
Format: lecture 2 hrs/lab 3 hrs
Co-requisite: ANAT 217R

Summer Clinical Orientation:

Co-ordinator: G. Wainwright
Format: 4 weeks, 0 credit hrs

Year III Required Classes

PHYT 3000A Assessment: This course presents the student with both theory and practice in the physiotherapeutic aspects of the clinical assessment of musculoskeletal disorders.

Instructor: D. Egan
Format: lecture/lab 5 hrs
Prerequisite: successful completion of the Year II, BSo(PT) course of study and 4 weeks of clinical orientation
Enrolment: Restricted

PHYT 3010A Clinical Therapeutics I -

Orthopaedic Conditions: This course will provide the student with an overview of common orthopaedic conditions and their medical/surgical and physiotherapeutic management.

Instructor: S. Curwin

Format: lecture, lab, seminar 4 credit hours

Prerequisites: successful completion of the Year II BSc(PT) course of study and 4 weeks of clinical orientation

Enrolment: Restricted

PHYT 3020B Clinical Therapeutics III -

Rheumatology/Amputees: This course is designed to prepare the student for the understanding and physiotherapeutic management of patients with rheumatoid disease and the rehabilitative needs of patients with amputations.

Instructors: S. Sanford-Smith, E. Little

Format: lecture/lab 5 hrs

Prerequisites: successful completion of the Year II BSc(PT) course of study and 4 weeks of clinical orientation

Enrolment: Restricted

PHYT 3030B Clinical Therapeutics IV -

Neurological Conditions: This course provides the student with a foundation of knowledge and specialized techniques to employ in the physiotherapy assessment and management of clients with disorders of the nervous system.

Instructor: TBA

Format: lecture/lab, 3 hrs; 4 credit hrs

Prerequisites: successful completion of the Year II BSc(PT) course of study and 4 weeks of clinical orientation

Enrolment: Restricted

PHYT 3050A Clinical Therapeutics II -

Cardiorespiratory: This class provides the student with the knowledge and skills necessary for the management of patients with cardiac and respiratory conditions.

Instructor: L. Makrides

Format: lecture, Lab and clinical sessions; 4 credit hrs

Prerequisites: successful completion of the Year II, B.Sc. (PT) course of study and 4 weeks of clinical orientation

Enrolment: Restricted

Classes designated as Clinical Therapeutics I, II, III, IV, include lectures from the teaching staff of the Departments of Medicine, Surgery, Paediatrics, Neurosurgery, Obstetrics and Gynecology of the Faculty of Medicine, and these are integrated with the Physiotherapeutic procedures taught by the Faculty of the School. The topics covered

include conditions commonly encountered in orthopaedics, rheumatology, spinal cord injury and disease, central and peripheral nervous system lesions, medical and surgical chest conditions, vascular diseases, ante- and post-natal care together with the prevention and treatment of post-surgical complications.

PHYT 3061A Electro-Physical Agents in

Physiotherapy I: This course is designed to assist students to acquire skills and knowledge in the area of electro-physical agents. Topics covered include the theoretical and practical application of superficial heating and cooling, deep heating and phototherapy. The course will cover the applied physics; physiological basis and effects; indications and contra-indications; and dangers and precautions of cryotherapy, wax, moist heat, infrared radiation, ultrasound, short wave diathermy, microwave diathermy, ultraviolet light and laser bio-modulation.

Instructor: John Jefferson

Format: lecture 2 hrs, lab 3 hours

Prerequisites: successful completion of the Year II BSc(PT) course of study and 4 weeks of clinical orientation.

Enrolment: Restricted

PHYT 3062B Electro-Physical Agents in

Physiotherapy II: This course builds on the knowledge and skills acquired in PHYT 3061A. The course is designed to cover various therapeutic uses of electric currents. Course material will include the theoretical and practical application of electro-diagnosis, electrical stimulation and biofeedback, including the applied physics; physiological basis and effects; indications and contra-indications; dangers and precautions of electro-diagnostic testing, therapeutic electrical stimulation and electromyographic biofeedback.

Instructor: John Jefferson

Format: lecture 2 hrs, lab 3 hrs

Prerequisites: PHYT 3061A

Enrolment: Restricted

PHYL 3110B Neurophysiology:

The principles of neurophysiology and survey of current concepts of the organization and function of the mammalian nervous system are provided.

Instructor: R. Croll

Format: lecture/lab 4 hours

Prerequisites: Physiol 2030R

PHYL 3120A Exercise Physiology:

The student is given a thorough understanding of skeletal muscle physiology and insight into the short and long term response to work. The material is related to normal and pathological conditions.

Instructor: H. Wolf

Format: lecture/lab 4 hrs

Prerequisite: Physiol 203OR

PHYT 3500B Clinical Practicum: Summer clinical practicum. All students must undertake at least 17 weeks between Years III/IV in an approved clinical setting. Satisfactory clinical performance is mandatory (passing grade C required).
Co-ordinator: G. Wainwright
Format: 0 credit hrs

PSY 2120B Clinical Psychology: Consult Department

Year IV Required Classes

PHYT 4021A Research Methods: The course is designed to provide the students with the background necessary to understand the research process. Topics of particular interest to Physiotherapy research are discussed (i.e. Ethics in human research, single subject designs, group designs, etc.)
Instructor: C. Kozey
Format: lecture 3 hrs
Pre/Co-requisite: An approved course in statistics
Enrolment: Restricted

PHYT 4022B Research Methods: The course familiarizes students with the research process through the undertaking of a research project.
Co-ordinator: C. Kozey, faculty advisors
Format: few scheduled sessions, work with faculty advisor
Prerequisite: PT4021A
Enrolment: Restricted

HSA 4001A Health Services Management: The development and structure of the Canadian health care system are presented. The management cycle is taught with an emphasis on the effective management of human resources. Legal and ethical issues are explored in the context of Health Services Management.
Instructor: P. O'Brien
Format: lecture 3 hrs
Prerequisites: Required Year II and III PT Courses
Enrolment: Restricted

PHYT 4070A or B Clinical Therapeutics V - Part I: The purpose of this course is to further develop the ability to formulate and implement a reasoned physiotherapy management plan for patients with a variety of musculoskeletal problems. The course will focus on spinal and peripheral joint disorders and aims to develop expertise in patient assessment and management in specific areas by the expansion of knowledge and skills related to etiology, mechanisms, pathophysiology, treatment and other health care procedures.
Instructors: D. Egan, S. Curwin
Format: Lecture 4 hrs, Lab 2 hrs

Prerequisites: successful completion of Year III BSo(PT) programme of study and clinical practicums
Enrolment: Restricted

PHYT 4071A or B Clinical Therapeutics V - Part II: This course builds on knowledge and experience gained in PT3050 and PT3030. The purpose of this course is to further develop the ability to formulate and implement a reasoned physiotherapy management plan, in the specific areas of neurology and cardiac rehabilitation. The course aims to further develop expertise in patient assessment and management in these areas by expansion of knowledge and skills related to etiology, mechanisms, pathophysiology, treatment and other health care procedures.
Instructors: L. Makrides, G. Turnbull
Format: Lecture 4 hrs, Lab 2 hrs
Prerequisites: successful completion of Year III BSo(PT) programme of study and clinical practicums
Enrolment: Restricted

PHYT 4072 Clinical Therapeutics V - Part III: The purpose of this class is to further develop the ability to formulate and implement a reasoned physiotherapy management plan for patients with paediatric and geriatric problems. The class aims to further develop expertise in patient assessment and management by expansion of knowledge and skills related to etiology, pathophysiology, ergonomics, treatment, and other health care procedures.
Instructor: J.M. Walker
Format: lecture/seminar 4 hrs, lab 2 hours
Prerequisites: successful completion of Year III BSo(PT) programme of study and clinical practicums

PHYT 4050B Psychiatry: An understanding of common psychiatric disorders that students will meet in clinical practice is developed. The class is given by members of the Department of Psychiatry in the Faculty of Medicine.
Instructor: S. Devarajan
Format: lecture 3 hrs
Prerequisite: Psych 2120B
Enrolment: Restricted

PHYT 4060R Clinical Practice: All students must undertake at least 8 weeks in the practice of Physiotherapy in an approved setting and submit a Special Topics paper/project. Satisfactory clinical performance is mandatory prior to graduation (passing grade C required).
Co-ordinator: G. Wainwright
Format: 6 credit hrs
Prerequisites: successful completion of Year III BSo(PT) programme of study and clinical practicums

STATS 1060A Introductory Statistics:
Consult Department

Elective Classes

HLTH 3000B: Intra- and interdisciplinary trends in the conceptualization, empirical investigation and practical implementation of health promotion will be examined. Students will consider historical, present and future perspectives of specific health promotion issues. Learners will have opportunities to develop skills in analyzing factors influencing the delivery of health promotion within the Canadian health care system. The contribution of different health professions to the study of health promotion will be assessed and the effectiveness of a teamwork approach will be evaluated.

PHYT 3070A/3080B Directed Study: Under the guidance of a member of Faculty of the School of Physiotherapy a student may undertake a detailed study related to the theory or practice of physiotherapy or associated topics. A variety of subjects ranging from detailed literature surveys to more clinically oriented areas are available to the students; evaluation is based upon the collection and presentation of the material.

Co-ordinator: D. Egan

Format: Independent study - no scheduled hours

Prerequisite: Restricted to 3rd and 4th year physiotherapy students

Enrolment: Restricted

PHYT 3090B/NURS 4800B/PHAR 4960B/HEED 2260B Interdisciplinary Course in Human Nutrition: For class description see NURS 4800B

PHYT 4300A/4301B An Interdisciplinary Approach to Gerontology: See HLTH 4800A and HLTH 4910B for description.

Cross-listing: HEED 4498A/4499B, HLTH 4900A/4910B, LEIS 4498A/4499B, OCCU 4417A/4418B, PHAR 4960A/4970B, PHSE 4498A/4499B, SOSA 2060A.

Option Classes

Available to Post Diploma Students Only

Each Post Diploma student may take 2 option classes or PT4070/4071. These classes are related to detailed study of specific areas in Physiotherapy or related fields. Not all option classes are offered every year. Option classes are only available as distance education courses, to students located off-campus.

PHYT 4120A Gerontology and Geriatrics: This course explores the place of physiotherapy in the health care and health promotion of elderly persons.
Co-ordinator: A. Lee

PHYT 4130A or B Advanced Orthopaedics: This course provides the student with the opportunity to develop a reasoned approach to the treatment of selected joint disorders which are commonly encountered in practice. The philosophies of a variety of clinicians, detailed clinical examination and treatment will be studied, discussed and practised.

PHYT 4140B Sports Physiotherapy: This course introduces students to sports medicine physiotherapy and encompasses prevention, management and rehabilitation, both in the clinic and on the field.

PHYT 4150B Cardiac Rehabilitation: This class provides the student with the knowledge and skills necessary to prescribe an appropriate level of exercise for a cardiac patient and to examine the role of cardiac rehabilitation in the management of patients with coronary heart disease.
Co-ordinator: L. Makrides

PHYT 4280 Pediatric Development and Assessment: Examination of prenatal and postnatal development with emphasis on motor development, and assessment procedures in the infant and child.
Co-ordinator: J. Walker

Political Science

Location: Arts and Administration Building, 3rd Floor, Halifax, N.S.
Telephone: (902) 494-2396
Fax: (902) 494-1957

Undergraduate Advisors

Katherine Fierbeck - Undergraduate (494-6631)
 Brian Lee Crowley - Honours (494-6628)

Chair

Peter Aucoin (494-2392)

Professors Emeritus

J.H. Atkinson, BA, BEd (Sask), BSc (Lond), PhD (Tor)
 J.M. Beak, BA (Acadia), MA, PhD (Tor), LLD (Dal), LLD (St FX), LLD (RMC), FRSC
 E.M. Borgese, OC, DipMus (Zurich), LHD (MSVU)
 D. Braybrooks, BA (Harv), MA, PhD (Corn), FRSC
 J.G. Eayre, OC, BA (Tor), AM, PhD (Col), FRSC

Professors

P.C. Aucoin, BA (SMU), MA (Dal), PhD (Queen's)
 H. Bekvis, BA (Queen's), MA, PhD (UBC)
 R. Boardman, BSc, PhD (Lond)
 D.M. Cameron, BA (Queen's), MA, MPhil, PhD (Tor)
 T.M. Shaw, BA (Sussex), MA (East Africa, Prin.), PhD (Prin), (Director, Centre for Foreign Policy Studies)
 D.W. Stairs, BA (Dal), MA (Oxon), PhD (Tor) FRSC
 G.R. Winham, BA (Bowdoin), Dip. in Int. Law (Minn), PhD (NorthCar), (Eric Dennis Memorial Professor of Government and Political Science)

Associate Professors

D.W. Middlemiss, BA, MA, PhD (Tor)
 J. Smith, BA (McM), MA, PhD (Dal)

Assistant Professors

B.L. Crowley, BA (McGill), MSc, Ph.D (London)
 K. Fierbeck, BA (Aita), MA (York), PhD (Cantab)
 R.G. Finbow, BA (Dal), MA (York), PhD (London)
 F. Harvey, BA, MA, PhD (McGill)

What is Political Science?

Politics has been described as "Who Gets what, When, How, Why" in society. The

study of politics, or Political Science is one of the oldest academic disciplines known to humankind. In Ancient Greece political philosophers concerned themselves with creating a good society, and balancing justice with order. Today Political Scientists still study these matters, but the discipline has grown to encompass many aspects of government, such as parliaments, electoral processes and constitutions; or external relations, including issues of war, peace and poverty.

Political Science is important to society because, in an age of complex government, an educated citizenry is the best safeguard for democracy. Political Science is valuable for individuals who want to know more about the values, laws, institutions and policy mechanisms that govern their lives in society, and as well, the differences between their system of government and those in other countries. Beyond this, Political Science is an especially useful preparation for students who wish to pursue careers in teaching, law, public service or business.

Dalhousie University's approach to Political Science is a blend of traditional and modern analysis. The Department offers work in classical political philosophy; and most classes emphasize government structure and policy making, including domestic public administration and foreign policy. Other classes deal with political behaviour such as public opinion or interest group activity. Classes in modern research methods, including quantitative analysis, are also offered.

The admission requirements for Political Science are listed under the Faculty of Arts and Social Sciences. There are no additional requirements for Political Science beyond those of the Faculty.

Students majoring in Political Science are encouraged to seek advice from Professor Katherine Fierbeck, Coordinator of Major Programmes in developing a programme of studies. Students taking an Honours Degree should seek advice from Professor Brian Lee Crowley, Honours Coordinator. Professor David Cameron is the Coordinator of Graduate Studies.

For General Interest

Students who have not yet decided on a major, or are looking for an elective in Political Science, are advised to take one of the introductory classes. These are POL 1100R (various sections), and POL 1103R (which fulfils the writing class requirement). There are no prerequisites for these classes. Each also fulfils the introductory class requirement for Major, Advanced Major, and Honours programmes in Political Science.

Degree Programmes

Students concentrating in Political Science may take a major programme, advanced major, or honours programme. The degree requirements are spelled out in University and Faculty Regulations, and in department regulations outlined below. The specific classes to be taken in each individual programme are chosen in consultation with the relevant faculty adviser from the Department. Undergraduate programmes may emphasize one of the sub-fields of Political Science (Canadian Government and Politics, Comparative Government and Politics, Political Theory and Methodology, and International Politics and Foreign Policy) or may consist of a general selection of classes from the Department's offerings.

Honours Programme

An honours programme normally consists of a first-year level class and not less than nine nor more than eleven additional classes in Political Science. Although nine to eleven classes represents the range allowed under the general university regulations, the Department recommends quite strongly that the normal honours programme consist of nine classes past the first-year class, including the honours essay. The intent of this recommendation is to encourage our honours students to take supporting class work in related disciplines.

For the purposes of the honours programme the Department has designated six second-year classes as honours core classes. Five of these core classes represent the political science sub-fields of Canadian politics, comparative politics, political philosophy (two classes) and international politics and the fifth represents the methodological basis for each of the sub-fields. The six core classes by area are as follows:

Canadian politics: POL 2200R Canadian Government and Politics

Comparative politics: POL 2300R Comparative Politics

Political philosophy: POL 2400R Politics and Ethics or POL 2401R Ethics and Politics.

International politics: POL 2500R World Politics

Methodology: POL 2494R Introduction to Political Inquiry

An honours programme in political science includes:

- i) at least three core classes, of which one must be POL 2494R Introduction to Political Inquiry, and another must be either POL 2400R or POL 2401R;

- ii) at least four advanced classes at the third and/or fourth year level, including the honours essay.

The core class requirements are designed (1) to give breadth to the honours programme, (2) to provide all honours students with a grounding in the normative questions of the discipline as well as the foundations of empirical inquiry, and (3) to expose prospective honours students to the various sub-fields that may be chosen for emphasis in individual programmes.

Overall, these requirements leave a minimum of two optional credits, which may be taken at the second, third or fourth-year levels.

Normally, students will have taken POL 2400R or POL 2401R, and POL 2494R, with a grade of B or higher, before entering the Honours Programme. Therefore, students who think they may pursue an honours degree or certificate are strongly advised to complete their core-class requirements as early in their undergraduate careers as possible.

The honours essay is counted as one credit. It is prepared during the fourth year under the supervision of a faculty member. The essay shows the student's ability to develop a systematic argument with reference to pertinent literature and other such data or analytical materials as may be appropriate. The credit number for the honours essay is POL 4800R. Arrangements are made for honours students in the last year to meet their supervisor with some regularity to discuss and ultimately present the work represented in their essay.

Combined Honours

Several of the more common combined honours programmes are: Political Science and Philosophy; Political Science and History; Political Science and Economics; Political Science and Sociology; and Political Science and International Development Studies. Students interested in taking any of these combined honours programmes or in discussing other possible programmes should consult initially with the Honours Supervisor.

Advanced Major Programme

Students wishing to complete a 20-credit B.A. Programme with an Advanced Major in Political Science should plan to include the following classes among the first 10 of the 20 credits required for the Advanced Major degree:

- 1) English 1000R, or Kings Foundation Year Programme;
- 2) the equivalent of one full-year class in a second language, normally French;

- 3) the equivalent of one full-year class selected from the Life and Physical Science group specified in the Faculty calendar;
- 4) the equivalent of one-half credit in quantitative analysis or research methods. In consultation with the Department adviser (e.g., Math/Stats 1060A or B, or a research methods class from any of the social science departments, including Political Science);
- 5) POL 1100R, or POL 1103R, or POL 1501R and the equivalent of two other full-year classes in Political Science, both at the 2000-level;
- 6) the equivalent of one full-year introductory-level class in each of at least two of the following subjects: Economics, History, Philosophy, Sociology and Social Anthropology, and Psychology;
- 7) and the remaining 1 1/2 credits as electives.

The remaining 10 credits must be chosen in consultation with the Department's Coordinator of Major Programmes, and should reflect a concentration on one of the following four fields: Canadian Politics; Comparative Politics; International Relations; or Political Philosophy.

The equivalent of at least four of these remaining 10 classes must be in Political Science; of these, at least three must be beyond the 2000-level. Other classes will be selected as appropriate to the field of concentration from the disciplines of Classics, Economics, History, International Development Studies, Philosophy, Sociology and Social Anthropology, and Psychology. With Department approval, additional classes in a second language (normally French) may also be taken.

Major Programme

In order to meet the requirements of a major programme, a student must take at least four, but not more than eight, classes in political science in addition to an introductory class. All major students should take at least two full classes from among the second-year level offerings and these classes should be selected from at least two sub-fields. A minimum of two additional full classes should be taken from third-year level offerings.

Summer School Classes

The Department normally offers one of the introductory classes and at least one second-year class in the summer sessions. For details, see the University's summer school calendar.

Classes Offered

Class descriptions are listed under five headings:

- 1) Introductory
- 2) Canadian Government and Politics
- 3) Comparative Government and Politics
- 4) Political Theory and Methodology
- 5) International Politics and Foreign Policy

The first digit of each class number thus indicates year, or level, of class. Except for 1000-level classes, the second digit denotes the sub-field within which the class is listed.

No student may take more than one first-year class but some second-year classes require no prerequisites. The prerequisites listed with each class are intended to show the sort of preparation the instructor anticipates. A student will usually take one second-year class in a field before taking a 3000-level class in the same field. Students without the appropriate 2000-level may obtain admission to 3000-level classes only with special permission of the instructors of those classes.

Classes marked * are not offered every year. Please note that some classes listed may not be offered in 1992-93. Classes listed as "A or B" may be taught in either the first or second term. For final listings check with the Department office or the current timetable on registration.

(1) Introductory

There are usually two or three sections of POL 1100R, each a full-year class taught by a different instructor. The topics vary a little from section to section and from year to year. POL 1103R has a content similar to POL 1100R.

POL 1100R Section 1, Introduction to Government and Politics: Designed to develop a basic understanding of government and politics in liberal democratic states, but with the major emphasis on Canada, the class examines the concept of democratic government, the role and structure of governmental institutions, political mechanisms and processes, concepts and ideologies, and comparisons with alternative regimes.

Instructor: D.M. Cameron
 Format: Lecture 3 hours
 Prerequisites: None
 Enrolment: No Limit

POL 1100R Section 2, Introduction to Government and Politics: This class introduces the basic institutions of government, the processes of politics and the social environment which influences them. Different ideologies and competing interpretations of democratic government are discussed in the second term. The nature

and distribution of political power will be a principal theme, as students are helped to understand the fundamental debates within the discipline.

Instructor: R. Finbow
Format: Lectures 3 hours
Prerequisites: None
Enrolment: Limited to 120

POL 1103R Introduction to Government and Politics: The approach and format in POL 1103 is similar to that in POL 1100R above. This class is also designed, however, to serve as the Department's designated Writing Class.

Instructor: Staff
Format: Lecture 3 hours
Prerequisites: none
Enrolment: Limited to 80

POL 1501R Introduction to International Politics and Foreign Policy: To provide a framework for analysis and understanding of contemporary international events, this class deals with the variety of "actors" in world politics (principally but not exclusively states), and examines some concepts in the field. POL 1501R is recommended for students planning to take POL 2500R (World Politics) in their second year.

Instructor: staff
Format: Lecture 3 hours
Prerequisites: None
Exclusion: POL 1101R
Enrolment: Limited to 80

(2) Canadian

POL 2200R Canadian Government and Politics: The class examines the Confederation debate, 1864-67, and the constitution of the new federation, the British North America Act. It studies the Act's development via constitutional amendment and the practice of judicial review. The review of the Canada Act, 1982, completes this section of the class. In the second section, the class deals with governmental institutions, the Crown, cabinet government and Parliament. The third and final section covers elections, the electoral system and political parties.

Instructor: J. Smith
Format: Lecture 3 hours
Prerequisites: Introductory Political Science class or instructor's permission.

Cross-listing: Canadian Studies
Enrolment: Limited to 100

***POL 3206A or B Canadian Political Thought:** The class examines enduring controversies in Canadian politics. Examples include: the nature of Canadian federalism; partisanship and party government; parliamentary versus republican institutions; religion and politics. These controversies are

examined as they have been articulated in speeches, pamphlets and articles by people active in public life.

Instructor: J. Smith
Format: Seminar 2 hours
Prerequisites: POL 2200R
Enrolment: Limited to 25

POL 3206A or B Constitutional Issues in Canadian Politics: These are political issues that possess an important constitutional dimension. They include judicial review and the role of the Supreme Court of Canada, constitutional amendment, the representation formula, the Charter of Rights and Freedoms, language rights and the Crown.

Instructor: J. Smith
Format: Seminar 2 hours
Prerequisites: POL 2200R
Enrolment: Limited to 25

***POL 3212A or B The Politics and Government of Nova Scotia:** Research papers prepared by the class form the basis for analyzing and appraising the functioning of Nova Scotian political institutions.

Instructor: Staff
Format: Seminar 2 hours
Prerequisite: POL 2200R
Enrolment: Limited to 25

POL 3214A or B Quebec Politics: This class is an examination of the historical, sociological, linguistic, cultural and political position of modern Quebec within Confederation. It will draw on a wide range of sources, including film, theatre, literature and music as well as the standard texts. A knowledge of spoken and written French would be helpful.

Instructor: B. Crowley
Format: Seminar 2 hours
Prerequisite: POL 2200R
Enrolment: Limited to 25

POL 3216A or B Local and Regional Government: The unique character of municipal government is examined in terms of its historical evolution and present structure and operation. Special attention is given to city government and to recent reforms at the regional and metropolitan level.

Instructor: D.M. Cameron
Format: Lecture & Discussion 2 hours
Prerequisite: POL 2200R or equivalent
Cross-listing: Canadian Studies
Enrolment: Limited to 25

POL 3220A or B Intergovernmental Relations in Canada: The territorial division of political power and the relations that have developed between governments are considered, with emphasis on the impact on policy outcomes.

Instructor: H. Bakvis
Format: Seminar 2 hours

Prerequisite: POL 2200R or Instructor's permission

Cross-listing: Canadian Studies
Enrolment: Limited to 25

***POL 3224A or B Canadian Political Parties:** The Canadian party system, viewed as an integral part of the entire political system, presents a number of interesting questions for exploration, such as the alleged fickleness of voters, the role of party leaders, and the manner in which parties contribute to Canadian democracy. The particular themes emphasised will vary from year to year.

Instructor: H. Bakvis

Format: Lecture & Discussion 2 hours

Prerequisite: POL 2200R or instructor's permission. Students will find it helpful to have some background in statistics or methodology, such as POL 2494R.

Cross-listing: Canadian Studies

Enrolment: Limited to 25

***POL 3233A or B Canadian Political Economy:** This seminar class, for graduates and senior undergraduates, will survey the major themes and perspectives in the literature on Canadian political economy. It will introduce students to the traditional staples, metropolitan-hinterland, Laurentian and frontier approaches. It will survey contemporary perspectives - pluralist, elitist, neo-Marxist, and institutionalist. The nature of Canada's economic development, the role of the state in economic life, and the relative importance of commercial, industrial, resource and tertiary sectors will be examined. Canada's imperial and continental relationships, the debate over free trade, cultural and economic nationalism, and Canada's contemporary position in a global political economy will also be considered. Other themes include the position of women, the welfare state in crisis, industrial relations, native and immigrant communities, environmental politics and the impact of political economy on national unity.

Instructor: R. Finbow

Format: Seminar 2 hours

Prerequisite: Open to graduate students and senior undergraduates, who have completed classes on Canadian politics, or permission of the instructor.

Enrolment: Limited to 25

***POL 3235A or B Regional Political Economy in Canada:** The class surveys the interaction between politics and economics in Canada with emphasis on the question of regional development. It will canvass competing explanations for differences in economic development among Canada's regions with special emphasis on Maritime economic

problems, highlighting both the political sources of regional disparities and continuing efforts to rectify them. Distinctive Western, Quebec and Ontario concerns will also be covered. Seminars, for graduates and senior undergraduates, will feature student presentations and research projects.

Instructor: R. Finbow

Format: Seminar 2 hours

Prerequisite: Open to graduate students and senior undergraduates, who have completed classes on Canadian politics, or permission of the instructor.

Cross-listing: Canadian Studies

Enrolment: Limited to 25

***POL 3245A or B The Judicial System and Canadian Government:** (Not offered in 1993/94)

POL 4204R Advanced Seminar in Canadian Government: The focus of the class is on the institutions and processes of parliamentary government and the federal system of government in Canada. Topics in the first term include responsible government; party government; electoral system; legislative processes; senate; cabinet; pressure groups; crown corporations and regulatory agencies; accountability; charter of rights; media. Topics in the second term include the ideas of interstate and intrastate federalism; judicial interpretation and the Supreme Court; executive federalism; federal-provincial fiscal arrangements; the 1982 constitutional amendments.

Instructor: P. Aucoin (First term) and D.M. Cameron (Second term).

Format: Seminar 2 hours

Prerequisite: Open to Honours students in their fourth year and to graduate students.

Cross-listing: Canadian Studies

Enrolment: Limited to 15

***POL 4226B Interest Groups: Function and Management:** This class will attempt a systematic examination of the function and management of interest groups in Canada and, to a lesser extent, other western countries. It will begin by considering the functions such groups perform for their supporters on the one hand and, on the other, the role they play in (1) maintaining political systems; (2) securing and modifying public policy, and (3) implementing programmes. It will explore the ways in which their structures and behaviour patterns vary according to the resources of the groups themselves, the nature of their concerns and the demands of the political/bureaucratic systems in which they operate. An important feature of the class will be a discussion of the internal management of groups. This discussion will include a review of how

membership is secured and retained how group resources are obtained and applied; the role of professional staff in developing group positions and in interacting between the interest group and government officials. In conclusion the class will examine the role of interest groups in policy processes and the relationship between that role and the prospects for democracy in western politics.

Instructor: A.P. Pross
 Format: Seminar 2 hours
 Prerequisite: POL 2200R or Instructor's permission
 Cross-listing: Canadian Studies
 Enrolment: Limited to 25

POL 4240A Policy Formulation in Canada: A comprehensive examination of the three critical questions in the study of policy formulation in Canada: 1) The function of the state; 2) The question of why governments develop policies; and 3) The means by which governments authoritatively develop policies. The discussion links these variables with a macro level analysis of the scholarly approach to decision-making. The emergence of tension resulting from the development of superindustrial society and from regionalism in the Canadian community provides policy problems on which the general theoretical analysis is hinged.

Instructor: P. Brown
 Format: Seminar 2 hours
 Prerequisite: Open to Honours students in their fourth year and to graduate students.
 Cross-listing: Canadian Studies
 Enrolment: Limited to 15

POL 4241B Introduction to Policy Analysis: This class examines four aspects of policy analysis: (1) The role of the analyst in modern government; (2) The analyst's working environment; (3) Techniques used in carrying out research and preparing position papers; (4) and the analyst's responsibilities to government and to the public in determining what information should reach decision-makers.

Instructor: A.P. Pross
 Format: Seminar 2 hours
 Prerequisite: POL 4240A or instructor's permission
 Cross-listing: Canadian Studies
 Enrolment: Limited to 15

(3) Comparative

POL 2300R Comparative Politics: The methodology and scope of comparative politics including an analysis of institutions and behaviour is examined through general overviews and more detailed studies of selected Western liberal democratic, Communist and Third World countries. Topics include presidential and parliamentary

regimes; theories of the state; political culture, ethnicity and nationalism; and policy outcomes.

Instructor: Staff
 Format: Lecture 3 hours
 Prerequisite: Introductory political science class or Instructors' permission
 Enrolment: Limited to 100

***POL 2327A or B Women in Western Political Thought:** The role of women in political life has been vilified, praised or ignored by major thinkers. Pertinent texts will be read along with interpretations by modern feminists in order to assess why the formal political enfranchisement of women has not resulted in greater substantial equality.

Instructor: Staff
 Format: Lecture and discussion 2 hours
 Prerequisite: None
 Cross-listing: Women's Studies 2600A or B
 Enrolment: Limited to 45

***POL 3302A or B Comparative Development Administration:** Some analytical and normative issues of public administration in developing countries are examined including the scope of development administration as a sub-field of public administration; public sector organisation and management including public services, public enterprises, decentralisation and rural development, financial systems, human resource management, aspects of state economic management with Japanese and South Korean case studies; and institutional aspects of aid administration with CIDA and World Bank cases.

Instructor: staff
 Format: Seminar 2 hours
 Prerequisite: POL 2300R or equivalent or Instructor's permission
 Cross-listing: MPA 6780A or B International Development Administration.
 Enrolment: Limited to 25

***POL 3303A Human Rights and Politics:** Issues arising from the claim to rights and from alleged infractions of rights which continue to arouse a great deal of public controversy within individual states and also within the international community are examined by type and by the basis of the claims to such rights. The approach is comparative, and students undertake case studies relating to the general topics.

Instructor: Staff
 Format: Lecture & discussion 2 hours
 Prerequisite: POL 1100R or POL 1103R, and, preferably, POL 2300R or POL 2400R or POL 2401R; or with the permission of the instructor.
 Enrolment: Limited to 20

***POL 3304A or B Comparative Federalism:** A seminar class which examines the theory and practice of federalism within a comparative framework. The actual federations discussed depends in part on student interest but usually includes both established federal nations and those moving in that direction.

Instructor: H. Bakvis
Format: Seminar 2 hours
Prerequisite: POL 2200R or POL 2300R or instructor's permission
Enrolment: Limited to 25

***POL 3315A or B African Politics:** The diversity of states, politics, economy and society in post-colonial sub-Saharan Africa is examined in this seminar. Topics include theoretical approaches, economic frameworks, governmental regimes, structural adjustments, civil society, and inter-regional political economies, and selected aspects of policy such as economic reform, political liberalisation, women and development, drought and ecology, AIDS and health.

Instructor: staff
Format: Seminar 2 hours
Prerequisite: POL 2300R or equivalent or instructor's permission
Enrolment: Limited to 25

POL 3310A or B Approaches to Development: A survey of theories of and policies about change, dependence, underdevelopment, and inequalities. Particular emphasis on modernisation and materialist modes of analysis, and on orthodox and radical strategies of development. Topics treated include social contradictions (e.g., class, race and ethnicity), debt, structural adjustment, (de)industrialisation, self-reliance, human development, gender, technology, civil society, informal sectors, authoritarianism and ecology.

Instructor: T.M. Shaw
Format: Discussion and Seminar 2 hours
Prerequisite: POL 2500R or POL 2300R, or International Development Studies 2000R, or instructor's permission.
Enrolment: Limited to 25

***POL 3330A or B Politics in Latin America:** Latin America is an area in which public attention is rapidly growing. This course seeks to analyze the fundamental institutions and policies which have fashioned its development (and underdevelopment). Specific case histories will be examined to show the "unrevolutionary" nature of society and political structures, as well as the exceptions (Cuba and Nicaragua). Among other topics, the role of militarism, the

Doctrine of National Security, the abuse of human rights, the changing role of the Church, external involvement, the revolutionary tradition, and the structure of government, will be studied. The objective of the course is to provide a basic grasp of the central elements which have determined (and continued to determine) its troubled political life.

Instructor: staff
Format: Seminar 2 hours
Prerequisite: POL 2300R or instructor's permission
Enrolment: Limited to 25

POL 3379R U.S. Constitution, Government, and Politics: The purpose of this seminar class is to gain a thorough and critical understanding of the American political process. To this end, a series of topics are examined, beginning with the framing of the constitution and concluding with questions about political culture. There is considerable emphasis on formal and informal political institutions, especially political parties and elections.

Instructor: J. Smith
Format: seminar, 2 hours
Prerequisite: POL 2200R or POL 2300R or instructor's consent
Enrolment: limited to 25

POL 4301A or B Comparative Theory: This class examines two levels of theory utilized in the study of politics in different nations: 1) the major paradigms or approaches to political analysis, notably debates over methodology and knowledge, the nature of the state, etc.; 2) selected theoretical tools used to analyze specific elements of the political process, notably interest group and media influence, political culture and socialization, electoral and revolutionary regime change, political development and economic dependency, etc. The list of topics is subject to revision depending on the students backgrounds and interests.

Instructor: R. Finbow
Format: Seminar 2 hours
Prerequisite: Open only to graduate and fourth year honours students who have completed classes in Comparative politics; permission of the instructor required.
Enrolment: Limited to 15

(4) Theory and Methodology

POL 2400R Politics and Ethics: This class, formerly known as *Justice, Law and Morality (Regimes Version)*, is complementary to POL 2401R (*Ethics and Politics*). Hobbes is the only author treated in both classes. The class may be taken for credit before, after, or concurrently with the other class. Either class

satisfies the minimum requirement in political philosophy for an Honours degree in Political Science.

Why, and under what conditions, ought human beings to accept a state with coercive powers expressed in laws and otherwise? What are the proper ends of political association, and how can these be morally justified? What is a just regime? What is the best (or the least bad) regime? These are perennial questions addressed by the great political thinkers, and it is to answers put forward by Plato, Aristotle, Machiavelli, Hobbes, Rousseau, Burke, Tocqueville and others that we turn in this class.

Instructor: B.L. Crowley
Format: Lecture 2 hours
Prerequisite: None. One year of university work in Arts and Social Sciences is recommended as preparation, though first year students can succeed.

Cross-listing: PHIL 2270R
Enrolment: Limited to 80

POL 2401R Ethics and Politics: This class, formerly known as *Justice, Law and Morality (Concepts Version)*, is complementary to POL 2400R (*Politics and Ethics*). Hobbes is the only author treated in both classes. The class may be taken for credit before, after, or concurrently with the other class. Either class satisfies the minimum requirement in political philosophy for an Honours degree in Political Science. An overview of early modern and modern political thought, this class examines the bases of political obligation and the political requirements of justice. While the class surveys the works of political theorists from Hobbes to Habermas, the emphasis is upon the normative issues underlying much of today's political debate.

Instructor: K. Fierbeck
Format: Discussion 2-3 hours
Prerequisite: None. One year of university work in Arts and Social Sciences is recommended as preparation, though first year students can succeed.

Cross-listing: PHIL 2070R
Enrolment: Limited to 80

POL 2494R Introduction to Political Inquiry: A variety of methods employed in contemporary political analysis to explain political events are analyzed critically, including consideration of the general question of the requirements of explanation in political science. Causal explanation and problems in the development and verification of social scientific theory are emphasized. A particular substantive issue unifies discussion of the various methods of explanation and a

research project in that issue permits the use of some of the tools of analysis discussed in connection with social scientific theory.

Instructor: Staff
Format: Lecture and Discussion 3 hours
Prerequisite: Introductory Political Science class or instructor's permission.
Enrolment: Limited to 45

***POL 3430A or B The Political Philosophy of Plato:** It has been said that the history of western political philosophy merely constitutes footnotes to Plato. This seminar examines a number of problems posed for scholars in interpreting Plato's work. The main focus is a close critical reading of one or more of Plato's 'political' dialogues, but we shall also place Plato in his historical context, with regard to classical Greek political thought in general, and Plato's great student Aristotle in particular.

Instructor: B.L. Crowley
Format: Seminar 2 hours
Prerequisite: POL 2400R or 2401R or instructor's consent
Enrolment: limited to 25

POL 3431A or B The Political Imagination in Literature: After having looked at how the study of literature both complements and supplements the social scientific approach to understanding politics, the seminar will analyze the implicit and explicit treatment of a number of political themes in a list of works by both modern and classical novelists and playwrights ranging from Sophocles, Shakespeare and Dickens to Brecht, Sartre and Nalpaul.

Instructor: B.L. Crowley
Format: Seminar 2 hours
Prerequisite: POL 2400R or POL 2401R, or instructor's permission
Enrolment: Limited to 25

***POL 3435A or B Machiavellian Politics:** (not offered in 1993/94)

***POL 3445A or B Entitlement and Property:** How is the ownership of property justified philosophically? Beginning with the early modern theorists' accounts of private property, this seminar examines how the concept of "entitlement to property" has been influenced by the development of economic theory, democratic ideals, and contemporary political and economic relations.

Instructor: K. Fierbeck
Format: Seminar 2 hours
Prerequisite: POL 2400R or POL 2401R or instructor's consent
Enrolment: limited to 25

***POL 3475A or B Democratic Theory:** Democracy is an essential component of legitimacy for all western states: few would

be inclined to assert their "undemocratic" nature. But what are the *essential* characteristics of democracy; and to what extent must modern democratic theory remain grounded in nineteenth-century western liberal thought? While this course has a predominantly *theoretical* orientation, it will include an examination of the relations between democratic theory and economic production/redistribution; as well as an investigation into how democratic theory can be developed in non-western political contexts.

Instructor: K. Fierbeck
Format: Seminar 2 hours
Prerequisite: POL 2400R or POL 2401R or instructor's consent
Enrolment: limited to 25

POL 4479A or B Classical Liberalism: Nobel Prize winning economic and social philosopher F.A. Hayek is perhaps the most influential modern exponent of a number of the key doctrines of classical liberalism. Using Hayek's *Law, Legislation and Liberty* as a basic text, we will critically examine his ideas (and his critics') on subjects such as epistemology, economics, politics, coercion, social justice and liberty.

Instructor: B.L. Crowley
Format: Seminar 2 hours
Prerequisite: Normally, classes in philosophy or political science or economics; consult instructor.

Cross-listed: PHIL 4470A or B and ECON 4448A or B
Enrolment: Limited to 15

POL 4480A or B Social Choice Theory: Arrow's theorem brings together the theory of voting and welfare economics, seemingly leading both (and the theory of democracy as well) to ruin. This class will consider how to cope with the problem.

Instructor: Staff
Format: Seminar 2 hours
Prerequisite: Permission of the Instructor
Cross-listing: PHIL 4480A or B, ECON 4448A or B

POL 4496A or B Philosophy of the Social Sciences: This class will identify three active sides of social science - naturalistic, interpretative, critical. It will consider how, in method and sorts of questions, inquiries on the critical side reduce to a mixture of activities on the other two. It will then explore in detail the intimate relations between naturalistic and interpretative inquiries.

Instructor: Staff
Format: Seminar 2 hours
Prerequisite: Permission of the Instructor

(B) International

POL 2500R World Politics: A continuation of POL 1501R, this class examines techniques of statecraft, surveys the "assaults" upon order, justice and well-being of which the actors of world politics are capable, and explores the available "constraints" upon such actions afforded by international systems and methods.

Instructor: F. Harvey
Format: Lecture and discussion 2 hours
Prerequisite: Recommended for students who have taken POL 1501R in their first year, but open to others with an introductory political science class or instructor's permission.
Enrolment: Limited to 60

POL 3531A or B The United Nations in World Politics: The evolution of the United Nations from its early concentration on problems of collective security, through the period of preventive diplomacy and anti-colonialism, to its present role as a forum for the aspirations and demands of the Less Developed Countries is reviewed. The more distant future, and the continuing relevance of the United Nations in world politics, and how its role and objectives should be determined, are considered.

Instructor: T. Shaw
Format: Seminar 2 hours
Prerequisite: Class in international politics or instructor's permission
Enrolment: Limited to 25

POL 3535A or B The New International Division of Labour: This seminar provides an overview of the global political economy in the current post-Bretton Woods and -Cold War period. It treats the New International Division of Labour/Power from several theoretical and political perspectives, from comparative foreign policy to feminism. Issues addressed include the Newly Industrialising Countries, the Middle Powers and the Fourth World; new functionalism; popular participation; and alternative futures.

Instructor: T. Shaw
Format: Seminar 2 hours
Prerequisite: Class in international politics or instructor's permission.
Enrolment: Limited to 25

***POL 3537R Management and Conservation of Marine Resources:** This is an intensive programme on the problems of managing the multiple uses of the Exclusive Economic Zone. It covers the New Law of the Sea and its many implications for politics and management, the social, economic and technical aspects of managing living resources, non-living resources, shipping, ports and harbours, coastal management and the protection of the environment; national

legislation and required institutional infrastructure, regional cooperation and cooperation with international institutions.

Instructor: E.M. Borgese
Format: Seminar 2 hours
Prerequisite: Class in international politics or instructor's permission. Offered as a summer class only: consult instructor.

Enrolment: Limited to 25

***POL 3540A or B Foreign Policy in the Third World:** This seminar offers a comparative perspective on the political economy of foreign policy in Africa, Asia, the Middle East, and South America at the end of the twentieth century. Its focus is how such state and non-state actors in the South relate to the New International Divisions of Labour and Power given the demise of both Bretton Woods and Cold War global regimes. In addition to selective case studies of both large and small states - from Brazil, India, Indonesia, and Nigeria to Botswana, Jamaica, Kuwait, and Singapore - it treats formal and informal external relations, from regional intergovernmental institutions to non-governmental coalitions. It also examines new forms of regional conflict and cooperation, including guerrilla struggles and civil societies. It emphasises the incidence and impact of structural adjustment programmes and conditionalities along with the emergence of "new" issues such as debt, democracy, ecology, gender, refugees, and technology. A range of alternative approaches is identified and evaluated appropriate to the contemporary period of revisionism.

Instructor: T.M. Shaw
Format: Seminar 2 hours
Prerequisite: class in international politics or instructor's consent
Enrolment: limited to 25

***POL 3544A or B Political Economy of Southern Africa:** An introduction to the comparative politics, economic structures and international relations of Southern Africa, which provides a study of regional political economy with both empirical and theoretical significance. The primary focus is on regional conflict and change, especially on transformation and reaction, given the contemporary global context.

Instructor: T. Shaw
Format: Lecture and seminar 2 hours
Prerequisite: Class in international politics or instructor's permission.
Enrolment: Limited to 25

POL 3570R Canadian Foreign Policy: The seminar examines post-World War II Canadian foreign policy in three parts: (1) a detailed analysis of major policy developments, using the case-study approach; (2) an investigation

of selected recurrent and contemporary themes, issues, and problems, and (3) an investigation of the general factors that may help to "explain" the form and content of Canadian foreign policy, with particular reference to the institutions and processes through which policy decisions are made. The primary emphasis is on politico-security issues, although other subjects are also considered.

Instructor: D. Stairs
Format: Seminar 2 hours
Prerequisite: A class in international politics, Canadian politics, or Canadian history in the 20th century, or with the permission of the instructor. Restricted to students in their third or fourth years.
Enrolment: Limited to 20

POL 3571R Strategy and Canadian Defence Policy: This seminar examines post-World War II Canadian defence policy in three parts: 1. An analysis of important cases of policy development. 2. An investigation of certain persistent themes and current issues (e.g., Canada-U.S. defence relations; defence funding; weapons procurement; the role of women in the forces; civil-military relations, etc.) 3. An assessment of the major determinants of policy and prescriptions for the future.

Instructor: D. Middlemiss
Format: Seminar 2 hours
Prerequisite: Class in international politics or instructor's permission
Enrolment: Limited to 25

***POL 3574A or B American Foreign Policy:** Why Americans make the kind of foreign policy they do and the decision process and relevant methodologies for examining decision strategy are examined. Students develop an ability to explain foreign policy decisions of the United States.

Instructor: G. Winham
Format: Seminar 2 hours
Prerequisite: Course in international politics, US politics or history, or instructor's consent
Enrolment: limited to 25
Exclusion: POL 3572R

POL 3575A or B Nuclear Weapons and Arms Control in World Politics: The seminar examines the technological, doctrinal, and political aspects of the nuclear weapons "problem" and the arms control "solution". It also assesses the fate of contemporary nuclear arms control efforts.

Instructor: D.W. Middlemiss
Format: Seminar 2 hours
Prerequisite: Class in international relations or defence policy, or with instructor's permission.

Enrolment: Limited to 25

POL 3581A or B Diplomacy and Negotiation:

This class examines the practice of diplomatic negotiation in international relations. Attention is directed towards historical development and change in diplomatic practice, and to the nature and role of negotiation in the contemporary international system. Various examples of diplomatic negotiations are studied, ranging from bilateral negotiations such as nuclear arms talks or the Canada-US Free Trade Agreement, to multilateral negotiations such as the UN Conference of the Law of the Sea or GATT negotiations. Students are expected to participate in a simulation exercise and to prepare a term paper on a selected case of international negotiation.

Instructor: G. Winham

Format: Seminar 2 hours

Prerequisite: class in international politics or instructor's consent

Enrolment: limited to 25

POL 3585A or B Politics of the Environment:

Environmental issues have become increasingly important on international agendas. In this class, political analysis of these questions is grounded in a global ecological perspective. The topics for discussion include acid rain and other problems in the relations between advanced industrialized countries; the role of international institutions and international law in promoting environmental conservation; the environmental dimension of international development; and the politics of the transnational environmental movement.

Instructor: R. Boardman

Format: Seminar 2 hours

Prerequisite: A class in international politics or foreign policy, or instructor's permission.

Enrolment: Limited to 25

POL 3590R The Politics of the Sea: The major issues involved in the Law of the Sea, the differing interests of different countries, the developing legal framework, and the political process of the on-going negotiations are covered.

Instructor: Staff

Format: Seminar 2 hours

Prerequisite: Preference is given to graduate students, although mature students from other relevant disciplines are welcome.

Enrolment: Limited to 25

POL 3596A or B Theories of War and Peace:

This class examines critically a broad range of theories of the causes, persistence, and termination of war.

Instructor: F. Harvey

Format: Seminar 2 hours

Prerequisite: Class in international politics or instructor's permission

Enrolment: Limited to 25

POL 4520R Theories of International Relations: A survey of the discipline of international relations. Topics include the role of theory, structure and operation of the international system, balance of power, international economics and problems of dependence, war and problems of international security, international organization and the nation-state.

Instructor: G. Winham

Format: Seminar 2 hours

Prerequisite: Limited to graduate students and 4th year Honours students with previous work in international relations, or with instructor's permission.

Enrolment: Limited to 15

POL 3601R Readings in Political Science: A full-year reading class, taught only by special arrangement between individual students and individual instructors.

Instructor: Staff

POL 3602A or B Readings in Political Science: A first-term reading class, taught only by special arrangement between individual students and individual instructors.

Instructor: Staff

POL 3603A or B Readings in Political Science: A second-term reading class, taught only by special arrangement between individual students and individual instructors.

Instructor: Staff

POL 4600R Honours Essay: Restricted to Honours students in their 4th year.

Instructor: Staff; Consult Professor B.L. Crowley, Honours Co-ordinator.

Psychology

Location: Life Sciences Centre
 Telephone: (902) 494-3417
 FAX: (902) 494-8585

Chairperson of Department
 R.E. Brown

Student Advisors

Advisors are listed below under "Degree Programmes". To be put in touch with an advisor, go to the Information Desk in the Psychology Department, or phone (902) 494-3417.

Honours Advisor

J.W. Clark (494-3434)

Professors

R.E. Brown, BSc (Victoria), MA, PhD (Dal)
 P.J. Dunham, BA (DePauw), MA, PhD (Missouri)
 J.C. Fentress, BA (Amherst), PhD (Cantab)
 W.K. Honig, BA (Swarthmore), PhD (Duke)
 R.M. Klein, BA (SUNY), MA, PhD (Oregon),
 Graduate Studies Coordinator
 V.M. LoLordo, AB (Brown), PhD (Penn)
 P. McGrath, BA, MA (Saskatchewan), PhD (Queen's)
 J.A. McNulty, MA, PhD (Tor)
 I.A. Meinertzhagen, BSc (Aberdeen), PhD (St. Andrews)
 D.E. Mitchell, BSc, MAppSc (Melb), PhD (Berkeley)
 S. Nakajima, BA (Chiba), MA (Wash), PhD (McG)
 H. Robertson, MSc (Western), PhD (Cantab),
 Major appointment in Pharmacology
 B. Rusak, BA (Tor), PhD (Berkeley)
 S.R. Shaw, BSc (Lond), PhD (St. Andrews)
 M.G. Yoon, BS (Seoul), PhD (Berkeley)

Associate Professors

J. Barresi, BSc (Brown), MA (S. Calif), PhD (Wisconsin)
 J.W. Clark, MA (McG), PhD (Queen's)
 J.F. Connolly, AB (Holy Cross), MA (Saskatchewan), PhD (London)
 R. Croll, BSc (Tufts), PhD (McG), Major appointment in Physiology/Biophysics
 B. Earhard, BA, MA, PhD (Tor)
 J. McGlone, BA, MA, PhD (Western)
 B.R. Moore, AB (Emory), PhD (Stan)
 C. Moore, BA, PhD (Cantab)
 M. Ozler, BA, MA, PhD (Tor)
 G. Pretty, BSc, MSc (Acadia), PhD (Western, Psych/SMU)
 K. Samba, BEd, MA (Tokyo), PhD (Rutgers),
 Major appointment in Anatomy

Assistant Professors

K. Davidson, BA (Queen's), MASc, PhD (Waterloo)
 G.A. Eskoe, BA, PhD (Berkeley)
 P. McMullen, MSc (Tor), PhD (Waterloo)
 M. Sullivan, MA, PhD (Concordia)

Honourary Adjunct Professors

J. Backman, MA, PhD (Carleton),
 Education/Prov. of NS
 C. Bliebury, BSc, PhD (Liverpool),
 Psych/Camp Hill
 S.E. Bryson, BA (Guelph), PhD (McG),
 Psych/York
 J.M. Byrne, MA, PhD (Kansas), Psych/iWK
 H. Chipuer, BA (Sask), MA (Tor), PhD (Penn State)
 A.J. Cohen, BA (McG), MA, PhD (Queen's)
 C. Ellsworth, MA, PhD (Queen's), Psych/iWK
 J. Flek, BSc, MA, PhD (Western),
 Psych/Camp Hill
 J. Howes, BA (Dal), MA, PhD (Western),
 Psych/Camp Hill
 M. Leiter, BA (Duke), MA, (Vanderbilt), PhD (Oregon), major appointment with Acadia University
 G.W. MacDonald, BA (St. FX), MA, PhD (Windsor), Psych/iWK
 C.C. Mate-Kole, BSc (Bruner), PhD (Leicester), Psych/Rehab Centre
 P. O'Neill, MSc, PhD (Yale), Psych/Acadia
 S. Pigott, BA (Western), PhD (McG),
 Psych/Rehab. Inst of Pittsburgh
 K.E. Renner, BS (Penn), MA, PhD (Northwestern)
 P. Ritvo, MA (Calif State), PhD, (Cal Sch Prof Psy),
 Psychology/Psychiatry/Camp Hill
 R.S. Rodger, MA (Edin), PhD (Queen's Belfast)
 M. Schwartz, BSc (McG), MA, PhD (Waterloo), Psych/VG
 D. Symons, BSc (MoM), MA, PhD (Western),
 Psych/Acadia
 T.M. Vallie, BSc (Dal), MA, PhD (Western),
 Psych/Camp Hill

Senior Instructors

R.S. Hoffman, BA (Colo C), MA (Dal)

Instructor

J. Leary, BSc (Dal), MSc (Mem), PhD (Adelalde)

Postdoctoral Fellows

H. Piggins, PhD (Ottawa)
 M. Tihova-Petrova, PhD (Moscow)
 S.-W. Ying, MSc (Tianjin Medical College)

Research Associates

A. Fröhlich, Diplom. Dr. rer. Nat. (Freie Universität Berlin) (MSVU)

Introduction

Psychology is an experimental science; its purpose is to discover the conditions which

control the activities of animals and people, to measure these conditions and the responses they produce, and to use this knowledge to invent ways of predicting behaviour and changing it. It is a subject for inventive but also scientifically rigorous people, better suited to those who want to find out for themselves than to those who want to be told what to believe.

Psychology at Dalhousie treats behaviour as a natural phenomenon, and in that sense shares much with the other life sciences. Today, for example, the boundary that historically has separated psychology from zoology, physiology, or even cellular biology has begun to blur. On the other hand, important ties are being made to such disciplines as anthropology and sociology. The student will find that the diverse subject matter includes three major levels of analysis: the organism, the organism's biological machinery, and the broader social-environmental context in which particular behaviour patterns are expressed. Meaningful integration of these diverse levels and forms of analysis is an intellectual challenge of major proportions. Similarly, the time perspectives of immediate causation, development, evolution, and function all contribute to the modern approach to behavioural science; each must be evaluated in relation to the others.

General Interest Classes

Non-majors are encouraged to enrol in Psychology 1000, 1010 or 1500 and all 2nd year classes except 2000 and 2500, which are restricted to major and honours students in Psychology. In all classes for which Psychology 1000, 1010 or 1500 is a prerequisite, a minimum grade of B-. In the 1000-level class, is required to be admitted to the upper-level Psychology class.

Laboratories

Several courses include a laboratory component, and there are two types of laboratories used. One type is a research laboratory in which students will conduct research, collect data and write reports on the results of the research. All major and honours students must take the second-year research laboratory course (Psychology 2000) and at least one third-year research laboratory course.

The second type of laboratory is a proficiency or skills laboratory, which usually involves additional work in computer exercises related to the lecture material and course readings.

Enrolment Limitations

Lecture classes are limited by room size and, in the case of introductory classes, by the number of sections offered. Additional size restrictions are imposed on laboratory classes because of equipment limitations and the much closer supervision required. Size limitations on second- and third-year laboratory classes are specified under the listings for those classes. Major and honours students are encouraged to take second-year prerequisites for at least two third-year laboratory classes. Laboratory classes fill rapidly, and not all laboratory classes are offered every year.

Degree Programmes

The department offers the 15- and 20-credit BA or BSc Major degrees, and the BA or BSc Honours degree. While these programmes are described below, a more detailed and up-to-date description is available from the Psychology Information Desk in a pamphlet titled "A Student's Guide to Psychology Classes".

NOTE: Students who major in Psychology cannot use cross-listed Neuroscience classes for their minor or as electives.

BA or BSc with Honours in Psychology

Students enrolled in the honours programme must take at least nine and no more than eleven full credits beyond the introductory level in their area of concentration. Requirements for the Honours Degree in Psychology are listed below.

It is recommended that students in this programme take 2000A and 2500B and as many classes from the core programme (see requirement 3 below) as possible in the second year. Honours students are advised to complete Psychology 3500 prior to the fourth year. 4000-level seminars may be taken in the third and fourth years. 2000- or 3000-level classes may be taken at any time provided that the student meets the necessary prerequisites.

Although there is considerable flexibility for the student, it is important to plan carefully (this is especially true for those considering graduate work in Psychology). If you would like to be admitted to the honours programme or if you need advice in planning your programme, see Dr. J.W. Clark. The Psychology Department also offers a BSc honours degree in Neuroscience, described elsewhere in this calendar.

Requirements:

1. A grade of B- or better in Psychology 1000 or Psychology 1010 or Psychology 1500

2. Psychology 2000A (with a grade of B or better) and Psychology 2500B
3. At least four more 2000-level classes (either full or half credits). Of those four, no more than two may be taken in a single year from any one of the following four groupings:
 - A *Introduction to Neuroscience (2071); *Cellular Neurobiology (2072); Drugs and Behaviour (2370); Hormones and Behaviour (2170); Human Neuropsychology (2270)
 - B *Social Psychology (2080); *Developmental Psychology (2090); Clinical Psychology (2120); Personality (2280)
 - C *Introduction to Cognitive Psychology (2130); *Perceptual Processes (2150); *Language and the Brain (2190)
 - D *Animal Behaviour (2160); *Learning (2140); Adaptive Behaviour (2480)

* These classes are prerequisites for 3000-level research laboratory classes. Major students must take at least two of those prerequisites in their second year, and those prerequisites must be selected from more than one of the groupings.
4. Psychology 3500
5. At least two full-credit classes at the 3000-level, one of which is a research laboratory class
6. Psychology 4500 (Honours Thesis)
7. At least one full credit of 4000-level seminars
8. At least one more full credit of Psychology at the 3000- or 4000-level

Combined Honours

It is possible for students to take an honours degree combining psychology with a related arts or science subject. In such a combined honours programme the student must take eleven full credits beyond the 1000-level in two areas of specialization, with not more than seven full credits in either area. The student in the combined honours programme normally writes a thesis (or the equivalent) in the elective major area in which the majority of classes are taken. Any student intending to take a combined honours degree should consult with the two respective departments to arrange programme details.

Major (15- or 20-Credit) BA or BSc

The required classes for students who intend to major in psychology are listed below. Although there is considerable freedom of choice, the prospective major should plan carefully and obtain advice from one of the student advisors. At the Psychology Information Desk the student can be put in touch with an advisor.

Requirements:

1. A grade of B- or better in Psychology 1000 or Psychology 1010 or Psychology 1500
2. Psychology 2000A
3. For the 15-credit major, at least an additional 3.5 credits in Psychology of which two or more must be from 3000-level classes
4. For the 20-credit major, at least an additional 5.5 credits in Psychology of which three or more must be from 3000- and 4000-level classes
5. No more than two 2000-level classes may be taken in a single year from any one of the following four groupings:
 - A *Introduction to Neuroscience (2071); *Cellular Neurobiology (2072); Drugs and Behaviour (2370); Hormones and Behaviour (2170); Human Neuropsychology (2270)
 - B *Social Psychology (2080); *Developmental Psychology (2090); Clinical Psychology (2120); Personality (2280)
 - C *Introduction to Cognitive Psychology (2130); *Perceptual Processes (2150); *Language and the Brain (2190)
 - D *Animal Behaviour (2160); *Learning (2140); Adaptive Behaviour (2480)

* These classes are prerequisites for 3000-level research laboratory classes. Honours students must take at least two of those prerequisites in their second year, and those prerequisites must be selected from more than one of the groupings.
6. At least one 3000-level research laboratory class

Other Programmes

A variety of other programmes is available in cooperation with other departments. These programmes are designed to meet the needs of students whose specific interests may lie in areas other than those covered by the major and honours programmes offered by the department. Interested students should contact Dr. R. Brown for further information.

Repeating Classes

Students may repeat a class in which they have earned a passing grade only with written permission from the department. Refer to Regulation 19.4 (page 95 of this calendar) for further information.

Classes Offered

Not all of the classes listed below are offered every year. Please consult the current timetable on registration to determine if a

class is offered. Classes marked A or B are half-credit classes, offered in one term only, not both.

PSY 1000R Introduction to Psychology: Students interested in the biological and social bases of behaviour in both humans and animals may complete the class with an understanding of how the senses work and of how, for instance, we learn to see; of the different kinds of memory, how they operate, and how they are affected by disorders of the brain; of the way in which hereditary and environmental factors interlock to produce these complex sequences of behaviour which distinguish one species from another; of the way in which children learn their native language; of how the form of an animal society can be predicted from a knowledge of a limited number of ecological facts.

Psychology 1000 meets three hours a week for lectures. The grade is based on a number of examinations given at intervals throughout the year.

Format: lecture 3 hours
Instructor: Staff

PSY 1010R Introduction to Psychology: The content of Psychology 1010 is similar to that of Psychology 1000 but the manner of teaching is different. In Psychology 1010 there are no lectures, and there is no fixed pace for mastering the material in the class. Students work at their own pace through a series of units based on the textbook. When they feel they have mastered the content of each unit, they write a quiz consisting of questions that they have seen in advance. They then review and discuss their quiz with a tutor. If the student's understanding of the material is adequate, he or she proceeds to the next unit. If the tutor judges the student's knowledge of the unit to be inadequate, he or she takes another quiz on the same material, and has to pass that before proceeding to the next unit. The grade for the class is based entirely on the number of units the student completes during the academic year.

Format: tutorials 3 hours
Instructor: W. Honig

PSY 1500R INTRODUCTION TO PSYCHOLOGY: The content of Psychology 1500 is similar to that of regular Psychology 1000 classes. The major difference is that there are in-class laboratories in Psychology 1500. The purpose of these labs is to familiarize students with the methods of studying behavioural processes in an objective way. Students will serve as subjects in classroom studies to discover how perception and memory can be studied in a scientific manner. It is expected that one laboratory project will be written up each term. The demands imposed on students in

Psychology 1500 will be comparable to that imposed in other introductory psychology classes.

Format: lecture 3 hours
Instructor: S. Nakajima

PSY 2000A Methods in Experimental Psychology: An introduction to the methodological tools research psychologists use to study behaviour. Emphasis is placed on experimental design and the legitimacy of inferences derived from experimental results. Lectures proceed from a discussion of the general problems of using the scientific method in studying behaviour to a more specific examination of the analytic procedures commonly employed to investigate human and animal behaviour. Students conduct and analyze in written reports a series of experiments in the laboratory that illustrate important concepts discussed in class. Students taking Psychology 2000A must attend the first lecture session. Due to enrolment limitations, this class will be limited to students majoring in Psychology or Neuroscience, unless space is available after the first class.

Format: lecture 2 hours, lab 2 hours
Instructor: P. Dunham and Staff

Prerequisite: A grade of B- or better in Psychology 1000 or 1010 or 1500

Enrolment: 200

PSY 2071A Introduction to Neuroscience: This class introduces a number of aspects of this field emphasizing analyses which are precise at the neuronal level. A general introduction is provided by the vertebrate visual system, concentrating upon the analysis of visual information in the mammalian visual cortex. This is followed by consideration of muscle spindles and other receptors of the motor nervous system; a brief treatment of the anatomy of the mammalian brain and a more detailed analysis of the cerebellum; the other major components of the motor pathways to the spinal cord; spinal reflexes and the integrative action of neurons.

Format: lecture 3 hours
Instructor: I.A. Meinertzhagen
Prerequisite: Psychology 1000 or 1010 or 1500, Biology 1000 or 2020, or consent of instructor

PSY 2072B Cellular Neurobiology: Building on the knowledge of holistic aspects of brain function gained in Psychology 2071A, this class explores the neuronal basis of activity in all nervous systems. Starting with an analysis of the structure of neurons, the function of nerve cells will be explored with respect to the ionic and molecular basis of resting potentials and of electrical activity in nerve cells; synaptic transmission; the release

and postsynaptic action of synaptic transmitters; aspects of the neurochemistry of synaptic transmitters and of drug action; and glial cells. Cellular phenomena relevant to neuronal dysfunction will be discussed.

Format: lecture 3 hours
Instructor: S.R. Shaw
Prerequisites: Psychology/Neuroscience 2071 or consent of instructor

PSY 2080A or B Social Psychology: Some major issues in social psychology are introduced through a critical analysis of theories and research in which the actions of individuals are seen as products of their social context. Both the lectures and the textbook are intended to promote a close and sceptical evaluation of our knowledge of our obedience and rebellion, our affections and hostilities, our willingness to help and injure, our attempts to explain ourselves and others, our erotic orientations and gender roles. Questions on such matters are given to the students to work on out of class and the examinations are composed of some of these questions.

Format: lecture 3 hours
Instructor: J.W. Clark
Prerequisite: Psychology 1000 or 1010 or 1500

PSY 2090A or B Developmental Psychology: People change with age. This class examines the changes that occur in humans from conception through adolescence. Biological, social, cognitive, and linguistic aspects of development are considered. Theory, research, and practical implications are integrated throughout the class.

Format: lecture 3 hours
Instructor: C. Moore
Prerequisite: Psychology 1000 or 1010 or 1500

PSY 2120A or B Clinical Psychology: An introduction to the use of psychological principles to define, assess and treat abnormal human behaviour. Topics covered include: the nature and history of clinical psychology; training in clinical psychology; research methods; psychological functions and dysfunctions; assessment methods; and intervention techniques. The functions of clinical psychologists in various settings such as general hospitals, mental health clinics, industry and the justice system are presented. Attention is given to issues of diagnosis from both psychiatric and psychological perspectives. Assessment of personality as well as intellectual and neuropsychological functioning is discussed. Intervention techniques such as behavioural and cognitive therapies are examined. The emphasis of the course is on the experimental psychology foundations upon which clinical psychology rests;

experimentally verified assessment and intervention procedures are given particular attention. Different theoretical orientations to abnormal behaviour (e.g. the medical model and the behavioural/psychological model) are examined.

Format: lecture 3 hours
Instructor: M. Sullivan
Prerequisites: Psychology 1000 or 1010 or 1500

Restriction: This class may not be taken concurrently with Psychology 3121 or 3129

PSY 2130A or B Introduction to Cognitive Psychology: Lectures focus on the processes involved in transforming sensory information into the meaningful, coherent world of everyday experience we know. Initially, emphasis is on the visual system, and how information within that system is structured and organized, followed by a consideration of the character of the internal representations used in thinking and remembering.

Format: lecture 3 hours
Instructor: B. Earhard
Prerequisites: Psychology 1000 or 1010 or 1500

PSY 2140A or B Learning: Trace the experimental study of learning from the turn-of-the-century research of Pavlov and Thorndike to the present. Development of the field of animal learning is described in terms of the ways in which particular conceptions of the learning process have guided experimentation, and have in turn been revised on the basis of the outcomes of that experimentation. Some important concepts discussed are: association, attention, biological constraints on learning, classical conditioning, discrimination, expectancies, law of effect, learning-performance distinction, operant conditioning, S-S and S-R bonds, and stimulus control. The value of various approaches is discussed with respect to several goals: (1) providing general principles of learning; (2) understanding the behaviour of particular species; (3) direct application to human problems. Emphasis is on understanding why researchers in animal learning do what they are currently doing (given the goals and the historical context), rather than on learning a number of facts about animal learning.

Format: lecture 3 hours
Instructor: V. LoLordo
Prerequisite: Psychology 1000 or 1010 or 1500

PSY 2150A or B Perceptual Processes: Perception deals with the way in which our senses provide us with information about our environment. This class focuses on the process by which sensory experiences are

coded, how they are interpreted by the nervous system, and how experience modifies perception.

Format: lecture 3 hours
Instructor: J. McNulty
Prerequisites: Psychology 1000 or 1010 or 1500 or Biology 1000

PSY 2160A or B Animal Behaviour: An examination of the natural and, to a lesser extent, the laboratory behaviour of several intensively-studied groups of animals. Foraging and communication, predation and defense, sex and aggression, homing and migration are studied as they occur in such organisms as bees and ants, moths, bats, various birds, and chimpanzees.

Format: lecture 3 hours
Instructor: B.R. Moore
Prerequisites: Psychology 1000 or 1010 or 1500 or Biology 1000

PSY 2170A or B Hormones and Behaviour: An introduction to the endocrinological bases of mammalian social behaviour. Emphasis is on the mechanisms by which the hormones of the hypothalamus, pituitary gland, gonads and adrenal gland control sexual, aggressive and maternal behaviour. Other topics covered are: hormone receptors in the brain; the menstrual cycle and human reproduction; puberty; sex differences in the brain; the pineal gland; neuro-transmitters; pheromones; crowding and social stress.

Format: lecture 3 hours
Instructor: R.E. Brown
Prerequisites: Psychology 1000 or 1010 or 1500 or Biology 1000.

PSY 2190A or B Language and the Brain: An introduction to the processes in the use of language by human beings. The main topics are: 1) the structure of the language; 2) the function of language; 3) the process of comprehension; 4) the process of production; 5) acquisition of language; and 6) language disorders and brain damages.

Format: lecture 3 hours
Instructor: M. Yoon
Prerequisites: Psychology 1000 or 1010 or 1500

PSY 2270A or B Human Neuropsychology: This class explores not only normal but also abnormal brain function, as revealed by the consequences of trauma, disease, and surgical intervention. Aphasia, epilepsy, the role of brain chemicals in behaviour, cerebral asymmetry, and localization of brain function are examples of the topics covered.

Format: lecture 3 hours
Instructor: M. Ozier
Prerequisites: Psychology 1000 or 1010 or 1500

PSY 2280A or B Personality: In this class a person is treated as a unified whole.

Personality deals with questions such as: Is a science of persons possible? What forms can it take? Are there types of personalities, or is each individual's personality unique? Is an individual's life history an expression of his or her personality, or is personality description merely a summary statement of behaviour whose cause lies elsewhere?

Format: lecture 3 hours
Instructor: J. Barree
Prerequisites: Psychology 1000 or 1010 or 1500

PSY 2370A or B Drugs and Behaviour: An introduction to behavioural psychopharmacology. The lectures involve basic anatomy, physiology, and chemistry of the nervous system. Behavioural effects and underlying mechanisms of various psychoactive drugs will be discussed. Specific topics will cover alcohol, tobacco, amphetamines, cocaine, opiates, hallucinogens, tranquillizers, and antipsychotic drugs.

Format: lecture 3 hours
Instructor: S. Nakajima
Prerequisites: Psychology 1000 or 1010 or 1500

PSY 2460A or B Adaptive Behaviour: Adaptation between organisms and their environments is a common theme that can be used to link research in the behavioural and biological sciences. In this course three basic issues are addressed: (1) How do we evaluate the balance among internal and external events that define adaptive behaviour? (2) How do we separate individual properties of adaptive control systems while also determining rules by which these properties fit together? (3) How do genetic substrates and developmental events combine to set the boundaries of adaptive performance? Answers to these questions rest upon the dual tendencies for adaptive systems to be both interactive and self-organized. Underlying issues here are examined with current data from behavioural and biological disciplines, in which different specific adaptations, different levels of organization and different time frames of operation are compared.

Format: lecture 3 hours
Instructor: J. Fentress
Prerequisites: Psychology 1000 or 1010 or 1500 or Biology 1000

PSY 2500B Contemporary Research Problems in Psychology: As a continuation of Psychology 2000A, this class introduces prospective honours students to the design, execution and analysis of independent research. Each student works with a supervisor on a one to one basis preparing a research project which the student then conducts. The lecture periods are devoted to

an introduction to the design and statistical analysis of experiments. In the lab meetings, the student will give oral reports on the proposed research. At the end of the course formal oral reports will be given in an all-day conference for the entire class. A formal written report on the research is submitted at the end of the term.

Format: lecture 2 hours, lab 2 hours
Instructors: R. Hoffman
Prerequisite: 2000A, with grade of B or better and permission of the instructor

PSY 3000R Independent Research in Modern Psychology: Primarily for students wishing further experience and understanding of psychological research. A student in the class chooses a member of staff who serves as an adviser throughout the academic year, and under whose supervision independent research is conducted.

Format: lab 4 hours
Instructor: Staff
Prerequisites: Psychology 2000A and previous or concurrent enrolment in two other 3000-level classes; and the prior consent of the instructor

PSY 3010R Advanced General Psychology:

For the advanced student, a review of general psychology with the aim of consolidating the student's knowledge. The method is unconventional. With the assistance of the instructor, the student prepares the material assigned to Psychology 1010 at a level which enables him or her to instruct introductory students in individual tutorials. Ideally, prospective students should consult with Dr. W. Honig in the spring of the preceding year.

Format: lecture 2 hours, tutorials 3 hours
Instructor: W. Honig
Prerequisites: Psychology 200, advanced classes in psychology and permission of the instructor

PSY 3040R Learning and Motivation: An examination in detail of selected topics within the field of learning and conditioning. The emphasis is on identification and clarification of fundamental processes, their boundaries, biological significance and evolutionary history.

Format: lecture 3 hours, research lab 2 hours
Instructor: B.R. Moore
Prerequisite: Psychology 2000A and 2140
Enrolment: 25

PSY 3050R Perception: This class considers the way in which information about the world is provided by the senses and how we use this information in our behaviour. The material falls into four sections. (1) The

methodological and theoretical problems peculiar to the study of sensation and perception; (2) The transformation of physical stimulus energy into neural energy; (3) The physiological and psychophysical analysis of the sensory systems with particular emphasis on vision; and (4) The development of perception and its relation to the anatomical and physiological development of the sensory pathways. The experimental work has been selected for its importance in the theoretical understanding of perceptual processes and consists of a general introduction to the apparatus and methods used in perceptual research.

Format: lecture 3 hours, research lab 2 hours
Instructor: D.E. Mitchell
Prerequisite: Psychology 2000A and 2150
Enrolment: 40

PSY 3070R Physiological Psychology:

Physiological psychology is concerned with the biological explanation of psychological phenomena. Students should have a working knowledge of concepts and methods in experimental psychology. Emphasis is on psychological issues with the answers sought in physiological terms.

Format: lecture 2 hours, research lab 3 hours
Instructor: S. Nakajima
Prerequisite: Psychology 2000A and permission of the instructor
Enrolment: 9

PSY 3071R Physiological Psychology:

Students in this class attend the same lectures as students in Psychology 3070R, but submit term papers rather than participate in laboratory work. The class is designed for students who wish to learn about physiological aspects of psychological issues, but who do not require the laboratory experience. Thus, the class does not meet the departmental laboratory requirement.

Format: lecture 2 hours, conference 1 hour
Instructor: S. Nakajima
Prerequisite: Psychology 2000A

PSY 3080R Experimental Social Psychology:

This class involves the study of individual behaviour as a function of social stimuli with emphasis on extensive student research projects and class presentations. The class develops from discussion of research designs and methods to the study of basic processes such as person perception, social comparison, and social influence, including behaviour within groups and the relations between groups.

Format: lecture 3 hours, research lab 1 hour
Instructor: J. Barree
Prerequisite: Psychology 2000A and 2080

Enrolment: 80

PSY 3091A or B Methods in Developmental Psychology: Students learn how to conduct research on changes in behaviour from infancy through to senior years. They carry out projects representing different methodologies including a longitudinal observational study of an infant over the duration of the school term, two class experiments that focus on perceptual, cognitive or social development of different age levels, and a final independent project designed by the student. Class time is divided among lecture, demonstration, class laboratory work, group discussion, and oral presentation.

Format: lecture 1 hour, research lab 2 hours

Instructor: Staff

Prerequisite: Psychology 2000A and 2090

Enrolment: 40

PSY 3092A or B Early Development: This class examines development in infancy and the preschool period. The main theme of the class is to show how perceptual, cognitive, emotional, social, and linguistic changes occurring during the first five years of life are integrated in the psychological life of the child to allow the development of social understanding.

Format: lecture 3 hours

Instructor: C. Moore

Prerequisites: Psychology 2000 and 2090

PSY 3121A or B Adult Psychopathology: This class is concerned with the disorders of psychological functioning seen in adults. A wide range of disorders will be touched upon. Particular attention is given to disorders as they highlight current theory and controversy. Schizophrenia, mood disorders, anxiety disorders, organic syndromes and dementia are examined with regard to both biological and psychological mechanisms. Assessment and research techniques are discussed with emphasis on recent advances in brain imaging techniques.

Format: lecture 3 hours

Instructor: J.F. Connolly

Prerequisite: Psychology 2000 and 2120

PSY 3129A or B Childhood Psychopathology: This class examines a wide range of behaviour disorders in children (e.g., reading disability, autism, attention deficit disorder). The goal is to gain a better understanding of the nature of these disorders by exploring empirical findings from both the social and physical sciences. Discussion will focus on problems of definition, and the relative merits of different theoretical accounts. Data on therapeutic outcome and ethical issues regarding intervention will also be considered.

Format: lecture 3 hours, proficiency lab

Instructor: P. McGrath

Prerequisite: Psychology 2000 and 2120

PSY 3130R Cognitive Psychology: Cognitive psychology deals with how we gain information about the world, how such information is represented and transformed as knowledge, how it is stored and how that knowledge is used to direct our attention and behaviour. It involves the processes of perception, memory, attention and thinking. This class focuses not only on what is known about human cognition, but also on techniques cognitive scientists have developed to discover this knowledge.

Format: lecture 2 hours, research lab 2 hours

Instructor: R. Klein

Prerequisites: Psychology 2000A, and either 2130, 2150, 2270 or consent of instructor

Enrolment: 40

PSY 3150A or B Introduction to Hearing and Speech Mechanisms: Hearing and speech are two behavioural capacities of fundamental importance to normal human communication. This lecture class is designed to provide a basic understanding of the peripheral and central neural mechanisms of hearing, and of some psychological and physiological processes involved in speech production and speech perception. The class is intended for those students anticipating more advanced training in neural mechanisms of hearing, speech science, human communication disorders and/or audiology. The class emphasizes normal hearing and speech mechanisms, but will address pathology where evidence from pathological subjects is pertinent to understanding normal function.

Class content: Introductory acoustics; structure and function of the outer and middle ear; structure and function of the cochlea; hair cell physiology and sensory transduction; coding of simple and complex sounds in the auditory nerve; sound localization mechanisms as an example of the correspondence between the physical properties of the stimulus, neural sensitivity and behavioural performance; theories of speech production; theories of speech perception; acoustic and linguistic contributions to speech perception.

Format: lecture 3 hours

Instructor: D. Phillips

Prerequisites: Psychology 2000, 2150 or 3050, or permission of instructor; Psychology 2071A strongly recommended

PSY 3160R Ethology: Ethology is the biological study of behaviour. It uses psychology, genetics, physiology, ecology and evolutionary theory to solve problems in the development, function and causation of behaviour across all animal species. These

diverse approaches to the study of animal behaviour are presented in naturalistic and experimental situations. In laboratory exercises qualitative and quantitative records of behaviour are made in the field and in the laboratory. There are several group research projects (first term) and an individual research project (second term).

Format: lecture 2 hours, research lab 2 hours

Instructor: J. Fentress

Prerequisites: Psychology 2000 and 2160, or Biology 1000 and permission of the instructor

Enrolment: 40

PSY 3197A or B Human Communication: An introduction to the cognitive and social processes of communication among human beings by the use of language or other symbols as abstract mental tools. The main topics are: 1) the nature of linguistic signs; 2) mental representation; 3) deixis; 4) implicature; 5) presupposition; 6) speech acts; and 7) structure of conversation.

Format: lecture 3 hours

Instructor: M. Yoon

Prerequisites: Psychology 2000A and 2190 or 2130

PSY 3260A or B Biological Rhythms: The temporal structure of animal and human physiology is governed by both homeostatic mechanisms and by a system of biological clocks. These internal clocks generate rhythms with various periods in virtually every physiological and behavioural system. Daily (circadian) clocks are the most prominent; they generate rhythms in sleep, reproduction, intellectual performance and many other functions. This class examines the nature of these biological clocks and their physiological substrates, with an emphasis on the neural mechanisms involved in rhythm generation and synchronization in a variety of species. It also explores the hypothesized role of circadian mechanisms in sleep disorders, jet lag and depression.

Format: lecture 3 hours

Instructor: B. Rueck

Prerequisites: Psychology 2000, or Biology 1000

PSY 3270A or B Developmental Neuroscience: This class introduces students who are already familiar with the structural organization and functional properties of the mature nervous system to aspects of neural development, especially at the cellular level. The first part of the class will link the early events of neural development to general embryonic development. Cell determination, pattern regulation, cell production, cell-lineage analysis, and neuronal differentiation, movement and migration will be discussed. Special attention will then be

given to later developmental events such as neuronal growth cones, cell death, growth factors, neuron-neuron interactions and synapse formation using invertebrate and vertebrate examples.

Format: lecture 3 hours

Instructor: M. Yoon

Prerequisites: Psychology 2000 and Psychology/Neuroscience 2071A and 2072B

PSY 3370A or B Neuroscience Laboratory I: (same as Neuroscience 3370) The two classes 3370 and 3371 (see next entry) are coordinated and provide introduction to several techniques used in contemporary neuroscience. The following information applies to these classes as a pair, within which the exact distribution of experimental approaches may vary from year to year according to availability of equipment and material, and numbers enrolled. Usually, electrical recording methods from several types of preparation are emphasized in 3370, while detailed neuroanatomically-based approaches are favoured in 3371. Regularly scheduled labs with students working in groups of 2 or 3 under supervision are supplemented by occasional lectures, in both classes. Students become familiar with electrical recording and stimulation methods and related techniques, currently using both sensory and motor system preparations. Neuroanatomical analysis is introduced by way of techniques usually selected from the following: Golgi impregnation of neurones, immunocytochemistry, dye-tracing of connections, and electronmicroscopy of the visual system or central nervous system. Lab II (3371) usually runs in the second term for selected, advanced students, building upon foundations laid in 3370 but using different practical approaches.

Format: lab 3 hours

Instructor: S.R. Shaw

Prerequisites: Psychology 2000 and Psychology/Neuroscience 2071A and 2072B, or 3270A, and instructor's consent

Enrolment: 12

PSY 3371A or B Neuroscience Laboratory II: (same as Neuroscience 3371) For a description of this neuroscience lab class, see the entry under 3370 above; usually, 3371 is coordinated closely with 3370.

Format: lab 3 hours

Instructor: I.A. Mainerzhagen

Prerequisites: Psychology/Neuroscience 3370 and consent of instructor

Enrolment: 12

PSY 3390A or B Cognitive Development: In this class we trace the development of the child's knowledge from birth to adolescence. Piaget's theory provides the background for

the study of recent progress in our understanding of children's concepts of the physical world.

Format: lecture 3 hours

Instructor: Staff

Prerequisite: Psychology 2000A and 2090 or consent of instructor

PSY 3500R Statistical Methods in

Psychology: This class is primarily intended for honours students, but other students may be admitted with the consent of the instructor. This class is designed to enable students to understand parametric and nonparametric statistical procedures and their descriptive and inferential application to behavioural research. In addition, students learn to execute computer programmes for data organization and analysis. Class work includes lecture, seminar, and statistical/computer assignments.

Format: lecture 2 hours, skills lab 2 hours

Instructor: J. McNulty

Prerequisite: Psychology 2000A and 2500B

PSY 3520R History of Psychology: In writings dating from antiquity to the early years of the 20th century, we explore the understanding of such abiding sources of our curiosity as individual, racial and sexual differences, the distinctions between man and animal, the sources of odd actions, the nature of the brain and of vision.

Format: seminar 3 hours

Instructor: J.W. Clark

Prerequisite: Psychology 2000A or consent of the instructor

PSY 3590A or B Perceptual Development:

This class examines the development of visual and auditory capacities in human infants and in a variety of animal species with sensory systems like our own. The neural events that underlie these developmental changes in the various sensory pathways will be discussed. The class will also grapple with the old question of how early sensory experience influences our perceptual abilities.

Format: lecture 3 hours

Instructor: D. Mitchell

Prerequisite: Psychology 2000A

PSY 3760A or B Neuroethology:

Neuroethology is the study of the neural bases of animal behaviour. The class will emphasize cellular approaches toward understanding the integrative mechanisms of the nervous system which underlie complex behaviours. Feature detectors, command systems and motor programme generators will be examined in depth using examples from vertebrate preparations. Cellular bases of higher order functions such as motivation, learning and choice will be explored if time permits.

Format: lecture 3 hours

Instructor: Staff

Prerequisites: Psychology 2000A and Psychology 2160 or 2071 or Biology 2020 or consent of the instructor

4000-Level Seminars

These seminars (4000-4440) are intended for 3rd and 4th year honours students. Third-year students are eligible provided they obtain permission from the instructor, and the needs of all the fourth-year honours students are met. The topics covered in these classes vary from year to year. Consult the department for the specific course descriptions.

PSY 4000A or B Senior Seminar:

Format: 2 hours

Instructor: Staff

PSY 4001A or B Contemporary Issues in Psychology:

Format: 2 hours

Instructor: Staff

PSY 4040A or B Learning Applications in Clinical and Social Psychology:

Format: 2 hours

Instructor: Staff

PSY 4050A or B Topics in Perception: Same as Neuroscience 4050

Format: 2 hours

Instructor: Staff

PSY 4070A or B Neuroscience Seminar: Same as Neuroscience 4070

Format: 2 hours

Instructor: Staff

Prerequisites: Psychology 2071, 2072 or 3270, or consent of the instructor

PSY 4080A or B Topics in Social Psychology and Personality:

Format: 2 hours

Instructor: Staff

PSY 4090A or B Development of Social Behaviour:

Format: 2 hours

Instructor: Staff

PSY 4120A or B Topics in Clinical Psychology:

Format: 2 hours

Instructor: Staff

PSY 4130A or B Topics in Human Information Processing:

Format: 2 hours

Instructor: Staff

PSY 4140A or B Animal Learning Topics:

Format: 2 hours

Instructor: Staff

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PSY 4160A or B Topics in Behavioural

Biology: Same as Neuroscience 4160

Format: 2 hours

Instructor: Staff

PSY 4230A or B Human Performance Topics:

Format: 2 hours

Instructor: Staff

PSY 4440A or B Topics in Infant

Development:

Format: 2 hours

Instructor: Staff

PSY 4500R Honours Thesis: The purpose is

to acquaint the student with a current experimental problem and the related research procedures in experimental psychology. Each student works with a staff member who advises the student about research in the area of interest, and closely supervises an original research project carried out by the student. The students meet together occasionally throughout the year to describe their proposed research and their progress. Each student must submit a formal written report of the completed research in APA style. The final grade is based upon the originality and skill displayed in executing the project, with emphasis upon the submitted report and an oral presentation.

Instructor: J.W. Clark and Staff

Prerequisites: Restricted to honours students in their graduating year

School of Public Administration

Location: 1229 Le Marchant Street,
Halifax, N.S. B3R 1B4
Tel: (902) 494-3742
Fax: (902) 494-7023

Introduction

The School of Public Administration prepares students for careers in government agencies, public corporations, social service agencies, and para-public organizations. It imparts a knowledge of the substance and processes of public policy and of the machinery of government. It provides an appreciation of, and training in, the techniques of political and economic analysis and evaluation. It develops a capacity for financial and personnel management. It fosters professional attitudes appropriate to public service.

The School's aim in each respect is to promote effective, efficient and accountable management - management of government and management in government. Public managers today must grapple with both new and traditional problems. The public demands economy, effectiveness, efficiency and accountability from the public service. To meet these demands, public managers require an appreciation of, and broad professional training in, the most up-to-date, administrative practices and methods.

These needs are addressed through two graduate programmes - the MPA and the DPA - and the undergraduate Certificate in Public Administration. All three programmes are interdisciplinary in nature and are built around the principle that, though administration is a general, or generic, process, the environment of the public sector is so distinct that public administration should be treated as a field worthy of study in its own right.

Administrative Staff 1992/93

Director of the School

D.H. Poel, BA (Calvin), MA (W Mich), PhD (Iowa)

Undergraduate Coordinator

D.H. Poel, BA (Calvin), MA (W Mich), PhD (Iowa)

Academic Staff 1992/93

Professors

Peter Aucoin, BA (SMU), MA (Dal), PhD (Queen's)

Herman Bakvis, BA (Queen's), MA, PhD (UBC)

M.P. Brown, BA (Mt.A), MA (DAL), PhD (Tor)

J.D. McNiven, MA, PhD (Mich.), (Dean, Faculty of Management)

A.P. Pross, BA, MA (Queen's), PhD (Tor)

Associate Professors

D.H. Poel (Director & Undergraduate Co-ordinator), BA, (Calvin), MA (W Mich), PhD (Iowa)

F.K. Siddiq (Associate Director & Graduate Co-ordinator), BA, MA (Dhaka), PhD (Dal)

Assistant Professors

Marguerite Caseln, BA (Man), MA (UBC), PhD (Tor)

Special Lecturers

Chris Almon, BSc (Dal), MEd (Slippery Rock), MPA (Dal)

Saleh Amirkhalkhali, BA (Shiraz, Iran), MA, PhD (Dal) (at Saint Mary's University)

Kalreen Chaytor, PhD, MA (Dal), BA (MSVU)

Margot Knox, MSo (Dal), MBA (SMU), BEd (Dal), BSo (Queen's Belfast)

Jack Novaok, MPA, BComm (Dal)

Allen O'Brien, BSc, LLD (Dal)

Terry Vey, CMA

The Certificate in Public Administration (CPA Programme)

The CPA is intended primarily for public servants who do not have an undergraduate degree. The programme consists of undergraduate classes designed to provide a general introduction to the structure and organization of government and the principles of public administration.

Students accepted into the CPA Programme take the following classes:

Political Science 2200R

COMM 1101A, 1102B or POLS 2494R

COMM 2301A

COMM 3302B

PADM 2249A

PADM 2250B

(POLS 2200R, 2494R, COMM 1101A/B, 2301A/B are described elsewhere in the calendar.)

They also take an elective credit class selected from those offered intramurally and approved by the School.

Classes Offered

PADM 2249A Organization Theory for Public Administration: This course introduces students to the study and practice of public administration by way of an examination of the structure, design and behaviour of the complex organizational systems through and within which public administration is practised. It outlines the principal theoretical issues inherent in public administration insofar as the administration of public affairs relates to the ways in which governments are organized, and organize themselves, to perform their multiple and varied functions. The course focuses on public administration but it also draws upon literature that encompasses both private and public administration with relevant comparisons and differences considered where appropriate. In so doing, it acknowledges not only the degree to which organizational theories themselves are generic to all forms of administration but also the phenomena of non-profit organizations in the private sector and commercial enterprises in the public sector. The example, illustrations and cases used for the consideration of actual organization structure, design and behaviour are drawn primarily from the Canadian experience of public administration at all three levels of government.

Instructor: TBA
Format: seminar 2 hours
Enrolment: 25

PADM 2250B Management in the Public Sector: This class is designed for undergraduate students in Public Administration, Commerce, Political Science and the Health Professions who require an introduction to the principles and methods used in the operation of government organizations. The class introduces the student to the management of Canadian government organizations at the federal, provincial and municipal levels. Students are shown how managers in departments work within a framework of government-wide policies of personnel and financial management. In order to understand those policies the class reviews the recent development of public sector management in Canada and then looks in detail at the processes of personnel and financial management.

Instructor: TBA
Format: seminar 2 hours
Enrolment: 25

Application Procedure

Application forms are available from the Office of the Registrar of Dalhousie University. Applications should be submitted as early as

possible, and not later than July 1 in the academic year in which studies are to commence.

Further information on the Certificate or other programmes of the School of Public Administration may be obtained from: Administrative Secretary, School of Public Administration, Dalhousie University, Halifax, Nova Scotia, B3H 3J5, (902) 494-3742.

Part-time Study

Students may complete the Certificate through part-time study at the rate of not more than two credits during the academic year. One further credit can be taken in each summer session.

Credits

Normally, four of the five credits in the programme must be taken at Dalhousie University and at least three of the five credits after the student has registered in the programme.

Classes taken for the Certificate may be credited toward a Bachelor's degree, but a student must complete at least five of the subjects required for the degree after the awarding of the Certificate.

The Special Certificate Programme

The Special Certificate programme is a course of studies which give students who do not satisfy the general requirements for admission to the Faculty of Graduate Studies an opportunity to qualify for admission to the DPA and MPA degrees. Individuals with a minimum of 10 years work experience in an administrative position who have (1) completed a full year of university study and (2) achieved a professional designation (e.g., the Certificate in Municipal Administration from Henson College) can be considered.

Successful completion of the Certificate, with an average grade of B+ and with no grade below B-, may constitute a basis for a recommendation from the School for admission to the Faculty of Graduate Studies.

Individuals interested in enrolling in the Special Certificate Programme should consult the School before filing applications and should include with their applications a resume and a statement of their reasons for wishing to undertake the programme.

Recreation, Physical & Health Education

Location: 6230 South Street, Halifax,
N.S. B3H 3J5
Telephone: (902) 494-2152
FAX: (902) 494-5120

Academic Staff

Director and Professor

A.J. Young, BS (West Chester State Col.),
MS, PhD (Maryland)

Professors

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E.G. Belzer Jr., BS (West Chester State Col),
MS (Maryland), PhD (Illinois)
L.E. Holt, BS, MS (Springfield Col.), PhD
(Southern Illinois)
B. Keady, BSoN (MSVU), MA, PhD (Dal), RN
A. Richards, Dip. PE (Carnegie School of Phys
Ed, England), Teach. Cert. (Trent Park Col),
MSc (Dal), EdD (Colorado)
A.J. Young, BS (West Chester State Col),
MS, PhD (Maryland) Director and Professor

Associate Professors

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R.L. Kirby, MD (Dal), FRCP(C), major
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E. Lambie, BSo(Home Ec) (Acadia),
MPH(Nutrition) (Mich), PdT
R.F. Lyons, BA (Dal), MEd (St. FX), PhD
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C.A. Savoy, BPE (UNB), EdM (Boston)
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L.J. Verabloff, BA BPHE (Queen's), MS
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Assistant Professors

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S.L. Curwin, DipPT, BSo, MSc (Dal), PhD
(UCLA), major appointment in the School of
Physiotherapy
C.D. Hood, BPE (Calgary), MS, PhD (Illinois)
N.M. Ipson, BA, MS, PhD (Brigham Young)
L.A. MacGregor, BPE (Dal), MS (Illinois),
Coordinator of the Field Experience
Programme in Physical Education
C.R. Mangham, BEd, MA (UBC), PhD (Oregon)
D.P. McGuire, BA (Wright State), MA
(Cincinnati), Head of the Health Education
Division
J.A. Scott, BPE (Calgary), MS (Oregon),
Co-ordinator of the Activity Programme in
Physical Education
A.D. Yarr, BPE, MPE (UBC)

Special Lecturers

J.F. MacDougall, BA, BEd (St. FX), Dip.
Physical and Health Education (Dal), MEd
(Ontario Inst. for Studies in Eduo.)
H.A. Noble, BSo (Springfield Col), AIE
(London), DPE (Acadia), LLD (Dal)
R.E. Stalker, MD (Dal)

Purposes of the School

The School of Recreation, Physical and
Health Education assumes the responsibilities
for undergraduate studies in the Divisions of
Health Education, Physical Education and
Kinesiology and Leisure Studies, and for the
conduct of graduate education and research.

Information about the graduate
programmes available in Kinesiology, Health
Education and Leisure Studies is available in
the Calendar of the Faculty of Graduate
Studies.

School of Recreation, Health, & Physical Education Regulations

1. All students must observe the University
and Academic Regulations described in this
Calendar.
2. All students must attend the classes of
their prescribed course regularly and
punctually. When the work of a student
becomes unsatisfactory or attendance is
irregular, the student may be required to
discontinue the class concerned.

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3. Grade Point Average Requirements

The grade point average system is described in the Academic Regulations. School regulations relating to GPA apply to students whose initial registration in the School was in the Fall of 1990 or earlier (consult the calendar of the appropriate year).

4. Students expecting to receive a BSc (Kinesiology) degree with honours are required to maintain a GPA of 3.0 or better over the last 3 years and all grades counting toward an honours degree must be C or better.

5. Academic Appeals Procedures

5.1 Appeals to Division Committee on Studies:

In each of the divisions in the School of Recreation, Physical and Health Education (Health Education, Physical Education and Kinesiology, Leisure Studies) a Committee on Studies exists for the purpose of hearing initial student appeals of academic decisions.

The student appellant is responsible for the preparation of all documentation in support of his/her appeal.

The student must submit the appeal to the appropriate division head who will convene a meeting of the Committee on Studies.

The student has the right to appear before the Committee on Studies and he/she should notify the division head of his/her desire to do so. The student also has the right to be represented by an advocate of his/her choice.

The decision of the divisional Committee on Studies shall be conveyed to the student, in writing, by the division head immediately after the conclusion of the appeal. This notification should include information about procedures to appeal to the School's Committee on Studies.

If the student's appeal is denied, the student may appeal to the School's Committee on Studies by the procedures identified below. This appeal must be presented to the School's Director within 30 days of notification from the division head of the result of the appeal at the division level.

If the student's appeal is upheld, two things may happen:

In the case of division regulations, the matter need go no further and implementation is carried out by the division head.

In the case of the School/Faculty regulations, the division head is responsible for presenting the case to the Committee on Studies of the School of Recreation, Physical and Health Education.

5.2 Appeals to the Committee on Studies of the School of Recreation, Physical and Health Education:

As noted above it is the responsibility of the student to forward the necessary documentation to the School's Committee on Studies when the appeal is initiated by the student. Otherwise, it is the responsibility of the division head.

As Chair of the School's Committee on Studies, the Director will inform the student of his/her right to appear before the Committee. The student will also be informed of his/her right to be represented by an advocate of his/her choice. The decision of the School's Committee on Studies shall be conveyed in writing to the student by the Director immediately after the conclusion of the appeal. If the student's appeal is denied this notification shall include information about procedures to appeal to the Committee on Studies of the Faculty of Health Professions (see Academic Regulation 28.2). It should be noted that this appeal to the Faculty of Health Professions Committee on Studies must be presented within 30 days of notification from the School of the disputed academic decision.

If the student's appeal is supported, two things may happen: In the case of School regulations, the matter need go no further and implementation is carried out by the Director of the School.

In the case of Faculty of Health Professions regulations, the Director of the School is responsible for presenting the case to the Committee on Studies of the Faculty of Health Professions.

6. Student Advisory Programmes

Although many classes are compulsory in the School's programme, considerable latitude exists for the development and extension of individual interests. To help in planning a total personal programme each student is assigned an adviser from the teaching staff. Advisers can help students to select classes, avoid common pitfalls, choose activities, interpret regulations and solve various types of problems. Although students are responsible for their own programmes and for maintaining high academic standards, they should consult their advisor regularly and whenever problems may occur.

7. Student Exchange Programme

A reciprocal exchange programme operates between the School and several colleges of physical education, leisure studies and recreation in England and the United States. Students of good academic ability may apply to participate in this study opportunity in their second or third year. The School has been involved with one-for-one

exchange programmes since 1972. Currently, the following partner institutions are active in the exchange:

- i) Chelsea School of Human Movement, Brighton Polytechnic, Eastbourne, United Kingdom;
- ii) Frostburg State College, Frostburg, Maryland, U.S.A.
- iii) State University of New York at Brockport, N.Y., U.S.A.

Contact the School of Recreation, Physical and Health Education for further information.

Bachelor of Science (Health Education)

Course of Study Overview

The Bachelor of Science in Health Education is a four year degree programme offered by the Health Education Division since 1975. The goal of health education is to promote, maintain or improve individual, family and community health through educational processes.

The responsibilities of health educators include: assessing health education needs; planning, conducting and evaluating health education programmes; coordinating health education activities and resources; promoting health education throughout the community; and professional development.

The BSc (HE) programme guides students in attaining: 1. knowledge, attitudes and practices conducive to a healthy lifestyle, 2. professional preparation for a career in school or community health education, and 3. academic preparation for advanced study and research in health education or health-related fields.

Employment and Further Study

Graduates of the BSc (HE) programme are qualified for employment with government departments, health agencies, health and fitness centres, health promotion businesses, industries, medical care centres, professional organizations, schools and senior citizens' centres.

Some graduates qualify to pursue further study in fields such as business administration, education, health administration, health education, health promotion, medicine, nursing, public relations and other areas concerned with health promotion.

Description of the Programme

BSc (Health Education) students earn their degrees by completing at least 120 credit hours of studies. They elect to major either in School Health Education or Community Health Education.

The Division requires those who major in School Health Education to minor in another subject that is applicable to a subject taught in the public schools. There are several ways to meet this Divisional requirement, and further information is available from the Division. In all cases, meeting the requirements for a "teaching minor" involves classes outside the Faculty of Health Professions.

Graduates who majored in School Health Education qualify for a Nova Scotia Teacher's Certificate (Level 5). Nova Scotia's officials have reciprocal agreements with counterparts in several other provinces to recognize teachers' certificates, thus improving the job mobility of teachers within Canada. Because Dalhousie University is one of the few institutions in Canada where school health education specialists are prepared, these agreements have special importance for these BSc (Health Education) graduates.

The Division requires Community Health Education majors to choose between two minor areas of concentration: Administration & Evaluation and Lifestyles Education. As is true of School Health Education majors, Community Health Education majors meet the Division's requirements by taking a variety of classes that take them beyond the Faculty of Health Professions' boundaries. Students who minor in Administration & Evaluation choose among classes in Accounting, Organizational Theory & Behaviour, Introduction to Statistics, and Research Methods. Students who minor in Lifestyles Education complete classes such as Psychological Aspects of Social Issues, Physiology of Exercise, Physical Fitness Assessment & Programme Design, Applied Anatomy & Kinesiology, Adventure-Based Experiential Education, Leisure & Special Populations, and Interpersonal Communications.

Failure to pass HEED 4493 or HEED 4495 may result in a student being required to take additional courses to make up for academic or skill level inadequacies prior to re-enrolling in those courses.

Health Education Classes Offered

HEED 1163 biostatistics and Epidemiology: This course provides an understanding of epidemiology, the basic science of preventive medicine and public health. The student is introduced to such concepts as the

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"epidemiological method" and its application to the study of the distribution and dynamics of disease in a population. By means of a problem solving approach, the class helps to provide some of the basic tools necessary to study the occurrence of disease in order to determine such issues as the severity of an outbreak, agents of the disease, and risk factors and causation.

Instructor: Staff
Format: Lecture, 3 hours
Enrolment: Restricted to Outpost and Community Health Nurses

HEED 1395 Introduction to Health Education: Taught September - November. While students are developing a fund of knowledge, understandings, attitudes and appreciations related to health and professional health education, they will be improving skills in library research, scholarly writing, information storage and retrieval, and public speaking. In addition to the regular classroom meetings, the class includes a series of seminars.

Instructor: Staff
Format: Lecture/discussion, 3 hours per week for the first 2/3 of the Fall term September - November; 2 credit hours; a required additional one-hour Health Education Skills seminar is conducted weekly in conjunction with the class.

Enrolment: Restricted to Health Education majors

HEED 1495 Fundamentals of School Health Education: Taught November - February. Through readings, presentations and discussions, students learn about the major components of the school health programme, including health services, provision of a healthful environment and school health instruction. Writing skills are emphasized. In addition to the regular classroom meetings, the class includes a concurrent series of seminars and a school health education field experience. The field experience occurs for two weeks following the University's spring examination period.

Instructor: Staff
Format: Lecture/discussion/seminar/field experience, 4 hours per week for the last 1/3 of the Fall term and the first 1/3 of the Spring term November - February, plus the Spring field experience; 2 credit hours

Enrolment: Restricted to Health Education majors

HEED 1595 Fundamentals of Community Health Education: Taught February - April. Students become familiar with the role of a community health educator. Topics include needs assessment, programme planning and

evaluation. Skills stressed in HE 1395 and HE 1495 will continue to be developed. In addition to the regular classroom meetings, the class includes a concurrent series of seminars and a community health education field experience. The community health education field experience occurs for two weeks following the school health field experience that is part of HE 1495.

Instructor: Staff
Format: Lecture/discussion/seminar/field experience, 4 hours per week in the last 2/3 of the Spring term February - April, plus the Spring field experience; 2 credit hours
Enrolment: Restricted to Health Education majors

HEED 2204 Consumer and Environmental Studies: This class introduces students to factors that cause changes in the environment and consequently affect health. The concepts of ecology and consumerism are examined and students are expected to apply these in their personal environments. The consumer's role and responsibilities in relation to personal health status are pursued.

Instructor: E. Belzer
Format: Lecture/discussion, 3 hours
Enrolment: Limited to 30

HEED 2250 Interdisciplinary Course in Human Nutrition: For class description, see Nursing 4800

Instructor: E. Lambie
Format: Lecture, 3 hours
Prerequisite: Biology 1000 or at the discretion of the professor
Cross-listing: NURS 4800B, PHSE 4950B, PHYT 3090B

HEED 2350 Drug Use In Society: International, national and regional issues of promotion, prevention, treatment and legislation of drug use are examined. Recreational, over-the-counter, and some prescription drugs will be considered.

Instructor: C.R. Mangham
Format: Lecture, 3 hours
Enrolment: Limited to 60

HEED 3225 Mental Health: Concepts and issues of mental health (biological, psychological and sociological) are explored through an examination of related theories, research, writings and practices. Emphasis is placed on mental health promotion, but mental illness and its treatment is included. Additional information is provided about the role of community mental health organizations and agencies. Some experiential techniques are used to demonstrate the function of self-awareness and interpersonal communication in mental health.

Instructor: D. McGuire
Prerequisite: Psychology 1000R or 1010R

Format: Seminar, 3 hours
Enrolment: Limited to 30

HEED 3351 Safety Education and First Aid: Students are introduced to the causes and effects of accidents and to strategies for reducing accidents through safety education. Upon successful completion of the first aid segments of the class students are certified in first aid and cardiopulmonary resuscitation.
Instructor: Staff
Format: Lecture/discussion/simulated practical experiences, 3 hours.
Enrolment: Limited to 30

HEED 3395 Community Health Education Planning: Issues and methods involved in the process of community health education planning are studied. Community analysis, goal and objective setting, developing education strategies and programme implementation and evaluation techniques constitute the components of planning covered in this class.
Instructor: L. Maloney
Format: Seminar, 3 hours
Prerequisites: HEED 1395, 1495, 1595
Enrolment: limited to 30, restricted to Health Education majors

HEED 4401 Selected Communicable Diseases: Interactions among people, their environment, and the causal agents of communicable diseases are explored. Specific communicable diseases are examined in order to discuss the role of health education in disease prevention.
Instructor: L. Barnes
Format: Lecture/discussion, 3 hours. Offered in alternate years beginning in 1991-92.
Prerequisite: Microbiology 1100A or Biology 1000R
Enrolment: Limited to 30

HEED 4402 Selected Chronic Degenerative Diseases: The causes, effects and prevention of significant degenerative diseases and chronic conditions are pursued. Attention is paid to the health needs of people with these conditions. The role of teachers and community workers is emphasized.
Instructor: Staff
Format: Lecture/discussion, 3 hours. Offered in alternate years beginning in 1992-93
Enrolment: Limited to 30

HEED 4412A or B Human Sexuality: This class is concerned with basic knowledge and understandings regarding biomedical, psychological, historical, legal, religious, semantic and comparative cultural aspects of human sexuality from conception to senility. Consideration is given to adjustment needs

and problems of children and adults in contemporary Canadian society and to educational efforts to help with them.
Instructor: E. Belzer
Format: Lecture/discussion, 3 hours

HEED 4425 Group Dynamics: Group dynamics, including leadership, decision making, group goals, communication, controversy, creativity, conflict, use of power, cohesion, group norms and problem solving, comprise the content of this class. The approach to learning is experiential. The potential of students will be utilized and each one is expected to function as a teacher and helper, as well as a learner.
Instructor: Staff
Format: Seminar, 3 hours
Enrolment: Limited to 20

HEED 4493 School Health Education Field Placement: During the first 10 weeks of the Spring term (January -March) students will intern in school settings on a full-time basis. During the concluding three weeks of the term, seminars will be conducted on campus and in community settings. They provide a forum for presenting information, sharing ideas and concerns, evaluating internships and preparing to find a job. This class is available to students who have completed an educational methods class in a subject taught in the public schools of Nova Scotia.
Instructor: Staff
Format: Field Placement/Seminar, 9 hours
Prerequisite: HEED 4494
Enrolment: Restricted to Health Education majors

HEED 4494 School Health Education Planning: Planning curricula for school health education is the focus of this class. Such planning includes: clarifying one's point of view about school health education, assessing content needs, structuring needed content, organizing the health instruction programme, stating goals and objectives, developing learning opportunities, assembling resources and selecting evaluation techniques.
Instructor: Staff
Format: Lecture/discussion, 3 hours
Prerequisites: HEED 1395, HEED 1495, and HEED 1595
Enrolment: Restricted to Health Education majors

HEED 4495 Health Education Internship: During the first 10 weeks of the class, students will intern in school or community health education settings on a full-time basis. Details about the internships are contained in the Internship Programme Handbook. During the concluding three weeks of the term, seminars will be conducted on campus and in community settings. They provide a forum for

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presenting information, sharing ideas and concerns, evaluating Internships and preparing to find a job.

Instructor: Staff

Format: Field placement/seminar, 15 hours

Prerequisites: HEED 3395 or HEED 4494

Enrolment: Restricted to Health Education majors

HEED 4496 Methods and Materials for Elementary School Health Education: If demand warrants, this class will be offered in alternate years. Students examine and develop various health education materials designed for the elementary grades. Resource material and teaching strategies are discussed in connection with drug education, diseases, mental health, consumer health, dental health, family living, safety education, personal hygiene or other emerging topics. Emphasis is on identifying local resources.

Instructor: Staff

Format: Seminar, 3 hours, offered in alternate years

Prerequisites: 12 credit hours in health content or public school teaching experience in a health-related area, or instructor's consent.

HEED 4497 Methods and Materials for Junior High School Health Education: Students become acquainted with a range of teaching methods and procedures used in junior high school health education. Resource material is discussed and developed in topic areas such as drug education, communicable and chronic diseases, aging, mental health, consumer and environmental health, family living and human sexuality, health counselling and guidance. Emphasis is on the use of local resources and materials.

Instructor: L. Barnes

Format: Seminar 3 hours offered alternate years beginning 1991-92.

Prerequisites: 12 credit hours in health content or public school teaching experience in a health-related area, or instructor's consent.

HEED 4498A/4499B An Interdisciplinary Approach to Gerontology: For class description, see HLTH 4900A/4910B.

Instructor: Staff

Format: Lecture, 3 hours

Cross-listing: HLTH 4900A/4910B, LEIS 4498A/4499B, OCCT 4417A/4418B, PHAR 4980A/4970B, PHSE 4498A/4499B, PHYT 4300A/4310B, SOSA 2080A.

HEED 4800C Directed Studies in Health Education: The purpose of the directed study is to allow students to develop an area of specialization with library, laboratory or field research under the tutelage of an appropriate faculty member.

Instructor: Staff

Format: Tutorial, 3 hours

Prerequisites: Fourth year status; a G.P.A. of at least 2.8; a "B" grade in an earlier class in the area of study (where appropriate); consent of advisor; consent of tutor.

HEED 3000B An Interdisciplinary Approach to Health Promotion: Intra- and interdisciplinary trends in the conceptualization, empirical investigation and practical implementation of health promotion will be examined. Students will consider historical, present and future perspectives of specific health promotion issues. Learners will have opportunities to develop skills in analyzing factors influencing the delivery of health promotion within the Canadian health care system. The contribution of different health professions to the study of Health Promotion will be assessed and the effectiveness of a teamwork approach will be evaluated.

Instructor: Staff

Format: 2 lecture hours/week plus lab

Bachelor of Science (Kinesiology)

Course of Study

The BSc programme in Kinesiology is designed to provide students with an opportunity for the scientific study of human movement. Emphasis of study is primarily in exercise physiology, biomechanics and motor performance. As part of their course work, students take science courses that will supplement their kinesiology courses in the three areas of emphasis. Generally, these science courses will be in the areas of biology, psychology, mathematics, chemistry or physics. For example, a student can complete a BSc programme in Kinesiology with an emphasis in exercise physiology and biology, as these are complementary areas of study. Other complementary areas are motor performance and psychology, biomechanics and mathematics/physics.

Both a general and honours programme are offered. Generally, it is possible to switch between the general and honours programmes. However, those who intend to switch from the general to the honours programme are advised to study carefully the difference in course requirements between the two programmes. To remain in the general programme the School's normal academic GPA

criteria apply. However, there are special GPA criteria for students in the honours programme. Please refer to Academic Regulation 22.3

Students receiving an honours degree must also complete an honours seminar and thesis in the fourth year.

Four Year Bachelor of Science (Kinesiology) General Programme

First Year	Credit Hours
Anatomy 102	3
Physiology 1010 or 2030	6
KINE 1230	3
Open Elective ¹	6
2 Electives only from the following: .	12
Biology 1000	
Chemistry 1100 or 1430	
Mathematics 1000/1010	
Physics 1100 or 1300	
Psychology 1000	
Total	30

Second Year	Credit Hours
KINE 2310	3
KINE 2320	3
KINE 2330	3
KINE 2485	3
Arts & Science Electives	12
Open Elective ¹	6
Total	30

Third and Fourth Years ²	Credit Hours
(select 30 credit hours each year)	
4 Classes from List A	12
2 Classes from List B	6
Arts & Science Electives ³	12
Open Electives ^{1 3}	21
KINE/PHSE Electives ³	9
Total	60

¹Electives may be chosen from the Faculties of Arts, Science, Health Professions, Management and Medicine. Biology 1000 is strongly recommended.

²Third and Fourth Year curricula are listed together to permit flexibility in scheduling classes available in alternate years.

³Electives must be at the 200/2000 level or above.

List A (Select 4)

- KINE 3414
- KINE 3419
- KINE 4440
- KINE 4486
- KINE 4478

KINE 4800 (if GPA is more than 3.0)

LEIS 3480

List B (Select 2)

PHSE 2220

PHSE 4410

PHSE 4497

LEIS 2110

LEIS 3157

LEIS 3420

LEIS 4490

LEIS 4494

LEIS 4498

LEIS 4499

Transfer Students: BSc (Kinesiology)

The second year program requirements for transfer students is as follows:

Anatomy 102	3
KINE 1230	3
KINE 2310	3
KINE 2320	3
KINE 2330	3
KINE 2485	3
Physiology 1010 or 2030	6
Open Elective ¹	6
Total	30

¹Electives may be chosen from the Faculties of Arts, Science, Health Professions, Management Studies and Medicine. Biology 1000 is strongly recommended.

The third and fourth year programmes for transfer students are the same as those outlined previously.

Four Year Bachelor of Science (Kinesiology) Honours Programme

First Year	Credit Hours
Anatomy 102	3
Physiology 1010 or 2030	6
KINE 1230	3
Mathematics 1000/1010	6
2 Electives only from the following: .	12
Biology 1000	
Chemistry 1100 or 1430	
Physics 1100 or 1300	
Psychology 1000	
Total	30

Second Year	Credit Hours
KINE 2310	3
KINE 2320	3

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KINE 2330.....	3
KINE 2465.....	3
Science Electives ²	12
Open Electives ¹	6
Total.....	30

Third and Fourth Years Credit Hours

(select 30 credits each year)

KINE 3414	
KINE 3419	
KINE 4440	
KINE 4468	
KINE 4476	
KINE 4800	
LEIS 3480	
Computer Science 1200 or 1400	
Required 2-year total from above list	21
Science Electives ³	12
Open Electives ³	27
Total.....	60

KINE 8880 Honours Research and Thesis

¹Electives may be chosen from the Faculties of Arts, Science, Health Professions, Management and Medicine. Biology 1000 is strongly recommended.

²Third and Fourth Year curricula are listed together to permit flexibility in scheduling classes available in alternate years.

³Electives must be at the 200/2000 level or above.

Classes Offered - BSc (Kinesiology) Programme

ANAT 102 Basic Human Anatomy: Taught within the Department of Anatomy in the Faculty of Medicine with emphasis on gross anatomy.

Instructor: Staff
Format: Lecture/Lab, 3 hours
Enrolment: Limited to 110

PHYL 1010 Human Physiology: This class is taught by the Department of Physiology and Biophysics and is an introductory physiology class for health professions students. The functions of body organs and body systems and the integration of functions in the whole organism are studied.

Instructor: Staff
Format: Lecture, 2 hours, lab/tutorial, 1 - 3 hours
Enrolment: Limited to 110

PHYL 2030 Human Physiology: The function of organs and body systems is presented through lectures and laboratory work. Special

emphasis is on the integration of function in the whole organism. Note: This class is designed for students who have completed at least one year of university study.

Instructor: Staff
Format: Lecture/Lab/Tutorial, 6 hours

KINE 1230 Human Growth & Development: A study of factors influencing human growth and development from birth to maturity, as revealed by observational and experimental studies.

Instructor: N. Kemp
Format: Lecture, 3 hours
Enrolment: Limited to 110

KINE 2310 Physiology of Exercise: This is an introductory class for students with a basic knowledge of anatomy and physiology. It concentrates on the respiratory, cardiovascular and neuromuscular systems in terms of their involvement during exercise, their adaptation to different types of training and how they limit performance during exercise in different environmental conditions.

Instructor: Staff
Format: Lecture/Lab, 3 hours
Prerequisites: Anatomy 102 and Physiology 1010 or Physiology 2030
Enrolment: Limited to 80

KINE 2320 Applied Anatomy and Kinesiology: Emphasis is on application of anatomical and kinesiological information to teaching and coaching experiences. The first half semester involves those bodily systems which produce movement, with emphasis on neuroanatomy. The second half semester consists of application of kinesiological principles so that activities can be interpreted effectively.

Instructor: L. Holt
Format: Lecture/Lab, 3 hours
Prerequisites: Anatomy 102 and Physiology 1010 or Physiology 2030
Enrolment: Limited to 80

KINE 2330 Motor Control & Learning: This class deals with efficiency in completing movements to achieve a desired goal. It involves systematic changes in perception of the environment, decisions about what movements to make, as well as changes in how these movements are carried out. This class covers what is known about these processes as well as how this information can be applied.

Instructor: L. Verabiuff
Format: Lecture/Lab, 3 hours
Prerequisite: Psychology 1000
Enrolment: Limited to 80

KINE 2465 Biomechanical Analysis: The focus of this class is on qualitative analyses of human movement from a mechanical perspective. The class is well suited to practitioners, and at the same time the class

will provide a solid base for those students wishing to pursue the study of biomechanics in greater depth.

Instructor: C. Putnam
Format: Lecture/Lab, 3 hours
Enrolment: Limited to 80

KINE 4414 Physical Fitness Assessment & Programme Design: Evaluation of various methods of physical fitness assessment, designing fitness programmes for diverse populations and identifying motivational techniques with emphasis on the areas of cardiovascular fitness, weight reduction, pre- and post-natal programmes and the elderly. In addition, laboratory work teaches the techniques of administering various fitness tests.

Instructor: P. Campagna
Format: Lecture/Lab, 3 hours
Prerequisite: KIN 2310
Enrolment: Limited to 45

KINE 4418 Physiological Bases of Sport: Human physiological adaptations to varying levels of exercise are studied. The conceptualization of the physiologic principles operating as the body's oxygen transport system adapts to meet metabolic demands of the working muscles provides the major emphasis. Attention is given to the metabolic, circulatory and pulmonary adjustments to the working state with a section devoted to the problems of acid-base homeostasis during exercise.

Instructor: Staff
Format: Lecture/Lab, 3 hours
Prerequisite: KIN 2310
Enrolment: Limited to 45

KINE 4440 Seminar - Research Interpretation and Undergraduate Paper: For those who plan to pursue graduate studies, the application of the processes of science to the field are discussed in a series of lectures to introduce the student to the language and methods of science in general. The assignments lead to the proposing and conducting of a small investigation appropriate to student interests which is written in the format of a journal appropriate to the question addressed. Selected studies are presented to the class.

Instructor: Staff
Format: Lecture/Discussion/Lab, 3 hours
Enrolment: Limited to 45

KINE 4466 Advanced Biomechanics: This class takes a quantitative approach to understanding human movement, muscle function and the structure of biological tissue from a mechanical perspective. Concepts presented in the class will be illustrated with examples taken from the areas of sport,

exercise, sports medicine and rehabilitation. Students will be introduced to several techniques used in biomechanics research.

Instructor: C. Putnam
Format: Lecture/Lab, 3 hours
Prerequisite: KIN 2465
Enrolment: Limited to 45

KINE 4476 Skilled Performance: This class is primarily concerned with examining the main concepts of skilled performance; that is, those factors which appear to be related to the effective and efficient acquisition of pre-determined goals on a regular basis. For the most part this class uses an information processing focus to study motor skills and the potential influences on their performance. However, one consequence of the material should be the recognition that any attempts to isolate skilled behaviour into separate perceptual, cognitive and motor skills can occur only at a superficial level. In addition, an attempt is made to use appropriate examples from sport, industrial and clinical settings to illustrate particular concepts.

Instructor: J. McCabe
Format: Lecture, 3 hours
Prerequisite: KIN 2330
Enrolment: Limited to 45

KINE 4800 A, B, C, R, S or T Directed Studies in Kinesiology: Senior undergraduate students develop an area of specialization under the direction of a faculty member.

Instructor: Staff
Format: experimental research (laboratory experiment) or other research study, 3 or 6 hrs

Prerequisites: 1. third- or fourth-year status;

2. a GPA of 3.0 plus a "B" grade or better in an upper level course in the area in which the research will be conducted (e.g. biomechanics, exercise physiology, motor behaviour);

3. Research Methods;

4. Statistics;

consent of instructor and Division Head.

Intention to register for a Directed Study should be confirmed with the divisional secretary by April 1st of the preceding academic year. literature research, 3 or 6 credit hours

Format II:

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Prerequisites: the same as those for experimental research directed studies described under Format I above except that classes in research methods and statistics are not required.

NOTE: Students may not take more than a total of 6 credit hours of experimental research or literature research directed studies.

KINE 8880 Honours Research & Thesis: At the conclusion of an honours programme a student's record must show a grade which is additional to those for the required classes. This grade may be obtained through a comprehensive examination, the presentation of a research paper (which may be an extension of one of the classes) or such other method as may be determined by the School. The method by which this additional grade is obtained is referred to as the Honours Qualifying Examination. A pass/fail grading system will be used.

Students who wish to meet this requirement by the presentation of a research paper must meet the same prerequisites as experimental research for directed studies (KINE 4800 above).

Five Year Combined Bachelor of Physical Education/ Bachelor of Education Degree

The combined BPE/BEd programme prepares students for a teaching career. The basis of the BPE/BEd degree therefore consists of both theory classes and pedagogical classes.

Studies in the general education area occupy about one-third of the total curriculum and have three overlapping purposes. The first is to contribute to a liberal education. The second is to provide background studies of specific importance to Physical Education. The third is to provide for deeper study in another academic discipline. This choice will depend upon the student's interest, although, if a general school teaching qualification is desired, the student must choose a subject being taught in the school system in which he/she plans to teach. Students must complete at least 4 full credits in the second subject, 3 of which must be beyond the 1000 level.

The theory classes are intended to provide a foundation for understanding the administrative, historical, measurable, philosophical and scientific aspects of Physical Education.

Programme of Study

The programme is jointly administered by the School of Recreation, Physical and Health Education and the School of Education at Dalhousie University. It is considered an integrated programme. Students are therefore expected to meet the BEd requirements before they are accepted into the joint BPE/BEd programme. For specific admission details refer to the "Admissions Information" section of this calendar.

To continue in the BEd programme, a 'B' average in the second subject area and a 'B' average overall in Arts and Science is required each year. Graduates of the BPE/BEd programme will receive a teaching license from the Nova Scotia Department of Education. Graduates without the BEd will not be eligible to receive a teaching license.

Year I	Credit Hours
Physical Education/Kinesiology Classes:	
PHSE 1195.....	3
KINE 1230.....	3
LEIS 2110	3
Anatomy 102.....	3
Physiology 1010 or 2030	6
Psychology 1000 or 1010	6
Arts & Science Electives ¹	6
Total.....	30

Year II	Credit Hours
Physical Education/Kinesiology Classes:	
KINE 2310.....	3
KINE 2320.....	3
KINE 2330.....	3
PHSE 2220.....	3
PHSE 2295.....	3
Education Classes:	
Educational Psychology	
4311A or 4312B.....	3
Arts & Science Electives ¹	12
Total.....	30

Year III Elementary	Credit Hours
Physical Education/Kinesiology Classes:	
KINE 2465.....	3
PHSE 2384.....	3
PHSE 3402 ³	6
Education Classes:	
Foundations	
History of Education	3
Educational Psychology	3
Educational Methods at Mt. St. Vincent University:	

Reading/Language Arts	6
Electives:	
Arts, Science, Education	6
Total	30

Year III Secondary	Credit Hours
Physical Education/Kinesiology Classes:	
KINE 2486	3
PHSE 2384.....	3
PHSE 3398 ³	6
Education Classes:	
Foundations	
History of Education	3
Philosophy of Education	3
Educational Psychology.....	3
Arts & Science Electives ¹	9
Total	30

Year IV Elementary	Credit Hours
Education/ Kinesiology Classes:	
PHSE 4250.....	3
PHSE 4395.....	3
Education Classes:	
Foundations	
Philosophy of Education	3
Sociology of Education.....	3
Educational Methods at Mt. St. Vincent University	
Mathematics.....	3
Social Studies or Science	3
ED 4901A ⁵	3
ED 4903B ⁵	3
Arts & Science Electives ¹	3
Open Elective ²	3
Total	30

Year IV Secondary	Credit Hours
Physical Education/ Kinesiology Classes:	
PHSE 4250.....	3
PHSE 4395.....	3
PHSE/KINE/LEIS/HEED Elective.....	3
Education Classes:	
Foundations	
Sociology of Education.....	3
Methods in Second Subject Area.....	6
ED 4903B ⁵	3
Arts & Science Electives ¹	6
Open Elective ²	3

Total	30
Year V Elementary	Credit Hours
Physical Education/ Kinesiology Classes:	
PHSE 4496.....	12
PHSE 4497 or LST 4490.....	3
PHSE/KINE/LEIS/HEED Electives	9
Arts & Science Electives ¹	3
Education Classes:	
ED 4902A ⁶	3
Total	30

Year V Secondary	Credit Hours
Physical Education/ Kinesiology Classes:	
PHSE 4496.....	12
PHSE 4497 or LST 4490.....	3
PHSE/KINE/LEIS/HEED Electives	9
Education Classes:	
ED 4902A ⁶	3
Open Elective	
(Education/Arts/Science)	3
Total	30

¹Electives may be chosen from the Faculties of Arts, Science, Health Professions (excluding Physical Education, Kinesiology, Leisure Studies and Health Education classes), Management Studies and Medicine.

²Electives may be chosen from the Faculties of Arts, Science, Health Professions, Management and Medicine.

³includes 4 weeks of teaching internship in the Halifax Metro area at the end of the Spring term, following examinations.

⁴PE 4496 students are assigned full-time to schools in the Metro area as of September 1 or whenever school begins, until approximately December 5. No other classes may be scheduled during this period.

⁵includes 4 weeks of student teaching in chosen second subject area in the Halifax Metro area at the end of the Spring term, following examinations.

⁶includes 3 weeks of full-time field experience, beginning approximately at the end of October. The field experiences in PE 4496 and ED 4902 will be at the same school.

Field Experiences

Field experiences in the primary subject area of Physical Education and the second subject area in Education are indicated as part of the courses listed above. These experiences will include observation and involvement in school or community programmes. Students who intend to gain teacher certification must complete the practice teaching experience successfully.

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Students must provide their own transportation for their field work.

Activity Programme

Activity classes are held on Tuesday and Thursday mornings all year in Years 1 through 3. These are lab sections of PHSE 1195, 2295, 3398 and 3402. In addition, specialization courses are completed in Year 4 in Dance and a team sport.

Special Considerations

If a student is interested in special programmes such as remedial physical education or outdoor education, every effort will be made to provide a field experience that would include work in these areas.

Classes of Instruction - BPE/BEd Programme

ANAT 102 Basic Human Anatomy: Taught within the Department of Anatomy in the Faculty of Medicine with emphasis on gross anatomy.

Instructor: Staff
Format: Lecture/Lab, 3 hours

PHYL 1010 Human Physiology: This class is taught by the Department of Physiology and Biophysics and is an introductory physiology class for health professions students. The functions of body organs and body systems and the integration of functions in the whole organism are studied.

Instructor: Staff
Format: Lecture, 2 hours, lab/tutorial, 1 - 3 hours

PHYL 2030 Human Physiology: The function of organs and body systems is presented through lectures and laboratory work. Special emphasis is on the integration of function in the whole organism. Note: This class is designed for students who have completed at least one year of university study.

Instructor: Staff
Format: Lecture/Lab/Tutorial, 6 hours

PHSE 1195 Introduction to Teaching: Examines the profession of teaching with emphasis on the area of Physical Education. Purposes of education, teacher roles and a brief introduction to the teaching process are included. Includes one week of observation and teaching at the end of the spring term.

Instructor: L. Verabioff
Format: Lecture, 3 hours
Enrolment: Limited to BPE/BED students only

PHSE 2220 Measurement & Evaluation in Physical Education: An introduction to the fundamentals involved in measurement and evaluation, including writing objectives, designing and administering tests, organizing

and analyzing test results. Tests used to measure physical fitness, specific motor skills and health knowledge are investigated.

Instructor: J. Hoyle
Format: Lecture/lab, 3 hours
Enrolment: Limited to 60

PHSE 2295 Instructional Techniques in Physical Education: A continuation of work begun in PE 1195 with emphasis on instructional techniques. Class management and planning will be areas of major concentration. The class includes theoretical content as well as appropriate field work related to teaching.

Instructor: A. Soott
Format: Lecture/field work, 3 hours
Prerequisite: PE 1195
Enrolment: Limited to BPE/BED students only

PHSE 2384 Physical Activity for Disabled Persons: An introductory overview of current practices, philosophies and issues related to physical activity for the disabled. The class emphasizes knowledge and understanding of various disabling conditions in relation to physical activity.

Instructor: L. Holt
Format: Lecture, 3 hours
Enrolment: Limited to 60
Cross-listing: EDUC 4684

PHSE 3398 Practical Studies Secondary: This class is designed for students who wish to specialize in secondary physical education. Students completing the class will have practiced basic skills for teaching team, individual, dual and fitness activities. Analysis of teacher behavior and practice in using a variety of teaching styles receive emphasis. Visits to schools are included. Four weeks of full-time student teaching are included at the end of the spring term.

Instructor: L. Verabioff
Format: Lecture/lab/field work, 6 hours
Prerequisite: PE 2295
Enrolment: Limited to BPE/BED students only

PHSE 3402 Elementary Physical Education: This class is designed for students who wish to specialize in elementary physical education. Special projects with young children are developed by the class. Class includes field trips to innovative school, preschool and community organization programmes. Four weeks of full-time student teaching are included at the end of the spring term.

Instructor: L. MacGregor
Format: Lecture/lab, 6 hours
Prerequisite: PE 2295
Enrolment: Limited to BPE/BED students only

Recreation, Physical & Health Education 401

PHSE 4250 Organization & Administration of Physical Education & Recreation: This class focuses on the administrative and planning processes involved in the development and implementation of recreation and leisure programmes in both community and public school settings. Students will have the opportunity to apply and test programming principles through practical experiences in planning, organizing, and administering special events.

Instructor: C. Savoy
Format: Lecture, 3 hours
Enrolment: Limited to 60

PHSE 4396 Curriculum Planning and Development: An introduction to basic curriculum theory and programme development principles. Developing a curriculum philosophy, objectives, course and unit plan and programme evaluation are covered. Appropriate field work is included.

Instructor: A. Yarr
Format: Lecture/field work, 3 hours
Prerequisite: PE 3398 or PE 3402 or permission of instructor
Enrolment: No limit

PHSE 4410 Care and Prevention of Athletic Injuries: The class offers a fundamental understanding of the maintenance of health (personal hygiene, nutrition, prevention of common ailments and injuries). More specifically it will deal with first aid, sports injuries, their prevention and treatment. Students will acquire practical skills in taping techniques and cardiopulmonary resuscitation.

Instructor: Staff
Format: Lecture/lab, 3 hours
Enrolment: Limited to 60

PHSE 4476 Psychology of Sport and Physical Activity: This class offers an awareness and understanding of the phenomena involved in mental preparation in sport and physical activity. It will systematically analyze, investigate and assess psychological skills, attributes and preparation in these areas and their applications in other environments. Emphasis will also be placed upon personal experience and practical application.

Instructor: C. Savoy
Format: Lecture, 3 hours
Prerequisite: KIN 2330 or permission of instructor
Enrolment: Limited to 60

PHSE 4496 Teaching Practicum in Physical Education: During the fall term students are placed in schools for full-time student teaching. Students are required to obtain experience in applying basic teaching skills as well as becoming familiar with how schools are organized and administered. Being able to analyze teacher behaviour to provide assistance to fellow students is also expected. CPR/First Aid certification is a

required part of this course. Students will also be required to attend a Leadership Outdoor Camp in the early fall. In addition, as future professionals, students will be expected to attend the annual professional conference for the Teachers Association for Physical Education. Seminars will be scheduled on a weekly basis to provide opportunities to share student teaching experiences and to discuss topics of relevant interest.

Instructor: L. MacGregor
Format: Seminar/field work, 12 hours
Prerequisite: PE 3398 or PE 3402
Enrolment: Limited to BPE/BED students only

PHSE 4497 Philosophy for Physical Educators: An introduction to "thinking with concepts" provides a foundation for choice analysis in a seminar presentation. An introduction to existentialism is presented, with emphasis on choice, freedom and responsibility.

Instructor: A. Yarr
Format: Lecture, 3 hours
Enrolment: Limited to 60

PHSE 4498A/4499B An Interdisciplinary Approach to Gerontology: For class description, see HLTH 4900A/4910B.

Instructor: Staff
Format: 3 hours
Cross-listing: HEED 4498A/4499B, HLTH 4900A/4910B, LEIS 4498A/4499B, OCCT 4417A/4418B, PHAR 4960A/4970B, PHYT 4300A/4310B, SOSA 2060A.

PHSE 4800A or B or C or R or S or T Directed Studies in Physical Education: Senior undergraduate students develop an area of specialization under the direction of a faculty member.

Instructor: Staff
Format: 3 or 6 hours
Prerequisites: third- or fourth-year status; a GPA of at least 3.0 a "B" grade in an earlier class in the area in which the project will be conducted (where appropriate); consent of Instructor and Division Head. Intention to register for a Directed Study should be confirmed with the divisional secretary by April 1st of the preceding academic year. Students may not take more than a total of 6 credit hours of directed studies.

Bachelor of Recreation

Program Description The focus of the Bachelor of Recreation degree is recreation administration. The objectives of the program are as follows:

1. to provide the student with a broad educational exposure to various social science and humanities disciplines (e.g. Psychology, Sociology, Economics, Political Science, Anthropology, History);
2. to familiarize students with current social science-based research in leisure studies, including an understanding of research methods and statistics;
3. to provide the student with the necessary skills and knowledge for entry into the roles of leadership, advocacy, consultancy and education in recreation and leisure services;
4. to provide the student with the opportunity to design a specific interest area within recreation administration. These specializations will be based on student interest, market demand and availability of appropriate classes. Examples include: therapeutic recreation, experiential education, arts administration, sport administration, commercial recreation, tourism, municipal administration and leisure counselling. The program of studies is developed in consultation with the student's advisor.
5. to provide the necessary background to enable students to pursue graduate work in leisure studies, management studies or the social sciences and humanities;

Bachelor of Recreation Programme of study

The minimum requirement for entry into the Bachelor of Recreation programme is successful completion of one year university with a grade point average of 2.3 or higher. First year students interested in the Bachelor of Recreation programmes should consider the following courses:

First Year	Credit Hour
Psychology 1000R, 1010R or 1050R or equivalent	6
Sociology 1000 or 1200 or equivalent.....	6
Political Science 1100 or Economics 1100 or equivalent	6
Electives	12
Total.....	30

NOTE: One of the above classes must be a writing class.

Students need to complete the above courses prior to graduation. Students may be accepted to the Bachelor of Recreation programme after successfully completing one year of university with a grade point average of 2.3 without some of the above pre-requisites. The student should recognize that this would require a longer period to complete the requirements for the Bachelor of Recreation degree.

Second Year	Credit Hours
LEIS 2110	3
LEIS 2126*	3
LEIS 2127	3
LEIS 2128	3
LEIS 2326	3
LEIS 2361	3
LEIS 2382	3
LEIS 2384	3
Electives.....	6
Total.....	30

* LEIS 2126A requires students to attend a residential camp. The purpose of the camp is to orient students to the BReo program at Dalhousie and to the field of recreation and leisure services. Detailed information on the dates, location and costs associated with the camp is available from the Leisure Studies Division, School of Recreation, Physical and Health Education.

Third Year	Credit Hours
LEIS 3296	3
LEIS 3360	3
LEIS 3381	3
LEIS 3382	3
LEIS 3420	3
LEIS 3480	3
* Leisure Studies OR Other Electives.....	12
Total.....	30

* Leisure Studies Electives
LEIS 3157 History of Dance
LEIS 3491 Sociology of Leisure

Fourth Year	Credit Hours
LEIS 4495	3
LEIS 4497	12
At least 3 of the following:	9
LEIS 4361A*	
LEIS 4362A	
LEIS 4363A**	
LEIS 4426A**	

LEIS 4482B**

LEIS 4492B

LEIS 4494B

Electives 6 or 12

Total..... 30

NOTE: A minimum of 24 credit hours of electives must be taken outside of the school. A minimum of 12 credit hours of electives must be taken within the designated area of concentration.

*Offered alternate years beginning 1991-92

** Offered alternate years beginning 1992-93

Classes Offered - BRec Program

A. Recreation Theory Classes

LEIS 2110 History of Leisure: This class aims to make students familiar with the historical roots of the leisure pursuits of human kind. Sport, dance and recreation in ancient and primitive societies are explained and critically analyzed as are activities in early civilizations.
 Instructor: A. Young
 Format: Lecture, 3 hours
 Enrolment: Limited to 110

LEIS 2126A Introduction to Leisure Studies: An understanding of the place and potential of leisure in Canadian life is essential if we are to move beyond the conviction that only labour is to be valued. This foundation class introduces leisure forms and concepts including play, sport, culture and social leisure. It provides an overview of leisure service delivery and issues related to access to meaningful leisure opportunities. Opportunities for increasing writing skills, library utilization, verbal expression and computer skills are provided. A practicum is included.
 Instructor: Staff
 Format: Lecture/required lab experience, 3 hours
 Enrolment: Restricted to Bachelor of Recreation Students

LEIS 2127 Psycho-Social Theory and Leisure: This class will provide an introductory analysis of leisure in modern society from sociological and social psychological perspectives. The role of leisure in the everyday life of individuals will be discussed in terms of social relationships, social interaction and theories of attitude and motivation, etc. In addition, since the role and function of leisure is affected by political, economic and cultural systems, a main-level perspective on leisure will also be provided by focusing on topics such as the influence of modern technology, the commercialization of leisure, the influence of social institutions and of the mass media.
 Instructor: Staff

Format: Lecture, 3 hours
 Prerequisite: SOSA 1000 or SOSA 1200 and Psychology 1000
 Enrolment: Limited to 50

LEIS 2128 Socio-Cultural Bases of Physical Activity: The course will provide an introduction to the sociological and cultural analysis of sport, exercise, and physical activity. The course will provide an overview of diverse topics as well as detailed analysis of selected topics. Topics will be examined at theoretical, empirical and issue-related levels and will include sociological theories, competition in sport, deviance in sport, violent behavior, gender relations, interpersonal relations, and sport and politics.
 Instructor: Staff
 Format: Lecture, 3 hours
 Enrolment: Limited to 50

LEIS 2326 Leisure and the Arts: The purpose of this class is to provide students with a perspective on the variety of artistic and cultural activities enjoyed by participants and spectators, including theatre, music, dance, arts and crafts, photography and mass media. The class will address theoretical and applied questions related to the arts and leisure, including value access, patterns of participation and the pursuit of excellence. A practicum will be included.
 Instructor: Staff
 Format: Lecture, 3 hours
 Enrolment: Limited to 50

LEIS 2361B Recreation Administration I - Introduction to Recreation Administration & Program Planning: An introductory course in administrative processes, management theories and the planning and designing of recreational programs and leisure experiences.
 Instructor: N. Ipson
 Format: Lecture, 3 hours
 Enrolment: Limited to 50

LEIS 2382 Adventure-Based Experiential Education: Outdoor education in one form or another is included as an integral part of most recreational programs. However, there are values of outdoor adventure activities which go beyond the usual rationale for recreation programs. These include personal development, citizenship training, leadership development and community service. This class will explore some of the educational philosophies which rely on an experiential base. Included will be an opportunity for hands-on experiences in developing, planning and evaluating an adventure-based program which has potential beyond the traditional recreation outcomes. A practicum will be included.
 Instructor: A. Richards
 Format: Lecture, 3 hours
 Enrolment: Limited to 50
 Cross-listing: EDUC 4842

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LEIS 2384 Leisure and Special Populations:

An introduction of current philosophy, issues and practices relating to leisure opportunities for persons who, due to physical, mental and social conditions, have difficulty gaining access to community services. An analysis of leisure behaviours, barriers and needs will be provided through the classroom and a practicum.

Instructor: R. Lyons
Format: Lecture, 3 hours
Enrolment: Limited to 50

LEIS 3157 History of Dance: This class traces the development of dance in Western Civilization from primitive times to the present day. The changing role of dance in society will be discussed, as will its relationship to the other arts. Sample dances from the different periods of history will be taught to illustrate the changing styles and patterns of dance.

Instructor: P. Richards
Format: Lecture, 3 hours
Enrolment: Limited to 50
Cross-listing: Music 3361

LEIS 3296 Leadership and Community Development: This course will focus primarily on the function of leadership and the process of small group dynamics as applied to the recreation professional. Emphasis will be placed on the achievement of individual and group goals in recreation settings. In addition, effective leadership of individuals and groups within a community, through direct experience and observation, will be emphasized.

Instructor: C. Ballem
Format: Lecture, 3 hours
Prerequisites: LEIS 2128 or consent of instructor
Enrolment: Limited to 50

LEIS 3360 Analysis of Leisure Delivery: The organization and delivery of leisure services in Nova Scotia and Canada are examined with emphasis on critical analysis of decision making processes, social impact and alternative planning methodologies.

Instructor: C. Ballem
Format: Lecture, 3 hours
Prerequisites: LEIS 3361 or consent of the instructor
Enrolment: Limited to 50

LEIS 3361 Recreation Administration II - Facility & Personnel Management: This course is designed to provide insight into the organizational structure and governance in leisure service agencies, address the process and functions of personnel management, and review trends in facilities design, development and maintenance.

Instructor: N. Ipson
Format: Lecture, 3 hours
Prerequisites: LEIS 2361

Enrolment: Limited to 50

LEIS 3362 Recreation Administration III - Fiscal Management & Marketing: This course is designed as a fundamental analysis of the budget process and to provide insight into innovative fiscal management, marketing and privatization.

Instructor: N. Ipson
Format: Lecture, 3 hours
Prerequisite: LEIS 3361
Enrolment: Limited to 50

LEIS 3420 Introduction to Research Methods:

The purpose of this class is to give students a basic understanding of the logic and goals of social science research. The class will focus on factors that need to be taken into account in designing or evaluating research studies. Both qualitative and quantitative methods will be discussed with an emphasis on interview and survey research and on evaluation research.

Instructor: L. Maloney
Format: Lecture, 3 hours
Enrolment: Limited to 40

LEIS 3480 Introduction to Statistics: This class will provide an introduction to basic statistical concepts through the use of practical examples and hands-on experience. Both descriptive and inferential statistics will be reviewed, with emphasis on the analysis and interpretation of cross-tabulation tables, correlations and simple regression.

Instructor: L. Maloney
Format: Lecture, 3 hours
Enrolment: Limited to 50

LEIS 3491 Sociology of Leisure: This will be an advanced undergraduate class on societal influences on leisure. Building on some of the material covered in Psycho-Social Theory and Leisure, the class will discuss various concepts and approaches which provide a framework for understanding the changing role of leisure in Canadian society. Students will be exposed to some of the current theoretical and methodological debates in the field of leisure research.

Instructor: Staff
Format: Lecture, 3 hours offered alternate years beginning 1990-91
Prerequisite: LEIS 2127 or at least two Sociology/Social Anthropology classes
Enrolment: Limited to 80

LEIS 4361 Sport Administration: The administration of sport at the national, provincial, community and club level will be examined. Critical to this overview will be an in-depth consideration of the administration of amateur sport in Nova Scotia and the role of government, sport governing bodies and educational institutions. Major issues

confronting amateur sport at the national and international levels, such as commercialization, marketing and sponsorship in sport, will also be examined.

Instructor: C. Ballern

Format: Lecture, 3 hours, offered alternate years beginning 1991-92.

Prerequisite: LEIS 2128 or consent of the instructor

Enrolment: Limited to 30

LEIS 4362 Park Management & Natural Resource Development: Basic issues in park management and natural resource development are examined with a focus on planning, design, development and maintenance of the outdoor environment for leisure activity.

Instructor: Staff

Format: Lecture, 3 hours

Prerequisite: LEIS 2128 and LEIS 2361 or consent of the instructor

Enrolment: Limited to 30

LEIS 4363 Arts Administration: Styles of management of theatres, arts and cultural centres, museums will be presented along with issues related to opportunities for participation in the arts and cultural activities. Features such as the study of cultural events, communication with performers and establishment of cultural facilities will be discussed. A practicum is included.

Instructor: Staff

Format: Lecture, 3 hours, offered alternate years beginning 1992-93

Prerequisite: LEIS 2326 or consent of the instructor

Enrolment: Limited to 30

LEIS 4426 Leisure Enhancement: III and Disabled Persons: This class provides students with an understanding of disabling conditions and their leisure implications. It provides instruction in leisure facilitation techniques such as assessment procedures, task analysis, activity analysis and other program enhancement strategies through classroom lectures and a practicum.

Instructor: Staff

Format: Lecture, 3 hours offered alternate years beginning 1992-93

Prerequisite: LEIS 2384 or consent of the instructor

Enrolment: Limited to 30

LEIS 4492 An Experiential Approach to Youth Development: Youth as a sector of society and as a stage in human development is of great significance in the study of leisure. Particularly relevant is the issue of unemployment and underemployment which has created a number of problems such as low self-worth, alcohol abuse, teenage

suicide, etc. There are programs being developed to address these problems, many of which are experientially based, e.g., Outward Bound, study service, service learning and national service. This class will study the phenomenon of youth development in the light of experiential educational approaches. During the class there will be an expectation that the students will meet and interact with a variety of youth. Practicum included.

Instructor: A. Richards

Format: Lecture, 3 hours offered alternate years beginning 1992-93

Prerequisite: LEIS 2382 or consent of the instructor

Enrolment: Limited to 30

LEIS 4492 Leisure Counselling & Education: Simply defined, leisure counselling is a helping process which facilitates interpretive, effective and/or behavioural changes in others toward the attainment of their leisure well being. This class will provide students with a basic introduction to leisure counselling and education. It will include an historical perspective, definitions, philosophies, models, issues and an exposure to the education and counselling techniques.

Instructor: R. Lyone

Format: Lecture, 3 hours

Prerequisite: LEIS 1126 and LEIS 2127 or consent of the instructor

Enrolment: Limited to 30

LEIS 4494 Canadian Sport History: This class analyzes the historical antecedents of sport in Canadian life. Sports such as football, basketball and track and field are discussed, as well as sport heroes and issues including the historical role of women and minority groups in sport.

Instructor: A. Young

Format: Lecture, 3 hours

Prerequisite: LEIS 2110 or consent of the instructor

Enrolment: Limited to 40

LEIS 4495 Leisure Issues Seminar: This senior level class covers a broad range of issues facing leisure studies and the recreation profession. Students have the opportunity of gaining in-depth knowledge through dialogue about and investigation of selected issues.

Instructor: C. Ballern

Format: Seminar, 3 hours

Prerequisite: LEIS 3296, 3360, 3420 and 3480, or the consent of the instructor

Enrolment: Restricted to Bachelor of Recreation students

LEIS 4496 Internship in Recreation Administration: This is a supervised student placement in an approved community agency

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for approximately twelve weeks, normally undertaken during the Summer between third and fourth years. The field experience and an in-depth report which includes the student's activities and agency analysis, are required. In addition, students are required to participate in an hour-and-a-half weekly seminar in the Fall term.

Instructor: C. Ballem

Format: Field experience/Fall term seminar, 6 hours

Enrolment: Restricted to BRec students who registered in the programme in the fall of 1990 or prior to that.

LEIS 4497 Internship in Recreation

Administration: This course is an extended placement during the Fall term and requires a special investigative project in conjunction with the agency.

Instructor: C. Ballem

Format: Placement/Fall term, 12 hours

Enrolment: Restricted to 4th Year BRec students

LEIS 4498A/4499B An Interdisciplinary

Approach to Gerontology: For class description, see HLTH 4900A/4910B

Instructor: Staff

Format: Lecture, 3 hours

Cross-listing: HEED 4498A/4499B, HLTH 4900A/4910B, O CCT 4417A/4418B, PHAR 4960A/4970B, PHSE 4498A/4499B, PHYT 4300A/4310B, SOSA 2060A.

LEIS 4900A or B or C or R or S or T Directed Studies in Leisure Studies: Senior undergraduate students develop an area of specialization under the direction of a faculty member.

Instructors: Staff

Format: Library survey or other research study, 3 or 6 hours

Prerequisites: Fourth year status, a GPA of at least 3.0, a "B" grade in an earlier class in the area in which the project will be conducted (where applicable), consent of advisor, consent of faculty. Intention to register for a Directed Study should be confirmed with the divisional secretary by April 1st of the preceding academic year. Students may not take more than a total of 6 credit hours of directed studies.

B. Required Arts and Science Classes

Sociology 1000, 1100 or 1200 An Introductory Sociology or Social Anthropology Class: For class description please refer to the Sociology and Social Anthropology Department entry in this calendar.

Instructor: STAFF

Format: Lecture, 6 hours

Psychology 1000 Introduction to Psychology: For class description please refer to the Psychology Department entry in this calendar.

Instructor: STAFF

Format: Lecture, 6 hours

Political Science 1100 Introduction to Political Science: For class description please refer to the Political Science Department entry in this calendar.

Instructor: STAFF

Format: Lecture, 6 hours

OR

Economics 1100 Introduction to Economics:

For class description please refer to the Economics Department entry in this calendar.

Instructor: STAFF

Format: Lecture, 6 hours

Electives

Classes may be taken as electives across divisions with permission from the student's adviser. Classes are described under the program in which they are designated, i.e., Health Education (HEED), Kinesiology (KINE), Leisure Studies (LEIS) and Physical Education (PHSE).

Russian

Location: 1376 LeMarchant Street,
Halifax, N.S.
Telephone: (902) 494-3679
Fax: (902) 494-1997

Chair

J.A. Barnstead (494-3679)

Undergraduate Advisor

J.A. Barnstead (494-3679)

Professor

Y.Y. Glazov, PhD (Oriental Inst), F, (Moscow)

Associate Professor

I. Vitins, BA (Mich), PhD (Calif)

Assistant Professor

J.A. Barnstead, BA (Oakland), AM (Harvard)

Introduction

The Russian Department offers classes in Russian language, literature, and culture. Since Russia plays a crucial role in today's world and makes important contributions in a wide variety of scientific, technical, and humanistic fields, knowledge of its linguistic and cultural backgrounds can prove advantageous in many areas of study. Glasnost' and perestroika have significantly widened opportunities for using Russian in business, law, science, and government.

In the language classes emphasis is placed on gaining a thorough grasp of Russian grammar combined with practical competence in speaking, reading, and writing. Sections are small and intensive. Classroom work is supplemented by computer-assisted language learning programmes and audio-visual materials at the Learning Laboratory. Study of Russian literature begins with a general survey intended for first or second year students, followed by monograph, period, and genre classes. Literature classes are generally offered in both English and Russian in order to give as many students as possible from other disciplines the opportunity to become acquainted with this important part of Russian life.

Classes in Russian culture and civilization are intended to introduce students to art, architecture, music, religion, and other areas of Russian life which are necessary to understand the language and literature. Films, guest speakers, and evenings of Russian poetry are scheduled periodically. The

Dalhousie Association of Russian Students organizes a variety of events throughout the year.

Major or honours students may, with the approval of the Department of Russian, take up to one year (5 full credits) of work at a University in Russia and receive credit at Dalhousie. Qualified students are urged to participate in the Russian Studies Programme, founded by Dalhousie, which enables Canadian students to study for a semester at St. Petersburg State University, or the Moscow Pedagogical University.

Degree Programmes

Classes in the Russian Department are open to students either (1) as electives in any degree programme; or (2) as constituents of a major or honours degree in Russian; or (3) with classes in another discipline forming part of a combined honours degree.

Classes Offered

Classes in Language

RUSS 1000R Elementary Russian: For students who have little or no previous knowledge of the Russian language. Equal emphasis is placed on developing oral and reading skills with a sound grammatical basis.

Format: Instruction/drill 5 hours
Prerequisite: None
Enrolment: 25/section

RUSS 2000R Intermediate Russian: A continuation of RUSS 1000R. Oral and reading skills and a further knowledge of grammar are developed through study and discussion of Russian texts.

Format: Instruction/drill 5 hours
Prerequisite: Russian 1000R or equivalent
Enrolment: 25/section

RUSS 3000R Advanced Russian: Conducted in Russian. Following a thorough review, the class concentrates on expanding all aspects of the student's knowledge of Russian grammar. Texts are read extensively and intensively. Discussion and compositions are based on the assigned readings.

Format: Lecture and discussion 5 hours
Prerequisite: Russian 2000R or equivalent
Enrolment: 25

RUSS 3010B Grammar: (See listing under Russian Studies Programme.)

RUSS 3030B Conversation: (See listing under Russian Studies Programme.)

RUSS 3050B Vocabulary Building, Translation, Reading: (See listing under Russian Studies Programme.)

RUSS 3100A Intensive Russian Grammar: (See listing under Russian Studies Programme). (This is a six-credit class).

RUSS 4000R The Structure of Contemporary Standard Russian: Required for honours candidates. Conducted in Russian. Systematic study of the structure of Russian: analysis of special problems in phonology, morphology, syntax, and stylistics. Tailored to the individual needs of the student, with emphasis on practical applications of linguistic insights.

Format: Lecture and discussion 3 hours
Prerequisite: Russian 3000R or permission of the instructor
Enrolment: Unlimited

Classes in Literature and Culture

Note: Classes marked * are not offered every year. Please consult the current timetable on registration to determine if these classes are offered.

***RUSS 2020A or B Nineteenth Century Russian Literature and Culture:** Conducted in English. The class traces developments in classical Russian literature, as well as in the Russian arts: painting, sculpture, theatre, and music. Religious and secular ideas of 19th century Russia are also discussed.

Format: Lecture and discussion 2 hours
Prerequisite: None
Enrolment: 35

RUSS 2050R Survey of Russian Literature: Conducted in English with section in Russian for majors. Required for majors and honours candidates. This class satisfies the university writing requirement. An overview of the history of Russian literature, from its Byzantine roots to the present day. The first semester includes works by Pushkin, Lermontov, Gogol', Turgenev, Dostoevsky, and Tolstoy, among others; the second begins with Chekhov and Gorkii and ends with an examination of the current literary scene.

Format: Lecture and discussion 3 hours
Prerequisite: None
Enrolment: 30

***RUSS 2070A or B Russian Literature and Culture after Stalin's Death:** Conducted in English. The literary, cultural, and political history of Russia after Stalin's death in 1953. Among the major issues considered are the significance of Stalin's death, the "Thaw" and de-Stalinization, Pasternak, Solzhenitsyn, Nadezhda Mandelstam and Sakharov. Revival of the intelligentsia and religious trends. Relationships of Russia and the West. Official and non-official culture.

Format: Lecture and discussion 2 hours
Prerequisite: None
Enrolment: 25

***RUSS 2100A or B Pushkin and his Age:** Conducted in English with section in Russian for majors. A close study of the poetry and prose of Russia's greatest poet, and other writers of the "Golden Age of Russian Poetry." Works to be read will include the major narrative poems, *Eugene Onegin*, the "Little Tragedies," *Boris Godunov*, *The Balkin Tales*, as well as the poetry of Baratynskii, Batiushkov, Del'vig, and Yazykov. No knowledge of Russian is required.

Format: Lecture and discussion
Prerequisite: None
Enrolment: Unlimited

***RUSS 2190R Survey of Russian Theatre:** Conducted in English with a section in Russian for majors. An overview of Russian writing for the theatre, with emphasis on the nineteenth and twentieth centuries. The first semester examines plays by Pushkin, Griboedov, Gogol', Ostrovsky, Turgenev, and Sukhovo-Kobylin; the second semester includes Chekhov, Gorkii, Andreev, Bulgakov, Shvarts, Almatov and one current play.

Format: Lecture and discussion 2 hours
Prerequisite: None
Enrolment: 25

***RUSS 2240A or B Theories of Literature:** Conducted in English. This class surveys Russian thought about literature from mediaeval times to the end of the nineteenth century, then concentrates on a more detailed study of twentieth century theories. Emphasis is on the complex interrelationships of modern Russian theories of literature with their Western counterparts, e.g. Formalism and American "New Criticism". Topics treated include Formalism, early Marxist criticism, Socialist Realism, post-Stalin Marxist criticism, Structuralism, and the Tartu School of semiotics. Student discussions and papers apply the principles of a given school to practical criticism of works of their choice, demonstrating the strengths and weaknesses of each theory.

Format: Lecture and discussion 2 hours
Prerequisite: None
Enrolment: Unlimited

***RUSS 2340A or B Russian Modernism:** Conducted in English. A study of trends in literature and the arts at the turn of the century. Known as "The Silver Age", this is one of the most innovative and dynamic periods in Russian culture.

Format: Lecture and discussion 2 hours
Prerequisite: Russian 2050R or equivalent
Enrolment: 20

***RUSS 2500A or B Tolstoy:** Conducted in English. An introduction to the work of this enigmatic spiritual giant of Russian literature; the impact of his philosophy and writing on

world literature and thought. Reading includes *War and Peace*, *Anna Karenina*, and *Resurrection*.

Format: Lecture and discussion 3 hours
Prerequisite: None
Enrolment: 25

***RUSS 2520A or B Chekhov and Turgenev:** Conducted in English. Close analysis and discussion of the major works of Turgenev, sensitive portrayal of socio-political and psychological issues of the second half of the nineteenth century in Russia, and Chekhov, unequalled short-story writer and radical innovator in modern theatre.

Format: Lecture and discussion 3 hours
Prerequisite: None
Enrolment: 25

***RUSS 2600A or B Russian Satire and Humour:** Conducted in English. Russian satirical and humorous literature written within the last two centuries. Russian satire and humour have made a great contribution to the world's treasure in this genre. Students read masterpieces by Gogol (*Dead Souls*) and Dostoevsky (*The Devils*). Lectures cover some of the immortal comedies of Russian literature and the early humorous stories of Chekhov. For the period after the 1917 Revolution stories by Soviet satirists, including Zoshchenko and Bulgakov, are discussed as well.

Format: Lecture and discussion 2 hours
Prerequisite: None
Enrolment: 25

***RUSS 2750A or B Dostoevsky and the Russian Idea:** Conducted in English. Dostoevsky's novels are of the highest importance in understanding the fate of Russia and the thoughts of other great Russian authors and thinkers. *Crime and Punishment* and *The Brothers Karamazov* are taken as the basis for discussion. The works of I. Turgenev and Lev Tolstoy are discussed together with the ideas of such great Russian philosophers, V. Solovyev and N. Berdyaev.

Format: Lecture and discussion 2 hours
Prerequisite: None
Enrolment: 30

***RUSS 2760A or B Dostoevsky and Western Literature:** Conducted in English. With all his love for Russia, Dostoevsky treasured the West and its literature. It is impossible to understand Dostoevsky and his main novels, including *The Idiot* and *The Devils*, without *Hamlet* by Shakespeare, *Don Quixote* by Cervantes, *Faust* by Goethe, some plays by F. Schiller, etc. The class traces the influence of Western ideas on Dostoevsky and his influence on such Western thinkers as Nietzsche and Freud.

Format: Lecture and discussion 2 hours
Prerequisite: None
Enrolment: 30

RUSS 3090A Soviet Society Today: (See listing under Russian Studies Programme.)

RUSS 3121A 19th Century Russian Prose and Poetry: (See listing under Russian Studies Programme.)

RUSS 3122A 20th Century Russian Prose and Poetry: (See listing under Russian Studies Programme.)

***RUSS 3250A or B Literature of Revolution - The 1920s in Russian Literature:** Conducted in English. A study of experiment and submission during one of the most exciting, diverse, and frustrating periods in Russian letters. "Socialist realism" was not yet official doctrine; innovation in literature was tolerated. Writers openly pondered the role of the individual and culture in the new collective society. Close reading and discussion of texts by Pasternak, Babel, Zamyatin, Oleha, Plinyak, Zoshchenko, and Bulgakov.

Format: Lecture and discussion 2 hours
Prerequisite: None
Enrolment: 25

***RUSS 3270A or B The Russian "Heroine":** Conducted in English. The strong spiritual and moral force which Russian women have exerted on their society is richly reflected in literature. The class focusses on the portrayal of several literary heroines and discusses their impact on both the literary imagination and society. Their number includes Pushkin's Tatyana, Dostoevsky's Sonya Marmeladova and Nastasya Filippovna, Tolstoy's Anna Karenina, Gorky's Mother and Bulgakov's Margarita.

Format: Lecture and discussion 2 hours
Prerequisite: None
Enrolment: 25

***RUSS 3330A or B The Russian Short Story:** Conducted in English. On the basis of ten to twelve Russian masterpieces in the short story genre, students have a chance to trace the development in this field from Pushkin and Gogol, through Turgenev, Tolstoy, Dostoevsky to the best short stories of post-revolutionary writers, including I. Babel, M. Zoshchenko, B. Plinyak, A. Platonov.

Format: Lecture and discussion 2 hours
Prerequisite: None
Enrolment: 25

***RUSS 3500A or B Gogol and his Tradition:** Author of "Overcoat," "Nose," *Taras Bulba*, *Dead Souls*, Gogol has been proclaimed "a pathological liar and honest anatomist of the soul, a June jester and tragic poet, realist and fantast". An in-depth study of this major writer and his impact on the work of Dostoevsky, Kafka, Bely and Bulgakov.

Format: Lecture and discussion 3 hours
Prerequisite: None
Enrolment: 25

***RUSS 4300R Russian Poetry:** Conducted in Russian. Required for honours candidates. A combination of an introduction to the theory of poetry with close analysis of masterpieces of nineteenth and twentieth century Russian poetry chosen to fit the interests of the individual student.

Format: Lecture and discussion
Prerequisite: Permission of the instructor
Enrolment: Unlimited

RUSS 4950A or B, RUSS 4960A or B, RUSS 4990R Russian Special Topics: Conducted in Russian. Offers the student an opportunity to work with an advisor in researching subjects which are not regularly taught in the Department. Past topics have included Old Church Slavonic, the historical phonology and morphology of Russian, and Russian symbolism. Students who wish to register for a specific programme should consult the chair of the Department.

Prerequisite: Permission of the instructor

Russian Studies Programme

Coordinator

Yuri Glazov (494-3679)

Participating Faculty

Yuri Glazov (Professor of Russian)
 Norman Pereira (Professor of History)
 Ieva Vitne (Associate Professor of Russian)
 John A. Barnstead (Assistant Professor of Russian)

Introduction

The Russian Studies Programme, the oldest one of its kind in Canada, is a special inter-disciplinary programme of instruction which allows Dalhousie students (as well as students from other Canadian universities) to undertake intensive study of the Russian language, both here and in the Russia. In order to participate, students must be able to demonstrate competence in the Russian language equivalent to two years of university classes (at Dalhousie these are RUSS 1000R and RUSS 2000R) with a mark of "B" or better. The duration of the programme is one academic year, the first half of which is at Dalhousie, the University of Alberta, or some other Canadian university, the second half of which is at the Moscow Pedagogical University, or St. Petersburg State University. Enquiries and applications should be addressed to the Administrator of the Programme.

Classes at Dalhousie, September to December

RUSS 3090A Soviet Society Today:

Conducted in Russian.
Instructor: N.G.O. Pereira
Cross-listed: HIST 3090A

RUSS 3100A Intensive Russian Grammar: Conducted in Russian. Approximately one-half of class time is devoted to grammar and reading. The remaining time is devoted to conversation and pronunciation. The class meets for five two-hour sessions each week. There is one written composition per week of 2-3 pages. The instructor works closely with individual students. This is a six-credit class.
Instructor: Soviet language specialist
Format: lecture 10 hours

RUSS 3121A 19th Century Russian Prose and Poetry: Conducted in Russian. Students read, translate, and critically interpret representative works of the nineteenth century. Original texts are supplied with vocabularies and grammatical notes.

Instructor: Staff
Format: Lecture and discussion, 3 hours
Exclusion: RUSS 3120A

RUSS 3122A 20th Century Russian Prose and Poetry: Conducted in Russian. Students read, translate, and critically interpret representative works of the twentieth century. Original texts are supplied with vocabularies and grammatical notes.

Instructor: Staff
Format: Lecture and discussion, 3 hours
Exclusion: RUSS 3120A

Classes at the Moscow Pedagogical University, or St. Petersburg State University, February to June

RUSS 3010B Grammar: Intensive study of the finer points of Russian grammar. Topics include verbs of motion, aspect, impersonal constructions, government and agreement, and other themes. This is a six-credit class.

RUSS 3030B Conversation: Systematic development of conversational ability on everyday themes: transport, city services, theatre, sport, shopping, the library, the educational system, the structure of the government, etc. This is a six-credit class.

RUSS 3050B Vocabulary Building, Translation, Reading: Extensive study of Russian lexicon and/or work in translation; analysis of journalistic and literary texts. This is a three-credit class.

Science Foundation Year

The Science Foundation Year (SFY) is an integrated 5-credit programme that introduces students to the disciplines that make up the Faculty of Science. SFY uses a thematic approach to teach basic concepts in an interdisciplinary fashion. It starts with a historical perspective of the development of scientific ideas in order to introduce to the students the ideas of paradigm shifts, how scientific concepts are influenced by cultural biases, and how they change as new information becomes available. These aspects of science are stressed throughout the curriculum. The programme then studies the evolution of the universe, the solar system, Earth, and life to present the fundamental principles underlying nature and to teach the necessary scientific concepts from each discipline. From there, it proceeds to consider human development and the impact human societies have had on earth through a study of environmental issues. Throughout SFY mathematical principles and techniques are developed and applied in the context of the material being covered. The programme also fulfill the student's writing requirement.

The emphasis of SFY is "hand on", or "teaching science as it is practised". Stress is placed on learning scientific methodology and how the different disciplines interrelate to explain various phenomena. The workload of SFY is approximately equal to that of a typical science first year; e.g., 15 hours of "lectures" and 12 hours of "laboratories, tutorials and field trips".

Students wishing to enter this programme normally must have a minimum high school (Grade 12) average of 80%. The maximum enrolment is 100 students.

Students are assessed continuously throughout the year through quizzes, laboratory reports, presentations, etc. Students receive a single letter grade for the entire 5-credit programme. In addition, each student receives a written evaluation detailing the student's strengths and weaknesses.

For further information contact:

Dr. Leigh Mazany, Faculty of Science Dean's Office, 3rd Floor, Arts and Administration Building

Telephone:

(902) 494-3421

Fax:

(902) 494-1957

email:

LMAZANY@ADM.DAL.CA

Science, Interdisciplinary

SCI 1000R Introduction to Environmental Studies: The intention of this full-credit course is to provide students with an entry-level introduction to the scope and importance of environmental issues that affect us at the local, regional, national and global levels. The course content will deal with three groups of environmental issues; (i) the human population and sociocultural patterns, (ii) sustainability of the use of renewable and non-renewable natural resources, and (iii) environmental degradation caused by pollution and disturbance. The course will be multi-disciplinary in nature, with specialists dealing with issues that reflect their particular expertise. However, this course will also build upon the connections among specific disciplines. The instructional format will involve two lectures per week. Grading will be by examination (one at the end of each term), by essay (one per term), by short written assignments, and by participation in discussion seminars.

Instructor: Staff

Enrolment: 100

SCI 1200R: Science for Non-Science Students: An Overview of the Cosmos, Earth, and Life: The class meets the science distribution requirement for BA students. There are no prerequisites and the class does not count as a prerequisite for any other science class. Students are introduced to selected concepts central to each of the disciplines of Geology, Biology, and Physics, and the origins of our universe, Earth and life on Earth. Emphasis is placed on developing an understanding of the scientific method, its limitations, and its application in society. The principles will be related to environmental concerns. For example the properties of light and radiation are applied to a discussion of global warming. The principles involved in ocean and atmospheric circulation are used to understand present problems of climate and pollution. Biological principles are applied to understand the consequences of changing habitats on biodiversity.

Instructor: E. Angelopoulos, P. Reynolds, R. Maroh

Cross-listings: ESCI 1200R, PHYS 1200R, BIOL 1200R

SCI 3000R Science Fundamentals: Science 3000R is an interdisciplinary class for Honours students in the Faculty of Science. It stresses the motivations, skills, methodologies, and responsibilities of scientists, provides extensive formal instruction and practice in the written and

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oral presentation of scientific material, and promotes common bonds among scientists facing the complex problems of the future.

The class material covers three broad areas:

Scientific History, Philosophy, and Methodology consisting of Our Roots: A Brief History of Science; Major Scientific Revolutions; The Scientific Method: Experimental Design and Execution; Comparison of Scientific Methodologies; Logic: Inductive and Deductive Reasoning; Methods of Handling and Interpreting Numerical Data

Scientific Communication Skills dealing with Awareness of the Scientific Literature: Library, Set Theory, Database Searching Skills; Communication of Scientific Results I: Scientific and Technical Writing; Communication of Scientific Results II: Oral Presentations; Maintaining Competence after Graduation: Journals, Conferences, Exchanges, Electronic Bulletin Boards

Scientific Politics and Practicalities in which we discuss Research Environments: Government, Private Sector, University; Scientific Drives: Curiosity, Necessity, Money, Fame; Basic vs. Applied Research; Research Costs; Funding of Scientific Research in Canada: Grants vs. Contracts; Science and Technology: Patents and Technology Transfer; Science in the Service of People; Social Responsibilities of Scientists; Ethical Issues for Scientists: Working with People, Animals, Data; Major Scientific Questions of Today

Instructors for this class are experts from a wide range of disciplines, both from within the university and outside. For further information, contact the co-ordinator: D.B. Clarke, Department of Earth Sciences, LSC 3050, Telephone (902) 494-3438, FAX (902) 494-6889, E-mail CLARKE@AC.DAL.CA

The following classes address the subject matter in an interdisciplinary manner. Consult department listings for full descriptions.

BIOL 3601A Nature Conservation

CHEM 3303A or B Materials Science

COMP 1000A or B Microcomputer Applications

ECO 3338A Introductory Econometrics I

MATH 1001A; 1002B Mathematics for Liberal Arts Students

MATH 2600A or B Theory of Interest

SCI 1200R Science for Non-Science Students

Sociology and Social Anthropology

Location: South-East Corner of South and Seymour Streets, Halifax, N.S.
Telephone: (902) 494-8593
Fax: (902) 494-2897

Chair
R.A. Apostle (494-2089)

Undergraduate Advisor
T. Li (494-3889)

Professors
R.A. Apostle, BA (Simon Fraser), MA, PhD (Calif)
J.H. Barkow, AB (Brooklyn), AM, PhD (Chi)
D.H. Clairmont, BA, MA (MoM), PhD (Wash U)
J.L. Elliott, BA (Wells), MA (Kansas), PhD (Pitt)
H.V. Gensberg, BA (Brandeis), A.M., PhD (Princ)
V. Thlesen, BA (Man), MA, PhD (Wis)

Associate Professors
M.E. Binkley, BA, MA, PhD (Tor) (Associate Dean of the Faculty of Arts and Social Sciences)
P.M. Butler, BA, MA, PhD (Tor)
D.H. Elliott, BA (Yale), PhD (Pitt)
T.J. Li, BA, PhD (Cantab)
V.P. Miller, BA (Calif), MA, PhD (Calif)
J.G. Morgan, BA (Nott), MA (MoM), DPhil (Oxon)
C.J. Murphy, BA (St FX), MA (Dal), PhD (Tor)
J. Stoizman, BA (Ore), MS (Fla), PhD (Ore)

Assistant Professors
P.T. Gardiner Barber, BA, MA (Auck), PhD (Tor)
P.G. Clark, BA, MA (MoM), PhD (UBC)
D. Findlay, BA, BSW, MA, PhD (MoM)
J. Jerman, BA, MA (Tor), PhD (Cantab)

Adjunct Professors
F.G. Cohen, BA (Harv/Rad), MEd (Harv), PhD (Minn)
M.M. Cohen, Jr., BA (Mich), DMD (Tufts), MSD, PhD (Minn)
R.C. Kalll, BA (Dal), BD, MA (Tor), PhD (MoG)
L. Keeden, MA, PhD (Chi)
D. Locker, BA (Carl), MA (Wat), PhD (MoM)
J.J. Mangalam, BSo, MSc (Panjab), PhD (Cornell)
B. Raymond, MA (Calif), PhD (Chi)

Research Associates
A.F. Davis, BA (St. Mary's), MA (Man), PhD (Tor)
A.G. Thomson, BA, BEd, MA (Dal), PhD (Cantab)

Introduction

Social Anthropology and Sociology are related and overlapping disciplines. Although in some universities they are found in separate departments, this Department and many of its classes blur the distinction between them and emphasize the areas of overlap. The Department is committed to a programme which stresses the areas of convergence between the two disciplines.

Sociology

As a social science, sociology seeks to apply the scientific method to human behaviour. In doing so, it makes two assumptions, that human social life exhibits regularity and recurrent patterns, and that people are essentially social animals. The sociological enterprise focuses upon social relationships, social institutions, and processes of social change. No single approach to these complex phenomena has been found adequate. As a result, a wide range of explanatory models and perspectives has evolved.

Sociology provides a context within which students learn to think critically about their social environment; become aware of the impact of social forces on their lives and the lives of others; and develop skills of analysis useful in understanding and managing their social environment. Many students find a sociology major helpful in preparing for social work, nursing, personnel management, and other occupations dealing directly with people. A well-trained sociologist will be acquainted with overlapping areas in Social Anthropology.

Social Anthropology

Anthropology is a diverse discipline whose branches study the human species in all of its physical, cultural, and linguistic diversity in both space and time. It consists of four sub-disciplines: Archaeology, Linguistics, Physical Anthropology, and Social Anthropology. The major focus is upon classes in Social Anthropology, although classes in other areas may be offered.

Social Anthropology is a strongly comparative field, which is concerned with the complete range of human societies in all historical and geographic settings. In the past, emphasis in Social Anthropology was on non-industrial and small-scale societies, but in recent years attention has been paid to

industrial and industrializing societies and to the various groups that comprise them. Social Anthropology aims at generalizations by comparing structures and processes in major institutions within societies (kinship, political, economic, and religious) as well as between societies. A well-trained social anthropologist will be acquainted with overlapping areas in Sociology.

Career Options

Career possibilities in sociology and social anthropology include research and other positions in government, industry, or university, and teaching at the high school or university levels.

Degree Programmes

The department offers a major and an advanced major in Sociology and Social Anthropology leading to the BA degree. It offers honours BA degrees in Sociology and in Social Anthropology.

Honours BA Programme

An Honours degree is normally the required preparation for graduate study in Sociology and Social Anthropology. Students interested in honours programmes should consult the Department's Undergraduate advisor, Dr. T. Li, as early in their course of studies as possible.

Students may choose to register in an honours programme either in Sociology or in Social Anthropology. At least nine classes, and no more than eleven classes, beyond the introductory level must be taken in the area of concentration. Each programme consists of several required classes (see below), other classes selected according to the student's interests in consultation with the Undergraduate Advisor, and an honours thesis paper. Students with the honours concentration Sociology may not declare Social Anthropology as their minor subject; students with the honours concentration Social Anthropology may not declare Sociology as their minor subject. (See College of Arts and Science Regulations 11.5 for general information and requirements).

Required Classes for Honours Degree

Social Anthropology Programme

SOSA 2010A Introduction to Social Research, SOSA 2011B Research Design, SOSA 2250A or B Introduction to Social Anthropological Theory, at least one credit (or at least two half credits) in a geographical area class(es) (SOSA 2370A or B People and Cultures of the World I, SOSA 2380A or B People and Cultures of the World II, SOSA 2350A or B Native Peoples of Canada, SOSA 2380A or B Native Peoples of the United

States, SOSA 2390R Social Anthropology of the Middle East, SOSA 3185A or B Issues in the Study of Native Peoples of North America), SOSA 3415A Social Statistics, SOSA 4000R Seminar in Social Anthropology, and SOSA 4590R Honours Seminar in Social Anthropology (two credits).

Sociology Programme

SOSA 2010A Introduction to Social Research, SOSA 2011B Research Design, SOSA 2240A or B Introduction to Sociological Theory, SOSA 3115B Research Methods, SOSA 3415A Social Statistics, SOSA 3401A History of Sociological Thought, SOSA 3405B Contemporary Sociological Theory, and SOSA 4500R Honours Seminar in Sociology.

The honours thesis paper is produced for the class SOSA 4500R (Sociology) or SOSA 4590R (Social Anthropology). This fulfils the College of Arts and Science Honours Qualifying Examination requirement.

Combined and Unconcentrated Honours

Combined honours programmes can be arranged between Sociology or Social Anthropology and some other appropriate discipline. Combined honours in Sociology and Social Anthropology, however, is not possible. Students wishing to arrange combined or unconcentrated honours programmes are advised to seek the counsel of the departments involved as early as possible. Students graduating with an Advanced Major before June 30, 1993 must follow the previous regulations.

Advanced Major

For an Advanced Major in Sociology and Social Anthropology (20 credits, 4 year degree) the student must fulfil all the requirements of the Major (BA degree) programme in Sociology and Social Anthropology, but with a minimum of 6 credits in Sociology and Social Anthropology beyond the 1000 level (and a maximum of 9 such credits) including a minimum of 3 credits beyond the 2000 level.

BA Degree

Students enrolled in the BA (i.e., three-year) degree programme must take at least four and no more than eight classes beyond the introductory level in Sociology and Social Anthropology. Depending on their interests, they may take mainly sociology classes or mainly anthropology classes, or they may combine the disciplines.

Required Classes

- **Introductory Level:** Either SOSA 100R, SOSA 1050R, SOSA 1100R, or SOSA 1200R.
- **Theory:** Either SOSA 2240A or B or SOSA 2250A or B.
- **Research Methods:** SOSA 2010A or B is required. SOSA 2011A or B is recommended.
- **Two full credits** in classes beyond the 2000 level in Sociology and Social Anthropology.

Suggested Class Structure

Year I: SOSA 100R, SOSA 1050R, SOSA 1100R, or SOSA 1200R; at least one introductory class in Economics, Political Science, Psychology, History or Biology; and three other classes chosen from fields other than Sociology and Social Anthropology.

N.B. One class must satisfy the writing requirement (College of Arts and Science Regulations 11.3).

Year II: SOSA 2010 A or B, SOSA 2011 A or B, and SOSA 2240 A or B or SOSA 2250 A or B; 1 1/2 - 2 other classes in Sociology and Social Anthropology; and two electives.

Year III: Two classes at the 3000 level in Sociology and Social Anthropology; one other class in Sociology and Social Anthropology; and two electives.

N.E. One class of the 15 credits must satisfy the language requirement (College of Arts and Science Regulations 1.2) or the requirement may be met as specified in the Regulations.

Canadian Studies Programme

The Department is cooperating with several other departments in offering a Canadian Studies Programme. Interested students should contact Professor P. Clark.

International Development Studies

The Department is cooperating with several other departments and with Saint Mary's University in offering a BA and Honours BA in International Development Studies. Interested students should contact Professor J. Barkow.

Women's Studies Programme

The department is cooperating with several other departments in the Women's Studies Programme. Interested students should contact Professor Pauline Gardiner Barber.

Classes Offered

Please Note:

- No student may receive credit for more than one introductory level class (SOSA 100R, SOSA 1050R, SOSA 1100R, SOSA 1200R) in Sociology and Social Anthropology.
- All students (whether Sociology and Social Anthropology majors or not) must have SOSA 100R, or SOSA 1050R, or SOSA 1100R, or SOSA 1200R as a prerequisite for any class at the 2000 or higher levels, or obtain permission from each instructor involved. There may also be additional prerequisites required. No student may receive credit for more than one introductory level class (SOSA 100R, SOSA 1050R, SOSA 1100R, or SOSA 1200R) in Sociology and Social Anthropology.
- The Foundation Year Programme of the University of King's College is an acceptable alternative to Sociology and Social Anthropology introductory classes for prerequisite purposes.
- SOSA 1050R fulfils the first-year writing requirement.
- Some classes listed may not be offered in a given academic year. Consult the timetable for details.

Note: Classes marked * may not be offered every year. Please consult the current timetable on registration to determine if these classes are offered.

SOSA 1000R Culture and Society: An introduction to the comparative study of human society from the parallel perspectives of Sociology and Social Anthropology. The principal focus is on continuity and change in a variety of societies ranging from simple hunting and gathering societies to highly complex industrial societies.

Format: Lecture 3 hours
Prerequisites: None
Exclusion: SOSA 1050R, SOSA 1100R, SOSA 1200R
Enrolment: Sections with maximum 60 and maximum 150

***SOSA 1050R Explorations in Culture and Society:** This class covers the same topics as SOSA 1000R but partly in a seminar format. There are bi-weekly written assignments. This class fulfils the first-year writing requirement.

Format: Lecture and seminar 3 hours
Prerequisites: None
Exclusion: SOSA 1000R, SOSA 1100R, SOSA 1200R
Enrolment: 30 students

SOSA 1100R Introduction to Anthropology: This class introduces students to all subfields of anthropology while emphasizing the socio-cultural. Topics considered include: the variety of human cultures and societies and

how they are organized and function, the relationship between ecology and culture, human evolution, nonhuman primate behaviour, principles of archaeology, and the study of languages around the world as they relate to the cultures of which they are part.

Format: Lecture 3 hours

Prerequisite: None

Exclusion: SOSA 1000R, SOSA 1050R, SOSA 1200R

Enrolment: 60 students

SOSA 1200R Introduction to Sociology: This class introduces students to basic sociological concepts, the logic of social inquiry, and major theoretical and methodological issues in the field.

Substantive class contents include the study of culture, socialization, deviance, social organizations, institutions, social roles, and demography. Emphasis is on the study of modern industrial societies with special attention given to Canadian society.

Format: Lecture 3 hours

Prerequisite: None

Exclusion: SOSA 1000R, SOSA 1050R, SOSA 1100R

Enrolment: Sections with maximum 60 and maximum 150

***SOSA 2000A or B Archaeology: An Introduction:** This class covers the following topics: archaeology and its relationship to history and prehistory, the origins and growth of the discipline of archaeology, the application of archaeological techniques in the field of prehistory, the excavation of a site, the establishment of a chronological framework, and the reconstruction of the historical past.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 60 students

SOSA 2010A or B Introduction to Social Research: This class provides an introduction to basic research skills used by anthropologists and sociologists to investigate and analyze social phenomena. The class is organized into three modules each of four weeks duration. The first module emphasizes the effective use of existing information, with particular emphasis on library research techniques and resources. The second module provides an introduction to computers and demonstrates a variety of computer based research activities. The third module stresses the evaluation of research and provides the student with both the skills and opportunity to assess critically and professionally the work of empirical anthropologists and sociologists.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 50 students

SOSA 2011A or B Research Design: The class is organized around four 3-week modules, representing a survey of the major research designs employed in anthropology and sociology. Module I deals with the design of experiments and simulations; Module II examines historical and comparative research designs; Module III treats survey-based designs; Module IV examines designs based upon fieldwork and observation.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R and SOSA 2010A or permission of the instructor

Enrolment: 50 students

***SOSA 2030R Deviance and Social Control:** Groups make formal and informal rules in an attempt to regulate and make predictable the behaviour of their members. Violations of these rules occur in many different ways and stem from various causes. This class examines both the processes by which groups make rules and the reasons why these rules are violated. Specific issues such as crime, delinquency, narcotic addiction, alcoholism, prostitution, suicide, and minority group relations are discussed in this context.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 150 students

***SOSA 2040R Social Stratification:** Aspects of social inequality in modern industrial society. The formation of classes, status groups, and organized political expressions is considered. Questions of the distribution of power and wealth in society, the existence of power elites or governing classes, the impact of bureaucracy on class relations, the extent to which major economic inequalities have been reduced in this century, and problems of the mobility of individuals and groups through the stratification systems are analyzed. Theoretical discussions in the class are largely concerned with the ideas of Karl Marx and Max Weber, but attention is also paid to contemporary theoretical approaches to stratification.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 60 students

***SOSA 2050R Sociology of Religion:** The relations between religious beliefs and human behaviour and social structures. Major themes include: the impact of social structure on the development of belief systems; the question of whether beliefs guide and direct human behaviour; the formal organization of religious institutions; and social psychological

considerations of religious behaviour. The primary focus is on current religious movements in Canada.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 80 students

***SOSA 2060A or B Social Gerontology:** A general introduction to social gerontology, in which emphases will be placed upon the historical and philosophical development of the study of aging in Canada, theories of aging, current social and economic programmes for the elderly both in Canada and to some extent cross-culturally, and various pertinent social-psychological aspects of the aging process. The class familiarizes students with some of the problems people experience as a consequence of aging in Canadian society and provides an understanding of the socio-economic factors relevant to these problems.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Cross-listing: HEED 4498A, HLTH 4900A, LEIS 4498A, OCCT 4417A, PHAR 4980A, PHSE 4498A, PHYT 4300A

Enrolment: 80 students

***SOSA 2070R Socialization:** Socialization is the process by which a society's values and customs are perpetuated, passed along to the younger generation. This is seen as the function of certain institutions, such as the family, the churches, and the schools. These, however, require support from the larger social milieu. Our own rapidly changing society appears to be at a point of crisis in this regard. Recent social changes have undermined traditional means by which children acquire a sense of allegiance to their elders, and take to themselves the society's major values.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 80 students

***SOSA 2080R Communities:** An examination of a wide variety of territorially based residential groups such as the large metropolitan centre, the rural village, and the intentional community. Major themes include: evolution of the modern city, urbanization, rural depopulation, ecology of the city, neighbourhood social networks, behaviour in public places, minority subcommunities, and urban planning.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 80 students

***SOSA 2100R Ecology and Culture:** This class deals with the ways in which different environments affect how people live, relate to one another, think, and organize themselves. The major focus is on how cultural choices are influenced and constrained by the relationships among ecology, technology, and how people are making a living. Examples of hunter-gatherer, horticulturalist, rancher, and farmer cultures are used as illustrations.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 80 students

***SOSA 2110R Canadian Society:** An analysis of selected aspects of Canadian society employing theoretical perspectives and empirical materials to develop a composite view of the society as a whole through understanding the interrelationships among its parts. Major foci include the integration and survival of Canadian society, structural change, and the management and consequences of inequality. Prospects for the future of Canada are discussed in terms of these characteristics.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Cross-listing: Canadian Studies

Enrolment: 80 students

***SOSA 2120A or B Minority Groups:** The social status of minority groups is examined in the light of contemporary theories of prejudice and discrimination. The societal consequences of discrimination are considered with respect to their effect on both minority and majority groups. Emphasis is on an analysis of Canadian minorities.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 80 students

***SOSA 2140A or B Industrial Sociology:**

This class deals with the development of modern industrial society, especially advanced capitalist society. Major topics for investigation include theories of industrial capitalism, the modern corporation and trade unionism. The role of the state is also highlighted.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 80 students

***SOSA 2141A or B Sociology of Work:** This class deals with work in modern society. Major topics investigated include modern work values, varieties of work relationships (e.g. white/blue collar, professionalism), work alienation, job satisfaction and issues of industrial democracy. It is a companion

course to SOSA 2140A or B but the latter though recommended is not required as a prerequisite.

Format: Lecture 3 hours

Prerequisites: SOSA 1000R, SOSA 1050R, SOSA 1000 or SOSA 1200R

Enrolment: 60 students

***SOSA 2150A or B Mass Society:** The origin of modern, post-industrial mass society. Problems associated with industrialization, cybernation, leisure, technology, and environmental degradation are examined in detail. Various attempts at solution of these problems are analyzed. The rise of the expert and of counter-cultural movements are given particular attention. Theoretical and methodological innovations for future forecasting are introduced.

Format: Lecture 3 hours

Prerequisites: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 60 students

***SOSA 2160A or B Sociology of Occupations:** Sociological views of the occupational structure, and of the constraints and influences that bear upon persons in various occupations.

Format: Lecture 3 hours

Prerequisites: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 60 students

***SOSA 2170A or B Political Sociology:** Introduces students to the major concepts and theories which inform the sociological study of politics. In addition to this general orientation, particular attention is devoted to the role of power and ideology in Western society, the interplay between economy and polity in contemporary North America, and political transformation as a social process.

Format: Lecture 3 hours

Prerequisites: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 60 students

***SOSA 2180R Criminology:** Crime as a form of social deviance. The significance of official crime rates is analyzed, and the various forms of criminal structure and behaviour are examined. The second part of the class deals primarily with societal response to offenders, tracing the judicial and correctional processes in Canada.

Format: Lecture 3 hours

Prerequisites: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 150 students

***SOSA 2190R Comparative Perspectives on Gender:** Applying theoretical perspectives drawn from anthropology and sociology, this class considers the underlying conditions for and consequences of gender inequalities in different historical & cultural contexts. The

class begins with an overview of the study of gender relations in anthropology and sociology. Other themes around which the class will be organized include: gender, culture and difference; gender, sexuality and reproduction; gendered labour; gender in the global political economy; and gender politics, power relations and political discourse.

Format: Lecture 3 hours

Prerequisites: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Cross-listing: Women's Studies 2800R

Enrolment: 60 students

***SOSA 2200R Sociology of the Family:** Family in one form or another is an aspect of all societies. It is the most important agent of early socialization and personality formation. The first term is devoted to a consideration of some of the cross-societal characteristics of the family in general, and of the extended family as found in traditional societies in particular. The second term is devoted to a consideration of family characteristics in urban-industrial societies, concentrating on the nuclear family with particular reference to the Canadian scene. An attempt is made to understand the processes by which family structures and functions have changed through time as societies evolved from a traditional to an urban-industrial social organization.

Format: Lecture 3 hours

Prerequisites: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 60 students

***SOSA 2220A or B Social Psychology:** Groups influence individuals and individuals react (resist, adapt to, cooperate with, or use to their own advantage) to these influences. The processes involved in such person-group relationships are explored in a number of different settings, such as the family, mental hospitals, and universities. The class will focus on both a critical review of actual studies done and on social-psychological interpretations or theories of these findings.

Format: Lecture 3 hours

Prerequisites: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 60 students

SOSA 2240A or B Introduction to Sociological Theory: An introduction to some of the major approaches taken by sociologists to understand the nature of society. The early foundations of social thought are surveyed with emphasis on the emergence of sociology as a discipline in the nineteenth century. The contributions of prominent theorists - Durkheim, Marx, Mead, Spencer, and Weber - are stressed. The most important sources of virtually all the varieties of sociological theories of the twentieth century are found in these thinkers. Specific contemporary

approaches to be considered include functionalism, conflict theory, social action theory (including symbolic interactionism and ethnomethodology), and exchange theories.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R,

SOSA 1100R or SOSA 1200R

Enrolment: 80 students

***SOSA 2250A or B Introduction to Social Anthropological Theory:** The foundations and development of social anthropology. The growth of theory in social anthropology is stressed, with special attention paid to major schools of thought and the work of prominent individuals within those schools, including Cultural Evolution; Historical Particularism; Functionalism; Culture and Personality; Structuralism; Symbolism; Cultural Materialism; and the directions in which contemporary social anthropology points. Special efforts are made to expose students to the original writings of prominent anthropologists.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 80 students

***SOSA 2290A or B Belief Systems:** The study of non-Western belief systems. Emphasis is on the religion of small-scale societies, treated from the perspective of religion as a system of symbols giving meaning to the universe and one's place in it. Topics include religion as a biological phenomenon, the nature of ritual, religion and healing, religion and altered states of consciousness, sorcery and witchcraft, and religion and culture change.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 80 students

***SOSA 2300R Introduction to Social Problems:** The study of social problems uses sociological theory and research to examine the social dynamics and consequences of a variety of contemporary issues. Though the class content will vary year by year, students can expect to deal with social problems such as poverty, drug abuse, gender and race relations, work and alienation, and environmental issues.

Format: lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R, or SOSA 1200R

Enrolment: 150

***SOSA 2350A or B Native Peoples of Canada:** A survey of the cultures of the peoples who inhabited Canada at the time Europeans came to this continent. Following a review of prehistory, the class uses an ecological perspective to examine the geographic culture areas and representative

tribes in them. As time permits, information on ethnohistory and the situation of contemporary native peoples is incorporated. This class should be taken with SOSA 2360A or B to gain an overall ethnographic knowledge of North America.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R, or written permission of the instructor.

Enrolment: 80 students

***SOSA 2360A or B Native Peoples of the United States:** A survey of the cultures of the peoples who inhabited the area that is now the United States at the time Europeans came to this continent. Following a review of prehistory, the class uses an ecological perspective to examine the geographic culture areas and representative tribes in them. As time permits, information on ethnohistory and the situation of contemporary native peoples is incorporated. To gain an overall ethnographic knowledge of North America, this class should be taken with SOSA 2350A or B.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R, or written permission of the instructor.

Enrolment: 80 students

***SOSA 2370A or B Peoples and Cultures of the World I:** Each year, the Peoples class surveys the peoples of a specific geographic area. The class includes background material on geography, climate, and history. Its focus is on the people themselves, their social organization and political, economic and kinship systems; and their problems of modernization and development. Consult the department to find which regions are to be offered in a particular year.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 80 students

***SOSA 2380A or B Peoples and Cultures of the World II:** See class description above.

Format: Lecture 3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 80 students

***SOSA 2390R Social Anthropology of the Middle East:** We know the Middle East as the cradle of civilization, the scene of the Crusades, and the focal point for a variety of international tensions. But beyond history book and newspaper are real people with their own modes of social organization, values, ways of thinking and making a living, and their own valued resources. If Western nations, including Canada, are to deal

effectively with this increasingly important region, their people must come to understand the values and aspirations of the people of the Middle East. In this class we touch upon some of the common trends and diversities which characterize the region from Iran and Afghanistan to Morocco: geography and population; ethnic groups and languages; religion; social organization; modes of subsistence; values; and the impact of the West.

Format: Lecture 3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Enrolment: 60 students

***SOSA 2400R Medicine and Health Across Cultures:** Every culture has its own concepts of health and nutrition, its own treatments and practices. The strengths and weaknesses of our own system grow clearer when medical anthropologists compare it with that of other societies. This class's specific topics vary from year to year but always include: native theories of the etiology of illness, transcultural vs. culture-specific disease syndromes, pregnancy and childbirth in other cultures and our own; senescence and death viewed cross-culturally, the conflict between traditional medical systems and the Western physician and hospital, patients' expectations and the medical subculture, the physician as secular priest, and food and nutrition across cultures.

Format: Lecture 3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Enrolment: 60 students

***SOSA 2500A or B Sociology of Health and Illness:** An introduction to sociological analyses of health, illness, and health care. Class topics include the experience of illness, socioeconomic and cultural variations in patterns of illness, social behaviour and its effects on health, the social production of health and illness, occupational hazards, the relationship between mental and physical health, the organization of health care, hospital and community care, health care workers, inequalities in health and health care.

Format: Lecture 3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Exclusion: SOSA 2501R
Enrolment: 60 students

***SOSA 2600R Food and Nutrition Across Cultures:** Our bodies determine nutrition, our environments limit what may be available, and our cultures decide what is to be considered "food". This class joins the anthropology of food with the cross-cultural study of nutrition. Topics include definitions of the edible, nutrition and modernization,

ecology and food, food taboos, age and gender differences in food prescriptions and proscriptions, dieting and obesity, food and religion, cannibalism, the symbolic meaning of eating and food, and food shortages.

Format: Lecture 3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Enrolment: 60 students

***SOSA 2700A or B Sociology of Mediation:** Mediation is a process where a neutral third party assists two contending parties to reach an agreement. It is a rapidly growing form of conflict resolution, particularly in North America. This class will apply sociological research to the various types of mediation such as: divorce mediation, victim-offender mediation, community mediation. Mediation will be studied as a social movement, as an organizational form and as a small group process. Although this class does not teach the student how to be a mediator, it does complement non-credit programmes providing mediation training.

Format: Lecture 3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Enrolment: 60 students

***SOSA 3010R Sociology of Work Roles:** A seminar which examines development and change in work roles and the labour process. Among the topics covered are labour-management relations, job satisfaction, the quality of working life, professionalization, the working poor, and gender patterns of work. Underlying processes of power and control in the labour process, and of status and earnings attainment will be emphasized.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Enrolment: 20 students

***SOSA 3030R Social Problems and Social Policy:** This class focuses on the nature of social problems and social policy in advanced industrial societies. It adopts a social movement perspective, exploring the processes whereby agitation on behalf of undesirable but remedial social conditions leads to changes in social policy. Among the areas treated in depth are crime prevention, the quality of work life, race relations, deviance, and poverty and inequality.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Enrolment: 20 students

***SOSA 3060A or B Social Change and Development:** This class considers theories of social change and development, approaches to the analysis of rural and urban livelihoods at the micro level, and

examination of community, class, patronage and gender relations in both their economic and cultural aspects. The constructive uses of social analysis in the support and design of development initiatives are also discussed.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R and one SOSA credit at 2000-level, or International Development Studies 2000.
Enrolment: 20 students.

***SOSA 3070R Human Nature and Anthropology:** Can anthropologists explain why we feel sexual jealousy or why we tend to follow a dominant leader in times of stress? Can the evolutionary theories explaining why we have fingerprints and flat nails explain our behavioural traits? This class reviews theory and data on the evolution of human mind and culture in order to construct a theory of human nature. Its perspective and contents include much of what some have categorized as "human sociology," "Darwinian anthropology," and "Darwinian psychology." Evaluation will be based on essay exam and a term paper.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R or an introductory class in Psychology or Biology
Enrolment: 20 students

***SOSA 3080R Linguistics and Anthropology:** A seminar which examines aspects of linguistics relating to anthropology. Students learn to transcribe utterances phonetically, then to apply this knowledge as they study the relation of language and culture in both western and non-western societies. Each student does a phonetics fieldwork project and writes a sociolinguistics term paper.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Enrolment: 20 students

***SOSA 3090R Sociology of Culture:** The Sociology of Culture deals with the symbolic aspects of social activity. The class will examine major contributions to this field by intellectuals from the western industrial systems. This overview will include consideration of works by Bourdieu, Habermas, Leach, McLuhan and Williams. We will also look at the ongoing debates regarding popular culture, and the new interest in theories of postmodernity.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R and SOSA 2240A or B or SOSA 2250 A or B
Enrolment: 20 students

***SOSA 3095A or B Demographic Techniques:** This class will explore the demographic techniques used to describe the dynamics of population structure. Various demographic sources ranging from census to church records will be examined. Basic techniques for determining rates and measures of fertility, mortality, morbidity and growth as well as more advanced methods using computer programmes and simulations will be discussed. Students will be expected to complete a project using primary sources. A knowledge of logarithms and high school algebra is required.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R and SOSA 2010A
Enrolment: 20 students

***SOSA 3100A or B Feminist Perspectives in Anthropology and Sociology: Current Debates:** This class examines more recent critical debates in feminist theories. Readings map out new theoretical agendas and/or provide critical reflection on previous priorities in feminist scholarship. Relevant current issues include re-conceptualizing patriarchy; re-working dualistic models which separated wage work and domestic labour on the one hand and work and sexuality on the other; sexism, racism, class debates; rethinking kinship and reproduction; feminism, culture and political economy; post-modernism, voice and difference; impact of colonialism and imperialism, beyond women as victims; resistance; and feminist research and praxis.

Format: Seminar 2-3 hours
Prerequisite: SOSA 2190R/WOST 2800R, or permission of the instructor.
Enrolment: 20 students
Cross-listing: WOST 3805A or B

***SOSA 3110A or B Sociology of Leisure:** This class looks at the phenomenon of leisure from a sociological perspective. Emphasis is on leisure research and the application of sociological theories to the study of leisure. Topics include: the social organization of leisure; the leisure industry and the roles of the state, the mass media, culture and leisure; and leisure and disadvantaged groups, e.g., women, the elderly, the unemployed, and minority groups.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Cross-listing: Leisure Studies 3491B
Enrolment: 20 students

SOSA 3115A or B Research Methods: This class discusses the construction of theory, the formulation of research problems, research designs, measurement, methods of data collection, and analytic theory testing.

Special attention is given to the sample survey as one of the main methods of social science research. Practical experience in survey methods is provided through a class project.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R; and SOSA 2010A or B; and SOSA 2011A or B; and SOSA 3415A or B
Enrolment: 20 students

***SOSA 3118A or B Issues in Social Research:** This class focuses on various methodological issues such as causal analysis, qualitative research, measurement theory. The specific class content in a given year is available through the Department.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R; and SOSA 2010A or B; and SOSA 2011A or B
Enrolment: 20 students

***SOSA 3117A or B Formal Organizations:** This class makes a critical study, from the comparative point of view, of theoretical models for the analysis of bureaucratic organizations. Students examine the classical, structural-functionalist, and management-science approaches to organizations. The class entails a systematic survey of the sociological literature on this subject, with special concentration on organizational structure, strategy and decision-making.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Enrolment: 20 students

***SOSA 3120A or B Social Conflict:** Introduces students to the various analytical perspectives sociologists have employed to understand the patterning and consequences of conflict in society. In this regard particular attention is devoted to the functional, coercion, and Mandan theories of conflict. This class is also concerned with conflict in contemporary society, with special reference to patterns of conflict and change in Canada.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Enrolment: 20 students

***SOSA 3135A or B The Social Organization of Health Care:** The social organization of medicine and the politics of health are examined. Particular attention is paid to environmental and occupational health issues in light of technological and social change. Epidemiological patterns of morbidity and

mortality are assessed. Students are responsible for seminar presentations in areas of interest.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Enrolment: 20 students

***SOSA 3140R Sociology of Mental Disorders:** Mental disorders as both a social and sociological problem. Social factors in the definition, incidence, etiology, and treatment of mental disorders are examined. Societal views toward and responses to so-called mental illness are reviewed and analyzed from a sociological perspective. Other topics include the social role of the mental patient and the development of mental health policy in Canada. Evaluation is based primarily on essays or a term paper.

Format: Seminar 2-3 hours
Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Enrolment: 20 students

***SOSA 3145A or B Gender and Health:** The class focuses upon 3 major areas in the relationship between gender and health: (a) The relationships among gender stereotypes and food, sexuality and body image, dieting and health; (b) Reproduction and childcare including birth control, menstruation, menopause, reproductive technology, childcare and child health; (c) Health care and health care workers - an analysis of caring, both paid and unpaid. Topics include sexual inequality in health care, health policy, family relationships and health care responsibilities.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R; SOSA 2500A or B or SOSA 2501R

Cross-listing: Women's Studies 3800A or B
Enrolment: 20 students

***SOSA 3150A or B Micro-Sociology:** This class will consist of a micro-sociological examination of the human body as a socio-cultural construction. Topics include: bodily self image, cultural definitions of physical attractiveness, stigmatization, proxemic behaviour, non-verbal communications, body hygiene and pollution taboos, and cultural aspects of human reproduction and sexuality. Special attention will be paid to class, gender and ethnicity and their relationship to body politics.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Enrolment: 20 students

***SOSA 3160 A or B Dawn of Civilization:** The processes of development of civilization in the New and Old Worlds examined from

the viewpoints of current anthropological and archaeological research. The role of environment, ideology, technology, and population as causal and/or limiting factors will be examined, as well as those features which differentiate civilizations from other forms of society. Different explanations for the rise and decline of early civilizations are tested against the archaeological record.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Enrolment: 20 students

***SOSA 3170A or B Sociology of Sport and Recreation:** A survey class which views the interrelationships among sport, recreation, culture, and society from a sociological perspective. The class provides the student with a broad overview of selected sociocultural factors which help to explain the incidence, form, and regulation of sport and specified recreational elements in contemporary society.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Cross-listing: Physical Education 4490A or B
Enrolment: 20 students

***SOSA 3180A or B Issues in the Study of Society:** This seminar consists of an intensive examination of a selected substantive issue within Sociology and Anthropology. Since the specific topic or research problem which receives special treatment will differ from year to year, students are advised to consult the department prior to registration.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Enrolment: 20 students

***SOSA 3185R Issues in the Study of Native Peoples of North America:** This seminar is concerned with the historical background of the Native-European contact situation in North America and with issues arising from this background. Students will research and present reports on issues which are significant to themselves and important to native groups. Topics covered may vary from year to year, but will normally include a combination of historical issues such as culture change and acculturation among specific groups, and contemporary issues such as land claims, government policy, and social conditions of natives.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R; and SOSA 2350A or B, or SOSA 2360A or B
Exclusion: SOSA 3185A or B
Enrolment: 20 students

***SOSA 3190A or B Social Movements:** The general topic of unstructured group activity encompasses phenomena traditionally classified as collective behaviour incidents, as well as reformist and revolutionary social movements. Although there is considerable overlap, the collective behaviour literature tends to focus on relatively brief and spontaneous activities, such as panics, disasters, and crazes, while work on social movements examines relatively more organized and enduring group activities which still fall outside the realm of normal institutions. This class investigates problems emerging from both areas of concern. Emphasis is given to relevant Canadian materials.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Enrolment: 20 students

***SOSA 3205R Ethnicity, Nationalism, and Race:** This class begins with a consideration of the concepts of ethnic group and race, and proceeds to a view of ethnic group formation and change. Next, systems of ethnic stratification are surveyed. The class concludes with the study of policies concerning ethnic relations, ethnic nationalist movements, and problems of race and ethnic relations. Both Canadian and comparative data, particularly from developing countries, are included.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Enrolment: 20 students

***SOSA 3210R Continuity and Change in Rural Societies:** An examination of the ways of life of the majority of humanity. The focus is upon groups making their living from primary production (farming, fishing) or artisan production. The structures developed and strategies employed at the local level as well as in situations of subordination to more powerful institutions and groups are of particular concern. The perspective taken is comparative with cases from the western world contrasted with other areas.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R
Enrolment: 20 students

***SOSA 3220A or B Coastal Communities:** Coastal communities as a social/ecological type are examined as populations, and social structures (territorial, economic, occupational, political) as they have developed in response to particular ecological and social circumstances. Various perspectives which have been applied to coastal communities are examined with

regard to the contribution they may make to understanding the dynamics of these communities. Major (though not exclusive) emphasis is on North Atlantic communities.

Format: Seminar 2-3 hours

Prerequisites: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Cross-listing: Environmental Studies 5180B

Enrolment: 20 students

***SOSA 3230R Psychological Anthropology:**

The overlap between psychology and anthropology. Topics include: culture and personality, culture and mental health, psychiatry in other cultures, cross-cultural differences in learning, and the evolution of human psychological characteristics. The class will focus on the extensive psychological anthropology literature dealing with the people of Japan.

Format: Seminar 2 - 3 hours

Prerequisites: SOSA 1000R, SOSA 1050R; SOSA 1100R or SOSA 1200R

Exclusion: SOSA 2230R

Enrolment: 20 students

SOSA 3245A or B Women and Aging: As women grow older, the experience of aging is generally more difficult for them than for men. This class will explore the issues related to socio-economic factors that are major determinants of the well-being of aging women. Topics will include; aging as a process; menopause, violence against older women ("granny bashing"), older women and housing; self-image and sexuality; health and the aging woman; and older women and poverty.

Format: seminar 2-3 hours

Prerequisites: SOSA 1000R, 1050R, 1100R, or 1200R, or two classes in Women's Studies

Cross-listing: WOST 3810A or B, NURS 4370A or B

Enrolment: 20

***SOSA 3250A or B Sociology of Science and Ideas:**

In the attempt to understand the reciprocal interaction between science and society we stress a comparative approach, examining science in different cultural groups and different historical periods. Various modern scientific disciplines are compared in different countries, including developing and developed countries, with differing economic and political organizations. The social organization of science is investigated through the application of micro-sociological analysis (e.g. small groups and organizational sociology theory). In particular, we focus upon tensions and conflicts within the scientific community which are understandable in sociological terms. We examine innovation and change within the

scientific community, including the processes by which new fields emerge and new ideas are evaluated.

Format: Seminar 2-3 hours

Prerequisites: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 20 students

***SOSA 3275A or B Crime and Public Policy:**

This class deals with the dynamics of change in the criminal justice system that reflect three major factors namely social movements (e.g., the victims movement, the women's movement), social forces (e.g. aging, multiculturalism), and internal processes (e.g., professionalism, rationalization). The class focuses on how outside pressures modify, and are channelled by, the criminal justice system.

Format: Seminar 2-3 hours

Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 20 students

***SOSA 3280R Youth Crime:** This class deals with criminal offenses committed by young persons. Etiologies drawn from various disciplines are examined and evaluated. A secondary focus concerns the criminal justice system as it applies to young offenders.

Format: Seminar 2-3 hours

Prerequisites: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R and SOSA 2030R or SOSA 2180R

Enrolment: 20 students

***SOSA 3285R Sociology of Criminal Law:**

This class includes an examination of the philosophy and origins of criminal law, with emphasis on the Canadian experience. Current issues related to revisions to the Canadian Criminal Code and the Young Offenders Act (1982) receive major emphasis.

Format: Seminar 2-3 hours

Prerequisites: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R and SOSA 2030R, SOSA 2180R or SOSA 2300R

Enrolment: 20 students

***SOSA 3290R Corrections:** This class traces the difficulties of the penal system in Western societies, with particular reference to Canadian corrections. The effectiveness of current methods is assessed in terms of their aims and objectives. Problems of the evaluation of current practice receive major consideration. Examination of conventional and innovative programmes in community-based treatment is included.

Format: Seminar 2-3 hours

Prerequisites: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R

Enrolment: 20 students

***SOSA 3295A or B Society and the Police:** The police play an increasingly powerful role in the maintenance of social order in contemporary Canadian society. This class introduces students to sociological theory and research on: a) the role of police in social development and social control; b) the historical and political development of public policing; c) the nature and structure of police work; d) control and accountability and e) selected issues in policing such as, policing the family, minorities and the police, community based policing and police discretion.

Format: Seminar 2-3 hours
Prerequisite: SOSA1000R, SOSA1050R, SOSA 1100R or SOSA1200R & SOSA2180R or SOSA 2300R
Enrolment: 20 students

SOSA 3401A or B History of Sociological Thought: Selected theorists in the history of sociological thought.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R and SOSA 2240A or B or SOSA 2250A or B
Enrolment: 20 students

SOSA 3405A or B Contemporary Sociological Theory: A number of recent theoretical developments in sociology are critically examined. The choice of specific theoretical topics is left up to the instructor.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R and SOSA 2240A or B or SOSA 2250A or B
Enrolment: 20 students

SOSA 3415A or B Social Statistics: There are three main components to this class: (1) lectures, in which the logic of statistical inference is presented; (2) laboratories, in which computer programmes such as SPSS are utilized; and (3) analysis of sociological data. Students are required to interpret the results of the analysis in two drafts of the same paper. An appreciation of the interplay among methods, theory and statistics is emphasized. A grasp of Grade 9 algebra is assumed.

Format: Seminar 2-3 hours
Prerequisite: SOSA 1000R, SOSA 1050R, SOSA 1100R or SOSA 1200R; and SOSA 2010A or B, and SOSA 2011A or B
Enrolment: 20 students

SOSA 4000R Seminar in Social Anthropology: This seminar is designed to allow small groups of students to pursue a particular area in social anthropology for which no regular class is offered. The topics

and requirements for the class are jointly decided by the students and the professor involved.

Format: Seminar 2-3 hours
Prerequisite: Honours registration in Social Anthropology or permission of the instructor.
Enrolment: as required

SOSA 4500R Honours Seminar in Sociology: Consult the Department's Undergraduate Advisor for details of this class.

Format: Seminar 2-3 hours
Prerequisite: Honours registration in Sociology or permission of the instructor.
Enrolment: as required

SOSA 4510A or B Readings in Sociology/Social Anthropology: In a reading class the student is assigned to a member of staff for regular meetings to discuss readings in a selected area. Papers and research projects are expected.

Format: Individual instruction
Prerequisite: Honours registration in Sociology or Social Anthropology or permission of the instructor.
Enrolment: as required

SOSA 4520A or B Readings in Sociology/Social Anthropology: See class description above.

Format: Seminar 2-3 hours
Prerequisite: Honours registration in Sociology or Social Anthropology or permission of the instructor.
Enrolment: as required

SOSA 4590R Honours Seminar in Anthropology: This class carries two credits. The student writes an honours thesis under the supervision of his/her principal adviser.

Format: Seminar 2-3 hours or individual supervision
Prerequisite: Honours registration in Social Anthropology or permission of the instructor.
Enrolment: as required

The Maritime School of Social Work

Location: 6414 Coburg Road (at Oxford
Street), Halifax, N.S. B3H 3J5
Telephone: (902) 494-3760

Programme Information

Janet Denamore, Admissions Coordinator

Academic Staff

Associate Professor and Director

J. Gilroy, BA (DAL), MSW (King's), MA (Tor)

Professors

R.W. Carlson, BA, MSW (Penn) PhD (Chicago)
J.E. Cummings, BA (Dal), MSW (St FX), PhD
(Tor)
D.P. Kerans, BA (Loyola), MA (St. Louis), STL
(Innebruck), DRS (Straesbourg)
F.C. Wien, BA (Queen's), 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. Social Studies (London), BA,
MA (Dal), PhD (Boston U)
R. O'Day, BA (UBC), MA, PhD (Michigan)
D. Williams, AB (Chico), MSW (Calif
Berkeley), PhD (Brandeis)
R. Williams, BA (Acadia), MA (Tor), DEd
(OISE)

Assistant Professors

J.B. Duplessis, BA, MSW (MtA)
J.R. Harbison, BA, BSS (Dublin, Trinity
College), Grad. Dip. SW (Edinburgh), PhD
(Tor)
R. Neal, BSW (McM), MSW (Tor)
B.K. Richard, BA (MtA), MSW (Dal)
A. Sexton, BA (Honours), MSW (Dal)
W. Thomas-Bernard, BA (MSVU), MSW (Dal)

Sessional Lecturers 1992-93

J. Graveline, BSW (Calgary), MSW (Manitoba)
D. Kays, BA (St. Dunstan's), MSW (Dal)
J. Parke, BA (St. Mary's), MSW (Dal)

Sessional Faculty Field Instructors 1992-93

S. Baylis, MSW (UBC)
C. Gillette, BSW, MSW (Dal)
J. Graveline, BSW (Calgary), MSW (Manitoba)
E. Jacobson, BSW (Dal), BA (UNB), MSW
(Tor)
J.M. Pace, BSW (Dal), MSW (Wilfred Laurier)

Field Instructors 1991-92

Halifax, Charlottetown, Church Point, Sydney

Jane Andree
Nancy Beck
Deborah Bell-Henry
Eleine Boyd
Mimi Burohell
John Campbell
Myrna Carlson
Margaret Clack
Debbie Cleveland
Berry Costello
Mary Crompton
David Currie
Elizabeth Forestall
James Fryday
Paul Gallagher
Cheryl Gillett
Elizabeth Gloade
Soledad Gonzalez
Angus Grant
Carmella Hawkes-Levin
Nancy Hay
Judy Hayaashi
Shirley Hines
Peggy Jenkinson
Kathy Jennox
Joan Jones
Anne Kane
Diane Kays
Anne Keith
Robert Konopasky
Roele Kuhn
Wenda Kyle
Stephanie Langley
Margo Lett
Shella Lucas
Lydia Lucas-White
Jim MacDonald
Scott MacGillivray
Denny MacIntyre
Clarke MacKenzie
Ian MacLean
Gordon MacMaster
Bob Miles
Janet Moore
Peter Mortimer
Paul O'Hara
Elizabeth Paul
Evelyn Pollard
Corinne Popowich
Janet Rathbun
Michelle Reid
Gail Roberts
Linda Roberta
Bertilla Sempson
Gordon Steedman
Elizabeth Stoddard
Willa Stolzman
Verna Thomas
Don Totton
John Webb
Evelyn Wheeler
Marie Wiktor

Tracey Williams
Vioki Wood

Introduction

The Maritime School of Social Work was founded in 1941 to meet a need for professionally educated social workers in the Atlantic region. The School amalgamated with Dalhousie University in 1969. The undergraduate programme leading to the Bachelor of Social Work degree was introduced in the late 1970's to provide basic professional education in Social Work. General courses in the humanities and social sciences, and more specialized courses in social policy, professional values, and practice methods equip students with knowledge and skills essential to employment in a wide range of human services. Critical analysis of human behaviour and social environment provides a foundation for the development of helping skills that assist people in solving or coping more effectively with problems and also that support broader social change.

The School also offers a Master's degree programme for advanced, specialized study in Social Work, and a Continuing Education programme of thematic regional workshops.

Both the undergraduate and graduate programmes are accredited by the Canadian Association of Schools of Social Work.

Maritime School of Social Work Regulations

All students are required to observe the University and Academic Regulations as described in this calendar.

1. Grade Point Average Requirements

The grade point average system is described in the Academic Regulations. Faculty/School/College regulations relating to GPA apply to students whose initial registration in the School was in the Fall of 1990 or earlier. (Please consult calendar for the appropriate year.)

2. Grade Requirements for Social Work Courses

A student must obtain at least a C grade in each Social Work course for that course to be counted as a credit for the BSW degree. A student who earns a grade of less than C in a Social Work course but is otherwise still eligible to continue in the programme must repeat the course until a grade of at least C is attained. Social Work courses are all courses taken under BSW study which are not designated as general admission credits.

3. Requirements of Field Instruction Courses

Field Practice courses SW3020 and SW4020/ 4030R are graded on a pass/fail system. A student must obtain a passing grade in each Field Practice course in order to be eligible to proceed in the programme. Field courses are neutral in the calculation of GPA.

4. Required Withdrawal

A student who fails to meet essential GPA standards as defined in the Academic Regulations section of this calendar must withdraw from the School. As well a student who fails a repeated class (academic or field work) must normally withdraw from the School.

5. Required Withdrawal on the Grounds of Unsuitability

The MSSW acting through its BSW 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 B.S.W. Programme Committee, are requirements for continuation in the programme.

The following list of examples illustrates the criteria used to assess unsuitability in aptitude and fitness. This list should not be considered to exclude other such behaviors:

- (i) conviction of 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 behavior (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.

6. Readmission After Voluntary Withdrawal

Students who have withdrawn from the programme for one to three years and who wish to be reinstated are required to submit a new application form, to be returned with a letter to the Chairperson, BSW Committee, requesting re-entry and explaining the reasons for the interruption in their programme, and for the decision to resume their BSW degree studies.

Students who have not registered in the programme for three years or more and who wish to be reinstated are required to reapply, normally by the March 1st admission deadline date. The application and supporting documentation must be accompanied by a letter explaining the reasons for the interruption in the student's studies and the decision to resume the BSW degree programme.

Because of the relation of the BSW programme to the attainment of professional qualifications, each application is evaluated separately by the BSW Committee, and the student informed by letter of its decision. Due to the competitive nature of the enrolment process, readmission of students is not guaranteed. Curriculum requirements of reaccepted students may be adjusted effective from the date of readmission.

7. Appeals

A student wishing to appeal a decision based on School regulations, should consult with the Chairperson of the Academic Appeals Committee for advice on appeal procedures.

8. Duration of Undergraduate Study

Students must normally complete undergraduate studies within 10 years of their first registration. This rule also applies to transfer credit to be used in completing a degree (see College of Arts and Science Regulation 17).

9. Workload Regular Academic Year

Five (5) full credit classes per academic year (except in the first year where 51/2 credits are permitted) shall be regarded as constituting a normal workload for a full-time student, and may not be exceeded without written permission from the Committee on Studies of the Maritime School of Social Work. Written permission is also required if the planned workload in any term would amount to six half-credit classes (i.e. 3 full credits).

For Spring/Summer Session see Academic Regulation 4.2.

Bachelor of Social Work Degree Programme

Admission

The BSW programme requires three years of full time study. Persons with appropriate undergraduate content on entry normally may complete the programme in two full-time years. The programme is also available on a part-time basis.

Enrollment is limited to a specified number of places that are offered once a year to the best qualified candidates, selected by the admissions process. Equal consideration is given to part-time and full-time applications. Information on admissions and application procedures is contained in the Admissions Requirements - Maritime School of Social Work section, near the front of this calendar.

Students in Other Degree Programmes

Students enrolled in Dalhousie degree programmes that accept Social Work credits as electives may take non-practice BSW classes with the permission of the course instructor and the major department. (The practice classes SW 1000, 3020, 3030, 4010, and 4030 are available to BSW students only.)

Special Students "Non-Degree"

Social Work classes are not available to "non-degree" students with the exception of agency field instructors and other qualified social work professionals who are able to satisfy normal admission requirements. Permission of the BSW chairperson is also required.

Audit by Agency Field Instructors

The MSSW permits Agency Field instructors to audit social work courses. Prior permission of the instructor concerned is required. If the field instructor wishes this audit to show on a Dalhousie University transcript, he/she must abide by the University audit regulation and fee as outlined in the current Dalhousie University Undergraduate/Graduate Calendar.

Programme Objectives

The BSW programme is designed to enable students to develop a range of basic general skills and theoretical perspectives that are adaptable to a variety of social work job settings. Although a focus of study is placed on the people, the communities and the service network of the Maritime provinces, graduates are qualified to practice social work throughout Canada and elsewhere. Opportunity for the interaction of

theory with practice is provided in two supervised field placements, one early in the curriculum and one towards the end of the programme.

Students learn to integrate values, theory and practice skills through development of:

- Ability to assess their own learning needs, and to draw wider implications from their practice and life experiences.
- Understanding and appreciation of a wide range of social work roles and interventive methods.
- Understanding of both the psychological and socio-economic forces which impinge on clients' lives.
- Critical, well-founded awareness of the probable impact of various interventions on clients.
- Ability to implement, or cause to implement, a variety of interventive skills.
- Ability to judge which interventive methods are appropriate in each concrete situation.
- Ability to understand and deal with the policies and administrative structures which affect the delivery of social services.

Relationship to the MSW Programme

The BSW provides the academic prerequisites for graduate study in Social Work. Admission to the MSW programme normally necessitates that the candidate have a BSW degree followed by two years of postbaccalaureate social work experience in the area of preferred graduate study concentration.

Full-time and Part-time Studies

A full-time programme of study usually consists of either 5 credits (i.e. 30 credit hours) or 5.5 credits (33 credit hours) during the regular Fall/Winter session.

Part-time study may consist of .5 to 3 credits (i.e. 3 to 18 credit hours) during the Fall/Winter session.

Required academic courses are generally scheduled in the evenings. Daytime sections for the three Social Work practice classes are also available. Students are required to undertake two field placements during regular daytime working hours.

Curriculum Requirements

The BSW degree programme consists of 15 Social Work credits. The latter are reduced by the amount of transfer credit and/or competency credit for which the student may be eligible. Students generally fit into either a two-year or three-year BSW programme, as follows:

Two-Year or 10-Credit Programme

Entrants with a previous undergraduate degree and a cumulative average of B- or 65% are required to complete 10 Social Work credits (i.e. 60 credit hours), consisting of:

(a) Six and one-half compulsory credits as follows:

SLWK 1000R Introduction to Social Work (1 1/2 credits)

SLWK 3020R Field Instruction I (1 credit)

SLWK 3030R Foundation of Social Work Practice (1 credit)

SLWK 4010R Advanced Social Work Practice (1 credit)

SLWK 4030R Field Instruction II (2 credits); and

(b) Three and one-half *core* credits to be selected from the following in consultation with a curriculum advisor during registration week:

SLWK 3010R Perspectives on Social Welfare Policy (1 credit)

SLWK 3040R People in Society (1 credit)

SLWK 3050A or B Social History of Atlantic Canada (1/2 credit)

SLWK 3070A or B Social Service Delivery Analysis (1/2 credit)

SLWK 3080R Science and Testing of Practice (1 credit)

SLWK 3090A or B Social Statistics (1/2 credit)

SLWK 3100A or B Political Economy of Social Welfare in Canada (1/2 credit)

SLWK 3220A or B Cross-Cultural Issues and Social Work Practice (1/2 credit)

Three-Year or 15-Credit Programme

Entrants with 5 general credits averaging B- or 65% are required to complete 15 Social Work credits (i.e. 90 credit hours), consisting of:

(a) Six and one-half compulsory credits, as above;

(b) Five and one-half *core* credits, as listed above; and

(c) Three *elective* credits, as follows:

Social Work in a Special Field of Practice Elective: (1/2 credit) Usually an elective offered by the School to provide in-depth study of unmet needs and emerging social work roles in a specific field of practice.

Social Problem Electives: (1 credit or 2 x 1/2 credits) May be social work electives, or electives offered by other Departments or Schools, to provide in-depth study of contemporary social problem issues. Examples of social problem electives are: Child Welfare, Deviancy, Women's Issues.

Free Electives (1 1/2 credits or 3 x 1/2 credits). Free electives may be chosen from any subject area, including Social Work.

Sequencing of Course Credits

All students accepted into the programme are expected to commence their Social Work credits during the regular academic session which begins in September.

It is the policy of the BSW Committee that:

- (i) **SLWK 1000R** - Introduction to Social Work be completed prior to the commencement of **SLWK 4010R** - Advanced Social Work Practice, and that
- (ii) **SLWK 3020** - Field Instruction I, be completed prior to the commencement of **SLWK 4030** - Field Instruction II.

The sequencing of course work is otherwise largely dependent on each student's needs within the following guidelines:

- (i) **1000R** - Introduction to Social Work should be taken at the beginning of a student's programme,
- (ii) Students are advised to take **4010R** - Advanced Social Work Practice after **3030R** - Foundations of Social Work Practice.
- (iii) **4030R** - Field Instruction II should be taken at the end of a student's programme.

Full-time students in the two-year programme complete **SLWK 1000**, and **3030** in year 1 and **SLWK 4010** in year 2; full-time students in the three-year programme complete **SLWK 1000** in year 1, **SLWK 3030** in year 2, and **SLWK 4010** in year 3.

New Student Advising Sessions

New students are assisted in planning their classes by curriculum advisors from the School who meet with each student during the initial stage of the scheduled Fall registration sessions. Decisions about which Social Work classes will be covered by transfer credit are usually available at this time. The possible assignment of competency credits to be earned in the coming months is also discussed during this session.

Faculty Advisors

Each student is assigned a faculty advisor for ongoing consultation concerning any issues or concerns that may arise throughout the year. For students enrolled in **SLWK 4030** - Field II the faculty field instructor also serves as the faculty advisor.

Competency Credit

Credit for competency allows certain new students the opportunity to receive credit for various types of non-formal learning, provided that they are able to demonstrate its relevancy to the content of the BSW programme.

To be eligible, the student needs at least 24 consecutive months of full-time paid or unpaid employment in the human services, or equivalent, prior to acceptance. The number of competency credits for which the student may apply is limited both by the amount of transfer credit that he/she has on entry and by the type of previous work experience. A minimum of .5 credit to a maximum of 2 credits is possible. Eligibility is determined by the credit for competency coordinator.

New students must apply for competency credit no later than September 30th of the year of their first registration in the BSW programme. To be eligible, part-time students must be registered in at least one regular classroom course which commences in September, usually Introduction to Social Work. A fee equal to half the regular fee for a .5 credit class is submitted to the competency credit co-ordinator with each topic undertaken.

Competency credits successfully completed reduce the number of classes in the BSW curriculum that the student would otherwise be required to take.

Transfer Credit

Transfer credit is assessed on an individual basis according to established School policy. It is the student's responsibility to provide course outlines and other documentation required by the School for the purpose of determining eligibility for transfer credit.

Classes Offered

SLWK 1000R Introduction to Social Work: (compulsory) This class is a basic introduction to the study and practice of Social Work including an overview of the service delivery system. It is primarily a practice class with intensive laboratory-style components, which focus on the ongoing development of communication and interventive skills. An assessment of the students' learning needs and strengths is also carried out. This class is organized over two terms.

Instructors: M.L. Courtney, J. Duplessé
Format: lecture/small groups
Prerequisite: None
Enrolment: 20-25 per section

SLWK 3010R Perspectives on Social Welfare Policy: This course provides a survey of the history of social welfare in Canada, with a focus on historical debates which shed light on present-day issues; a survey of a variety of perspectives on social problems and social policy issues, with a focus on the various definitions of human needs; and an initial survey of the spectrum of social welfare

programmes available in the Maritimes. Each student will be asked to undertake an analysis of the policies informing a programme of his/her choice.

Instructor: P. Kerans
Format: Lecture/Group Discussions
Prerequisite: None
Enrolment: No limit

SLWK 3030R Foundations of Social Work

Practice: (compulsory) Topics include a review of some of the major theories of human behaviour, and application of structural/feminist theory to a set of core practice skills.

Instructors: B.K. Richard, D. Williams
Format: lectures, small and large group discussions, student presentations, role plays

Pre/Corequisite: SLWK 1000
Enrolment: No limit

SLWK 3040R People in Society: An overall theoretical perspective on the personal, organizational and societal problems facing people today is provided regarding (a) the individual, (b) society and its functioning and (c) the interplay between these two. Emphasis is on extrapolating major

conceptual elements in order to develop an integrated diagnostic scheme relevant to the wide range of situations typically encountered in social work practice and fundamental to the theoretical base required by a "generalist" social work practitioner.

Instructors: D. Williams, Staff
Format: Seminar 2 1/2 hours
Prerequisite: None
Enrolment: Not offered in 1993-94

SLWK 3050A or B Social History of Atlantic

Canada: An analysis of the peoples who settled the region, the problems they have faced and their reactions to them are presented, with a focus that gives historical perspective to contemporary social problems.

Instructors: D. Moore, D. Williams
Format: Seminar 2 1/2 hours
Prerequisite: None
Enrolment: No limit

SLWK 3070A or B Social Service Delivery

Analysis: The course develops an appreciation of the social worker's role and responsibility in planning and delivery of social services; an understanding of the ability to apply selected theoretical models of service delivery; proficiency in analyzing and influencing service delivery systems in which social workers participate; and familiarity with some of the recent service delivery innovations in various provinces of Canada.

Instructor: D. Williams, Staff
Format: Lecture/Small Groups 2 1/2 hours
Prerequisite: None
Enrolment: No limit

SLWK 3080R Science and The Testing of Practice: In the first section of this basic research course emphasis is on providing students with a knowledge of the scientific method, a conceptual understanding of the primary terminology of science and the interrelationships between theory, research and practice. In the second section the focus is the pragmatic consideration of evaluating practice.

Instructor: R. O'Day, R. Carlson
Format: Discussion/Group Projects 2 1/2 hours

Prerequisite: None
Enrolment: No limit

SLWK 3090A or B Social Statistics: This course develops an understanding of major basic statistical tools which facilitate interpretation of data derived from social work-related data bases or research. The ability to apply basic forms of analysis to the description of samples, and the ability to draw inferences from samples to populations are provided. Applications rather than mathematical derivations are examined in exploring the practical significance and limitations of statistics. Concepts explicated are: prediction, models, level of measurement, probability, inference, and quantification. Statistics developed include: measures of central location, dispersion, regression, association, confidence intervals, and selected tests of significance with emphasis on multivariate applications.

Instructor: J. Cummings
Format: Lecture 2 1/2 hours
Prerequisite: None
 Not offered in 1993-94

SLWK 3100A or B Political Economy of

Social Welfare in Canada: The structure of government and the nature of bureaucracy; the nature of federal, provincial, municipal relations; the historical development of social policy within a context of federal taxation and provincial initiatives; and aspects of parliamentary forms as related to social policy development are covered. A critical analysis of the welfare state and its functions vis-a-vis social development on the one hand, and social control and economic planning on the other, are central concerns in this course.

Instructors: R. Williams, P. Kerans
Format: Lecture/Discussions 2 1/2 hours
Prerequisite: None
Enrolment: No limit

SLWK 3220A or B Cross-Cultural Issues and

Social Work Practice: This core course provides an opportunity to: critically examine theoretical frameworks for viewing minority racial, ethnic and cultural groups in society; examine personal values as they relate to the above groups; develop skills in working

effectively with minority groups, and understand social policies as they relate to minority groups.

Instructor: J. Graveline
 Format: Seminar 2 1/2 hours
 Prerequisite: None
 Enrolment: Limited

SLWK 4010R Advanced Social Work Practice (compulsory): Social Work practice problems are critically examined from a regional, feminist-structural perspective for the purpose of developing analytical and practical skills in preparation for professional practice.

Instructor: J. Cummings, Staff
 Format: Lecture/Small Groups 2 1/2 hours
 Prerequisite: SW 1000, SW 3020, SW 3030 (recommended)
 Enrolment: 20-25 per section

Field Instruction

All part time and full time students are required to make arrangements to undertake the two field placements (SW3020 and 4030R) during regular working hours. The field component of the programme is organized and supervised by the Maritime School of Social Work faculty. There is provision for seminars, workshops and consultations in order to assist the students with testing content from academic classes. Content necessary to a specific field of practice is introduced as required, including such topics as law and social work, housing policy, and employment policy and practice.

Equipment and Insurance

All students should have access to a portable tape recorder for use with library cassettes, and for field instruction. Students may be expected to have the use of a car in order to do their field placements. Full-time students (3 credits and above) are covered for Accident Liability Insurance during Field I and Field II through payment of their Student Union Fees.

Only students paying full-time tuition may be covered by the Dalhousie Insurance plan. Part-time students may not pay the difference in Student Union fees to obtain insurance coverage. Students needing insurance will need to make private inquiries about short term coverage.

SLWK 3020R Field Instruction I (compulsory):

This initial field placement provides an opportunity for beginning social work practice under supervision of agency personnel in liaison with School faculty. The student develops beginning competencies in direct practice situations, working with individuals and small groups. Use of agency and community resources, policies and services are studied. Approximate length 200 hours.

Students must indicate their intent to register for Field I to the Field Co-ordinator by the following dates:

- October 1 for registration in January
- January 1 for registration in the spring/summer terms
- March 1 for registration in September or January of their second or subsequent year(s).

Field I should be completed early in the student's programme.

SLWK 4030 Field Instruction II (compulsory):

The major field placement offers a faculty-supervised opportunity for the development of counselling, social change and community action skills sufficient for responsible entry into practice upon graduation. The student becomes increasingly proficient in service situations requiring counselling, and can recognize the need for influencing policy, programme or process within the place of field practice in order to carry out professional responsibilities in the community.

The student must develop a proposal to be submitted to the School and to be approved by the Field Coordinator prior to beginning the practicum. The Field II proposal must be submitted by the following deadline dates:

- March 1 for registration during either term of the regular academic session (Fall/Winter)
- January 1 for registration in the Spring term

Field placements requested in the spring/summer session are dependent upon the availability of faculty and field instructors.

Students who are working in non-social work positions must make arrangements early in their programme to be able to complete their 200-hour Field I placement and their 500-hour Field II placement. The student would normally be expected to request leaves of absence from his/her regular non-social work position. A Field manual is available to aid the student in preparing for the placement, as well as outlining the expectations for satisfactory completion of the practicum.

The Field II practicum is done at or near the end of a student's programme. Minimum of 500 hours. Proposals should be sent to: Field II Coordinator, Maritime School of Social Work, Dalhousie University, Halifax, N.S. B3H 3J6.

Credits for Competency

SLWK 2500A Learning Through General Work Experience (1/2 credit)

SLWK 2510B Self Analysis and Personal Development (1/2 credit)

SLWK 2520C Specific Social Work Skills (1/2 credit)

SLWK 2530D Non-credit Structured Learning Experiences (1/2 credit)

SLWK 2540E Knowledge of Special Field of Practice (1/2 credit)

Eligible students complete A, and no more than three of B, C, D and E.

Social Work in a Special Field of Practice Electives

Two elective classes, one in each term, are offered each year from the following:

SLWK 3170A or B Feminist Counselling

SLWK 3180A or B Family Counselling

SLWK 3200A or B Law and Social Work

SLWK 3210A or B Social Work in the Medical Field

SLWK 3230A or B Women and Social Change

SLWK 3240A or B Community Work Approaches to Social Work Practice

SLWK 3250A or B Social Work in Corrections

SLWK 3260A or B Social Work in Industry

SLWK 3270A or B Social Work in Addictions

SLWK 3280A or B Social Planning: Theory and Applications

SLWK 3290A or B Counselling in Social Work Practice

SLWK 3300A or B Independent Study

SLWK 3310A or B Rural Social Work

SLWK 3320A or B Social Work and the Aging

SLWK 3340A or B Social Work with Exceptional Children

SLWK 3350A or B Social Work with Groups

SLWK 3370A or B Child Welfare

Spanish

Location: 1376 LeMarchant Street,
Halifax, N.S.
Telephone: (902) 494-2544
Fax: (902) 494-1997

Chair

J.E. Holloway (494-2544)

Undergraduate Advisor

J.E. Holloway (494-2544)

Professors

J.M. Kirk, BA (Sheff), MA (Queen's), PHD (UBC)
A. Ruiz Salvador, BA (Brandeis), AM, PHD (Harvard)

Associate Professors

J.E. Holloway, BA (No Colo), MA (Wyoming), PHD (Duke)

Lecturer

M. Jimenez BA, MA (Sorbonne), MA (New School)

Introduction

After Chinese and English, Spanish is the most widely spoken language in the world. It is the native tongue of well over 300 million people living in 22 countries.

Spanish-speaking nations are making international headlines and students of political science, economics, commerce, sociology, anthropology, literature, history, and other academic disciplines feel increasingly interested in this area of the world. Students from these departments are welcome to take our classes on Spanish and Latin American culture, civilization, history, and politics. These classes are conducted in English, the reading is in translation, and there are no prerequisites.

Knowledge of the Spanish language will be useful to all Canadians seeking careers as members of the foreign service, business, interpreters, translators, teachers, professors, critics, editors, journalists, and many others. Our beginning language class especially emphasizes conversational Spanish.

It is a widely recognized fact that some of the best novels and poetry are coming out of Latin America today, providing stimulating and challenging material for many of our literature classes.

If your tastes and abilities lie in the direction of Spanish or Latin American studies, you should consider the possibility of taking Spanish as an area of concentration in

a General Bachelor's degree programme, a Bachelor's degree with Honours in Spanish, or with Honours in Spanish and another subject combined. An undergraduate concentration in Spanish, followed by training in Management Studies, for example, could lead to a variety of possible careers in the Spanish-speaking world in international business and public service.

The Salamanca Programme at the Colegio de España

The Salamanca Programme is a special inter-disciplinary course of instruction designed to allow Dalhousie students to undertake both an intensive study of the Spanish language and classes in Hispanic culture. In order to participate, students must normally have completed Spanish 2010B with at least a standing of 'B'. The programme takes place during the fall, lasts for one term, and is offered at the Colegio de España in Salamanca, Spain. Dalhousie University will grant 2 1/2 or 3 credits to those students who successfully complete their classes in Spain. Enquiries and applications should be addressed to the Coordinator of the Programme.

Spanish Studies to be taken at the Colegio de España

SPAN 3100A Advanced Grammar (1 credit)
SPAN 3120A Spanish Art (1/2 credit)
SPAN 3140A Spanish Literature (1/2 credit)
SPAN 3180A Spanish History (1/2 credit)
SPAN 3180A Spanish Culture (1/2 credit)

Spanish Degree Programmes

Bachelor of Arts with Honours in Spanish

Classes should include:

Year I: SPAN 1020R, and four electives

Year II: SPAN 2000A, SPAN 2010B, and any four other Spanish 2000-level half classes; a class in the minor subject; and one elective

Year III: SPAN 3020A or B, SPAN 3030A or B, plus two other 3000-level half classes; a class in the minor subject, and an elective in a subject other than that of the previous year

Year IV: Six Spanish half classes to be chosen from the upper-level programme; and two electives (may be Spanish). In addition, students are required to write an Honours essay, in Spanish, supervised by a member of the Department.

Bachelor of Arts with Combined Honours in Spanish and Another Subject

Programmes may be arranged by consultation (as early as possible) with the departments concerned.

- Notes**
- The "other" classes chosen as electives in the programmes outlined above must satisfy general degree requirements.
 - Combinations of classes other than those set forth above may be chosen after consultation with the Department Chair.
 - A student may, with the permission of the Department, be admitted to a Spanish class at an advanced point because of prior knowledge of the language. Such a student, however (except as he/she may be granted transfer credits in the usual way), must normally take the same total number of classes as other students in the same programme.

Advanced Major

The BA Advanced Major 20 Credit Programme is also available in Spanish. It is comprised of 6-9 credits in Spanish beyond the first year, of which at least 3 must be beyond the 2000 level. Recommended classes are those also listed in the Spanish Honours Programme description, and students wishing to change to an Honours Programme may do so, provided the quality of their work justifies it.

Bachelor's Degree

Programme should consist of at least four full-credit upper level classes taken in the second and third year, four of which must be conducted in Spanish. Any student who wishes to deviate from these basic requirements should consult the Department Chair.

Classes Offered

Classes marked * are not offered every year. Please consult the current timetable on registration to determine if this class is offered.

SPAN 1010B Advanced Beginning Spanish: For students with some slight prior knowledge of Spanish. Students join, at mid-year, classes of SPAN 1020R already in progress.

Instructor: Staff
Format: Discussion and conversation 3 hours, lab as needed.

Prerequisite: Knowledge of Spanish to the equivalent of first half of SPAN 1020R.

Enrolment: No limit

SPAN 1020R Beginning Spanish: For students wishing to achieve proficiency in both spoken and written Spanish.

Instructor: Staff
Format: Discussion and conversation 3 hours, language lab and computer-assisted language learning techniques as needed.

Prerequisite: For students with no knowledge or only a slight knowledge of Spanish.

Enrolment: Limited to 25

***SPAN 1100A or B Spanish Civilization:** Although it may sound self-evident to Canadian students, this class deals with Spain and the Spaniards. What Spain is and who the Spaniards are, however, may not be that clear-cut for Spaniards themselves. This class is a search for Spain throughout her history (Roman, Arab, Jewish, and Christian Spain), her art, literature, four main languages, and customs. The goal is a clearer picture of one of the most perplexing components of Western Civilization.

Instructor: A. Ruiz Salvador
Format: Lecture and discussion 2 hours, conducted in English.

Prerequisite: No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

Enrolment: Limited to 60

***SPAN 1110A or B Latin American Civilization:** The aim of this class is to provide the non-specialist with a basic understanding of this complex — and fascinating — world area. The first half of the class examines the development of Latin America from pre-Columbian times to the Mexican Revolution. In the second half, by means of a careful study of selected texts, the class examines the way in which the reality of Latin America has shaped a continental cultural identity, producing one of the most dynamic, "readable" world literatures.

Instructor: J. Kirk
Format: Lecture and discussion 2 hours, conducted in English.

Prerequisite: No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

Enrolment: Limited to 60

SPAN 2000A Intermediate Spanish: This class continues the work done in SPAN 1010B or SPAN 1020R. Supplementary reading as necessary.

Instructor: Staff
Format: Discussion and conversation 3 hours, language lab as needed.

Prerequisite: Spanish 1020R, or equivalent.
Enrolment: Limited to 20

SPAN 2010B Reading and Conversation: Emphasis is on perfecting conversational skills as the reading material is discussed in class.

Instructor: Staff
Format: Discussion and conversation 3 hours

Prerequisite: Spanish 2000A, or equivalent
Enrolment: Limited to 20

***SPAN 2069A or B Central America to 1979:** Events in Central America are frequently covered in our media, causing people to believe that "the unrest" there is recent. This class seeks to examine the historical roots of the conflict from the colonial period until the 1970s. The aim of the class is to provide students with a background knowledge of this area, so that they can better understand current developments there.

Instructor: J. Kirk
Format: Lecture and discussion 2 hours, conducted in English.

Prerequisite: No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

Enrolment: Limited to 60

***SPAN 2070A or B Area Studies on Mexico and Central America:** Following an examination of the Indian heritage, and the colonial legacy of the conquistadors, the class deals principally with the contemporary period, examining the Mexican Revolution and its aftermath, Petroleum Power, the Somoza dynasty, Nicaragua under the Sandinistas, the U.S. role in the region, the human rights situation in Central America, the current El Salvador crisis, and probable developments in the region. The class is designed to provide an understanding of the contemporary reality of this volatile region, in many ways a microcosm of the crucial situation of Latin America as a whole.

Instructor: J. Kirk
Format: Lecture and discussion, 2 hours, conducted in English.

Prerequisite: No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

Enrolment: Limited to 60

***SPAN 2080A or B The History of Modern Spain:** This class focuses on four main historical periods: the Republic of 1931, the Civil War (1936-1939), General Franco's Spain (1939-1975), and the post-Franco Restoration of the Monarchy.

Instructor: A. Ruiz Salvador
Format: Lecture and discussion 2 hours, conducted in English.

Prerequisite: No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

Enrolment: Limited to 60

***SPAN 2100A or B La Civilización de España:** Recommended to students planning to join the Salamanca Programme at the Colegio de España. This class is an exploration of Spain, one of Europe's most perplexing nations, with references to its history, art, literature, languages, and customs.

Instructor: A. Ruiz Salvador
Format: Lecture and discussion 2 hours, conducted in Spanish.

Prerequisite: SPAN 1020R and SPAN 2000A or equivalent facility in the Spanish language.

Enrolment: Limited to 25

***SPAN 2109A or B Cuba from Colonial Times to 1961:** While many people are aware of the impact of the Cuban Revolution of 1959, few are aware of the kind of society that existed in Cuba beforehand. This class seeks to examine the historical roots of the country from the colonial period until the 1960's, with particular attention being paid to socio-cultural aspects. The objective is to provide students with a background knowledge of this country and its current reality.

Instructor: J. Kirk
Format: Lecture and discussion 2 hours, conducted in English.

Prerequisite: No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

Enrolment: Limited to 60

***SPAN 2110A or B The Cuban Cultural Revolution:** Cuba, the only Communist society in the Western Hemisphere, has undergone a dramatic political and economic transformation. The Revolution has also brought about changes in education, the arts, the role of women, race relations, and athletics. The class focuses on the problems and achievements of the Revolution, the peculiarities of Communism in a Caribbean society, and its effect on literature and the arts.

Instructor: J. Kirk
Format: Lecture and discussion 2 hours, conducted in English

Prerequisites: No prerequisites. Open to students in all departments.

Enrolment: Limited to 60

***SPAN 2130A or B Latin American Dictators in the Novel:** The history of Latin America since independence has been characterized by the rise to power of countless dictators. Some of the best Latin American novels

portray these almost mythical figures who to this day wield absolute power in many countries. The class examines the literature and history of this phenomenon with particular attention to the twentieth century, and attempts to discover its roots in militarism, underdevelopment, and imperialism.

Instructor: J. Kirk
Format: Lecture and discussion 2 hours, conducted in English.

Prerequisites: No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

Enrollment: Limited to 80

***SPAN 2210A or B The Novel of the Mexican Revolution: The Mexican Revolution (1910-1917) is the first people's revolution of the twentieth century. The pre-revolutionary situation, the war, and its aftermath, resulted in some of the finest Latin American novels. This class views these works against the historical and social background of contemporary Mexico.**

Instructor: J. Kirk
Format: Lecture and discussion 2 hours, conducted in English.

Prerequisites: No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

Enrollment: Limited to 80

***SPAN 2230A or B Contemporary Latin American Prose: This class samples short stories and novels of contemporary prose from throughout Latin America. Included are works by such outstanding experimental writers as Julio Cortázar, Juan Rulfo, Carlos Fuentes, Alejo Carpentier, García Márquez and José Donoso—authors whose vigorous narrative, technical innovation and synthesis of surrealism, myth, and magical realism evidence not only a "new consciousness" in Latin America, but perhaps a rejuvenation in prose art of global consequence.**

Instructor: J. Holloway
Format: Lecture and discussion 2 hours, conducted in English

Prerequisites: No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

Enrollment: Limited to 25

***SPAN 2240A or B Contemporary Latin American Prose, Part II: This class is a continuation of Spanish 2230A or B, but may be taken independently of it.**

Instructor: J. Holloway
Format: Lecture and discussion 2 hours, conducted in English.

Prerequisite: No prerequisites

Enrollment: Limited to 25

***SPAN 2500A or B Introduction to Spanish Literature: Study of illustrative works.**

Instructor: A. Rulz Salvador
Format: Lecture and discussion 2 hours, conducted in Spanish

Prerequisite: SPAN 2000A, or equivalent

Enrollment: Limited to 25

***SPAN 2510A or B Introduction to Latin American Literature: Introduction to major authors and trends in recent Latin American literature. Study of illustrative works.**

Instructor: J. Holloway
Format: Lecture and discussion 2 hours, conducted in Spanish.

Prerequisite: SPAN 2010B, or equivalent

Enrollment: Limited to 25

***SPAN 3010A or B Workshop in Advanced Oral Spanish: This class intends to build vocabulary, increase fluency and enhance the style of spoken Spanish through continued development and intensive use of oral Spanish skills.**

Instructor: Staff
Format: Lecture and discussion 3 hours, conducted in Spanish

Prerequisite: SPAN 2010B, or equivalent

Enrollment: Limited to 20

SPAN 3020A or B Translation: Exercises in translation from Spanish to English and from English to Spanish.

Instructor: Staff
Format: Lecture and discussion 3 hours

Prerequisite: SPAN 2010B, or equivalent

Enrollment: Limited to 20

SPAN 3030A or B Composition: Training towards accuracy in writing Spanish. Vocabulary-building, free composition.

Instructor: Staff
Format: Lecture and discussion 3 hours

Prerequisite: SPAN 2010B, or equivalent

Enrollment: Limited to 20

SPAN 3040A or B Radio-Español: This class integrates all of the aspects of language study (written, oral, and translation skills with conceptual and cultural comprehension) to put into practice the essence of language: communication. As a seminar group, students will receive instruction on the technical and artistic aspects of radio production, and will create in Spanish an hour long radio program of magazine format to be aired on CKDU weekly. This Spanish program will include news reports and cultural studies of the Spanish-speaking world, interviews with members of the local Spanish-speaking community, editorials, music, local news and weather, etc. Academic areas of focus include not only linguistic skills, but also independent research skills in both English and Spanish sources for the program's fixed segments.

Instructor: M. Jiménez

Format: Lecture and discussion 1 hour, radio show 1 hour
Prerequisite: Any two of SPAN 3010A or B, SPAN 3020A or B, and SPAN 3030A or B, or permission of the instructor.
Enrolment: 8

SPAN 3050R Culture and Society of the Dominican Republic: This course examines four broad aspects of culture and society in the Dominican Republic and takes place at Dalhousie as well as in Santo Domingo and other areas of the Dominican Republic. Topics include: Dominican society, politics and economics; women in development; art and popular culture; and the popular church movement. Students will be supervised by a faculty member from Dalhousie University and will be under the immediate direction of Dominican professors and professionals working in each of the four main subject areas. Classes will take place at Dalhousie and the Universidad Iberoamericana (UNIBE).

Students will reside with a Dominican family specifically chosen by the course instructors. The families will provide an invaluable opportunity for them to become acquainted with the country and its people first-hand, as well as to use and develop their Spanish in a natural setting.

Instructor: Staff
Format: Lectures and field trips
Prerequisites: Span 2000A, 2010B (or equivalent) & permission of the instructor
Enrolment: 25
Cost: Approximately \$2,600, depending upon final cost of airfare. This includes: Dalhousie's tuition fee, round-trip airfare, full room and board for four weeks, and optional extra-curricular activities.

***SPAN 3070A or B Contemporary Latin American History:** This class examines the underlying structures of Latin America through a consideration of the major political and social trends in the continent. After a brief historical overview it studies both general currents (e.g., the Church's role, militarism's growth, and U.S. influence) and specific developments, such as the Mexican and Cuban Revolutions, Chile under Allende and Pinochet, and the Sandinistas' Nicaragua. This helps the student understand the present-day reality of this important world area.

Instructor: J. Kirk
Format: Lecture and discussion 2 hours, conducted in English

Prerequisite: No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.
Enrolment: Limited to 60

SPAN 3080A or B Historia de la España Contemporánea: This class focuses on four main historical periods: the republic of 1931, the Civil War (1936-1939), General Franco's Spain (1939-1975), and the post-Franco Restoration of the Monarchy.

Instructor: A. Ruiz Salvador
Format: lecture/discussion, 2 hours, conducted in Spanish
Prerequisite: SPAN 2000A/2010B or equivalent facility in Spanish
Enrolment: 25
Exclusion: SPAN 2080A or B

***SPAN 3200A or B Cervantes:** This class examines Cervantes' philosophy of life through an analysis of his great masterpiece, *Don Quixote*. In this precursor of the modern novel, Cervantes studies human nature in all its many aspects. Life is presented as a complex and ironic interplay of idealism and disillusionment, appearance and reality, chivalrous love and worldly love. All truth is relative, but the ultimate irony is felt by the reader himself who discovers, in the end, that Don Quixote's view of the world is superior to that of all the "sensible" people who judged him to be mad.

Instructor: Staff
Format: Lecture and discussion 2 hours, conducted in English.
Prerequisite: No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.
Enrolment: Limited to 25

***SPAN 3215A or B Seminar in Spanish American Literature:** This class studies in depth, selected topics in Spanish American prose and poetry, in their cultural and aesthetic contexts. Areas of special focus include *modernismo*, *praeclonismo* and the prose of Quiroga and the Regionalist authors, as well as the more recent inheritors of these traditions; Neruda, Vallejo, Paz and novelists of the "Boom" generation.
Instructor: J. Holloway
Format: Lecture and discussion 2 hours, conducted in Spanish
Prerequisite: SPAN 2010B, or equivalent
Enrolment: Limited to 25

***SPAN 3225A or B Seminar in Modern Spanish Literature:** This class studies in depth, selected topics in Modern Spanish prose and poetry, in their cultural and aesthetic contexts. The focus of the class falls especially on such figures as Galdos,

Leopoldo Alas, and writers of the Generation of '98 such as Baroja, Unamuno, Ortega, Machado and Jiménez.

Instructor: A. Ruiz Salvador
Format: Lecture and discussion 2 hours, conducted in Spanish
Prerequisite: SPAN 2010B, or equivalent
Enrolment: Limited to 25

***SPAN 3230A or B Literature of the Spanish Civil War: A study of representative works.**

Instructor: A. Ruiz Salvador
Format: Lecture and discussion 2 hours, conducted in Spanish
Prerequisite: SPAN 2010B, or equivalent
Enrolment: Limited to 25

***SPAN 3500A or B Contemporary Spanish Literature: A study of representative works.**

Instructor: A. Ruiz Salvador
Format: Lecture and discussion 2 hours, conducted in Spanish
Prerequisite: SPAN 2010B, or equivalent
Enrolment: Limited to 25

***SPAN 3810A or B Contemporary Spanish American Literature: A study of representative works.**

Instructor: J. Holloway
Format: Lecture and discussion 2 hours, conducted in Spanish
Prerequisite: SPAN 2010B, or equivalent
Enrolment: Limited to 25

SPAN 3800A or B Seminar in Spanish Film:

This class provides students with the basic elements of cinematic language and gives them a critical overview of the Spanish film production from the 1930's to the present day. The works of directors such as L. Buñuel, Carlos Saura, Victor Erice, Mario Camus, Pedro Almodóvar, and others are previously viewed by students and discussed in class.

Instructor: M. Jiménez
Format: lecture/discussion, 2 hours, conducted in Spanish
Prerequisites: SPAN 2000A and 2010B
Enrolment: 25

SPAN 3810A or B Seminar in Latin American

Film: This class provides the student with the basic elements of cinematic language and gives them a critical overview of Latin American film production emphasizing that of Argentina, Mexico, and Cuba. Films by Leopoldo Torre-Nileson, Leonardo Favio, A. Aristarain, M.L. Bemberg, Enrillo Fernández, Paul Leduc, Tomas Gutiérrez-Alca, Humberto Solas, and others are previously viewed by the students and discussed in class.

Instructor: Maria Jiménez
Format: lecture/discussion, 2 hours, conducted in Spanish
Prerequisites: SPAN 2000A and 2010B
Enrolment: 25

***SPAN 3970A or B Directed Reading in Spanish American Literature**

***SPAN 3975C Directed Hispanic Studies**

***SPAN 3980A or B Reading class for majors**

***SPAN 3990A or B Reading class for majors**

***SPAN 4040A or B Advanced Style and Syntax:**

Instructor: Staff
Format: Lecture and discussion 2 hours
Prerequisite: SPAN 3020, or equivalent
Enrolment: Limited to 25

***SPAN 4500A or B Golden Age Theatre**

Instructor: Staff
Format: Lecture and discussion 2 hours
Prerequisite: SPAN 3020, or equivalent
Enrolment: Limited to 25

***SPAN 4510A or B Golden Age Poetry and Prose:**

Instructor: Staff
Format: Lecture and discussion 2 hours
Prerequisite: SPAN 3020, or equivalent
Enrolment: Limited to 25

SPAN 4980A or B Reading class for Honours students

***SPAN 4985C Independent Advanced Hispanic Studies**

SPAN 4990A or B Reading class for Honours students

Statistics

Location: Chase Building
 Telephone: (902) 494-2572
 FAX: (902) 494-5130

Chair of the Department
 R.P. Gupta

Director of Division
 C.A. Field (494-3339)

Faculty Advisors
 C.A. Field (Undergraduate)
 G. Gabor (Graduate)

Professors
 C.A. Field, MSc, PhD (Northwestern)
 G. Gabor, MSc PhD (Eotvos)
 R.P. Gupta, MSc (Agra), PhD (Delhi)

Associate Professors
 D. Hamilton, MA, PhD (Queens)
 K. Thompson, MSc (Manchester), PhD (Liverpool) - (Jointly with Oceanography)

Assistant Professors
 K. Bowen, PhD (Calif)
 K.E. Manchester, MSc, PhD (Tor)
 B. Smith, MSc, (Calgary), PhD (Berkeley)

Statistical Consultant
 W. Blanchard, BSc (Dal)

Please refer to the entry for the Department of Mathematics, Statistics and Computing Science in this calendar for a full listing of the members of the Department and information on other programmes offered by the Department.

Degree Programmes

Statistics is the discipline which is concerned with the organization, display and interpretation of data. By a study of the uncertainty inherent in scientific hypotheses, statistics enables us to make inferences about these hypotheses based on observations with error.

There are several honours programmes, a 20-credit advanced major and a 15-credit major programme in Statistics available to students. Any student interested in such a course of study should consult the Director of Statistics, Department of Mathematics, Statistics and Computing Science.

Honours in Statistics

The honours programme in Statistics will provide students with a comprehensive knowledge of both theoretical and applied

statistics and will enable students to move easily into challenging employment or graduate work in statistics. The following classes are normally required by students who plan to take Honours in Statistics.

Year 1: Math 1000/1010 (or Math 1500), Stats 1080*

Year 2: Math 2000 or 2500, Math 2030/2040 (or Math 2130), Stats 2080, 2050**, 2080**, C.S. 1400/1410**

Year 3: Stats 3340, 3380, 3380, 3480, 3350, Math 3090, one of 3080B, 3100B

Year 4: Stats 4080 and 4820

In addition, 2 to 6 further half classes from other Statistics courses offered.

*The requirement to take Stats 1080 may be waived for students entering the programme in their second year.

**Some students may take either C.S. 1400/1410 and/or Stats 2050, Stats 2080 in the first year of their degree program.

It is recommended that students take STATS 2300 and COMP/MATH 3170 in either second or third year of their degree program.

Honours Comprehensive Examination

Prerequisite: Successful completion of the third year Honours Statistics programme. The student will carry out an independent statistical study or act as a major statistical contributor to a research project under the supervision of a faculty member. In addition the student will participate in the Statistical Consulting service through consulting workshops.

Combined Honours

Students interested in taking honours in Statistics combined with another subject should consult the Director of Statistics through whom a suitable course of study can be arranged.

20 Credit Advanced Major in Statistics

The department is able to offer a major in the 20- credit programme. The following classes are normally required by students who plan to take advanced major in Statistics.

Year 1: Math 1000/1010 (or Math 1500), Stats 1080*

Year 2: Math 2000 or 2400, Math 2030/2040 (or Math 2130), Stats 2080, Stats 2080, Stats 2050, C.S. 1400/1410

Year 3: Stats 3340, Stats 3380, Stats 3380 or 3350, Stats 3480, and in addition 2 to 8 further half classes in Statistics in their 3rd and 4th year.

*The requirement to take Stats 1060 may be waived for students entering the programme in the second year.

Note: Some students may take Stats 2050/2080, C.S. 1400/1410 in their 1st year, of their degree programme. It is recommended that students take Stats 2300 and Math 3170 in either second or third year of their degree program.

15 Credit B.Sc. Degree in Statistics

The following programme is generally followed.

Year 1: Math 1000, Math 1010, and Stats 1060

Year 2: Stats 2080, Stats 2050, Stats 2080, Math 2030/2040

Year 3: Stats 3340, Stats 3360, Stats 3380 or 3350, Stats 3480

For the Major degree a 0.5 credit of the required four credits can be chosen from Math 2030, 2040, 2130.

Note: Some students may take Stats 2050 and/or Stats 2080 in the spring term of their 1st year if they have taken Stats 1060 in the fall term. Students are also advised to take Math 2000, Stats 2300 and C.S. 1400/1410 in their 2nd or 3rd year.

Co-Operative Education Programme

The Co-operative education programme integrates a 20-credit programme of 8 academic terms with 4 work terms of relevant industrial/laboratory employment. The work terms, each of 4 months duration, are spent in industrial, business and laboratory positions. The work experience helps students see the applicability of their training in statistics, mathematics, and computing science and helps them make intelligent career choices. Upon successful completion of the programme the University transcript indicates that the programme was a co-operative one.

Advanced Major students should complete a Co-op degree in 4 and 1/3 years; Honours Statistics students should expect to take 5 years.

Students interested in a Co-op programme in statistics or a combined programme with statistics should consult the Director of Statistics or the Director of Co-op Education in the Department of Mathematics, Statistics and Computing Science, preferably early in their course of study.

More details on the Co-op programme appear under the co-op entry on page 169.

Classes Offered

Credit may not be obtained twice for the same class even if the numbers have been changed.

STAT 1060A or B Introductory Statistics for Science and Health Sciences: This course gives an introduction to the basic concepts of statistics through extensive use of real-life examples drawn from a variety of disciplines. The first part of the course is about designing experiments properly and then describing and summarizing the results of the studies by using descriptive statistics. From there we move to analyzing relationships between variables. In the final part of the course, we develop the basics of statistical inference explaining how to make valid generalizations from samples to populations. Both estimation and hypothesis testing are carried out for one and two sample problems for both means and proportions as well as for simple linear regression. Students will learn to use the statistical package MINITAB. Natural sequels for this class are Statistics 2050, 2060 and 2080.

Format: Lecture 3 hours, tutorial 1 hour, MLC

Prerequisite: Nova Scotia Mathematics 442 or equivalent

Cross-listing: Same as MATH 1060

STAT 2050A or B Exploratory Data Analysis: This course is designed to introduce the student to exploratory data analysis and graphical techniques making extensive use of statistical software such as S or S-plus. Data sets from both experimental and observational studies will be used extensively and the emphasis will be on finding patterns and structure in the data. The student completing the class will be able to do sophisticated graphing, data reduction and data handling. The skills learned will be very useful in several of the advanced statistics classes.

Format: Lecture 3 hours

Prerequisite: Statistics 1060

STAT 2060A or B Introduction to Probability and Statistics: Rigorous introduction to probability and statistical theory. Subject matter is developed systematically beginning with the fundamentals of probability and following with statistical estimation and testing. The interrelationship between probability theory, mathematical statistics and data analysis will be emphasized. Topics covered include elementary probability, random variables, distributions, estimation and hypothesis testing. Estimation and testing are introduced using maximum likelihood and the generalized likelihood ratio. Natural sequels for this class are Statistics 2080 and 3360

Format: Lecture 3 hours, MLC
Prerequisite: MATH 1000/1010 or 1500
Cross-listing: MATH 2080, ECO 2080

STAT 2080A or B Statistical Methods for Data Analysis and Inference: This class introduces a number of techniques for data analysis and inference commonly used in the experimental sciences. The class begins with an introduction to model building in linear models and develops the techniques required for multiple regression. From here we consider analysis of variance, factorial designs, analysis of covariance using the general techniques for linear models. The last part of the class will include techniques for two and three way tables along with logistic regression. The use of a computer package for carrying out the computations will be an integral part of the course. Students will design and carry out a simple experiment as part of this class. A natural sequel for this class is Statistics 3340.

Format: Lecture 3 hours, MLC
Prerequisite: STATS 1080 or STATS 2080
Cross-listing: MATH 2080, ECO 2080

STAT 2090A Intermediate Statistics for Health Sciences: This class is designed so that students will be able to select appropriate statistical methods to analyse categorical, ordinal and measurement data to carry out the analysis on the computer using the MINITAB and GLIM statistical languages. Topics to be covered include least squares methods and F-test in multiple regression and analysis of variance via regression, analysis of crossed and nested designs, rank methods, analysis of count or frequency data with log linear models, power of a test.

Format: Lecture 3 hours
Prerequisite: STATS 1080 or equivalent
Cross-listing: Same as Nursing 5000, PE 5003, Pharm 5980, LEIS 5503, KINE 5503, HEED 5503, HEAS 6500

Exclusion: Intended primarily for graduate students; NOT available for credit in the Col of Arts & Sci.

STAT 2300B Introduction to Mathematical Modelling Using Algebra: For description see MATH 2300.

Format: Lecture 3 hours, MLC
Corequisite: Math 2030
Cross-listing: Same as MATH 2300B

STAT 2800A or B Theory of Interest: For description see Math 2800.

Format: Lecture 3 hours, MLC
Prerequisite: Mathematics 1010 or 1110

SCI 3000R Science Fundamentals: An interdisciplinary class that stresses the motivations, methodologies, and responsibilities of scientists, and provides extensive formal instruction in written and

oral communication of scientific material. For details, see main calendar entry "Science, Interdisciplinary." The status of this class (elective, minor, or major credit) varies from department to department; check with your undergraduate advisor.

STAT 3340A Regression and Analysis of Variance: A thorough treatment of the theory and practice of regression analysis. Topics include: fitting general linear models using matrices, optimality of least squares estimators (Gauss-Markov theorem), inferences, simple and partial correlation, analysis of residuals, case-deletion diagnostics, polynomial regression, transformations, use of indicator variables for analysis of variance and covariance problems, model selection, and an introduction to nonlinear least squares. This class makes extensive use of computer packages.

Format: lecture 3 hours
Prerequisite: STATS 2080, MATH 2030 and either MATH 1010 or STATS 2080

Cross-listing: MATH 3340

STAT 3350B Design of Experiments: The aim of the class is to develop the fundamental statistical concepts required for designing efficient experiments to answer real questions. The first main subject is unit variation and control. The basic concepts of replication, blocking and randomization are each examined. The second main subject is treatment questions and structure. The ideas of factorial designs, split-plot and incomplete plot designs are presented. We conclude with a look at response surface methodology.

Format: lecture, 3 hours
Prerequisite: STATS 3340 or consent of instructor

STAT 3360A Probability: The concepts and application of probability. Topics include the classical discrete and continuous distributions, including the binomial, hypergeometric, multinomial, Poisson, uniform, exponential and normal; definitions and properties of random variables; independence; sums of independent random variables, including the law of large numbers and central limit theorem; conditional probability; and the bivariate normal distribution. Examples will be taken from the natural and physical sciences.

Format: lecture 3 hours
Prerequisite: STAT 2080 and MATH 2000
Cross-listing: MATH 3360

STAT 3380A or B Sample Survey Methods: The development of design and analysis techniques for sample surveys. Topics include simple, stratified and systematic random sampling, ratio and regression estimation, sub-sampling with units of equal

and unequal size, double-multistage and multiphase sampling, non-sample errors and non-respondents.

Format: Lecture 3 hours
Prerequisite: STATS 2060
Cross-listing: Same as MATH 3380

***STAT 3390A or B Statistical Computing:** (same as CS 3390) The class will provide an introduction to the principal computational methods which are important for data analysis. Major analyses usually require extensive computing; hence techniques which ensure the validity and accuracy of the computations are necessary. Topics covered will include, numerical computations, linear models, Monte Carlo methods and random number generators.

Format: Lecture 3 hours
Prerequisite: STATS 2080, MATH 2040, CS 1210 or 1410

STAT 3460B Intermediate Statistical Theory: This class provides an intermediate level coverage of statistical theory to provide a framework for valid inferences from sample data. The methods developed are based on the likelihood function and are discussed from the frequentist, likelihood, and Bayesian approaches. The problems of point estimation, interval estimation and hypothesis testing and the related topics of sampling distributions, sufficiency, and Fisher information are discussed.

Format: Lectures 3 hours
Prerequisite: STATS 3360
Cross-listing: Same as MATH 3460

STAT 4060R Advanced Statistical Theory: This class is intended to provide a solid basis in estimation theory. The classical theory of estimation and testing provides a starting point. The Rao-Blackwell theory, Cramer-Rao bound, Neyman-Pearson theory and uniformly most powerful tests will be covered. From here, conditioning and invariance will be used to obtain good procedures in more complex situations. The theory will be developed in the context of specific problems including the general linear model.

Format: Lecture 3 hours
Prerequisites: STATS 3460

STAT 4070A or B Multivariate Distributions: This course deals with the distribution theory of the observations on more than one variable. Topics covered include: Multivariate Normal Distribution, The Wishart Distribution, Hotelling's T, Distributions Associated with Regression, Canonical Correlations and Discriminant Analysis.

Format: Lecture 3 hours
Prerequisite: Stats 3460

STAT 4090/5090A or B Probability: The theory of probability in Euclidean space. Topics include measure and integration,

probability measures, the definitions and properties of random variables and distribution functions, convergence concepts, Borel-Cantelli lemmas, laws of large numbers, characteristic functions and central limit theorems, conditional probability and expectation.

Format: lecture 3 hours
Prerequisite: STAT 3360 and a third year analysis class, instructor's consent
Cross-listing: MATH 4090/5090

STAT 4100A or B Survival Analysis: This course is an introduction to survival analysis methods and will cover both the statistical theory behind the methods, and the application of various techniques. Topics to be discussed include survivorship and hazard functions and their relationship to lifetime distributions and densities; modes of censoring; the Kaplan-Meier estimate of the survivor function; parametric survival time distributions; proportional hazard models and their semi-parametric estimation; accelerated life models, log rank tests, including the Mantel-Haenszel test; and goodness of fit measures.

Format: Lecture 3 hours
Prerequisite: STATS 3340 and STATS 3460, or equivalent

STAT 4200A or B Nonlinear Regression: This course is intended to familiarize the student with methods for the design and analysis of experiments using nonlinear regression models. Topics include a review of the geometry of linear regression and its extension to nonlinear regression, numerical methods for finding the least squares estimates, exact and approximate methods for confidence region construction, optimal design for precise parameter estimation, assessing influence, and insights from differential geometry such as curvature measures.

Format: Lecture 3 hours
Prerequisite: Statistics 3340 and 3460 or permission of the instructor

STAT 4350A or B Applied Multivariate Analysis: The class deals with the stochastic behaviour of several variables in systems where their interdependence is the object of analysis. Greater emphasis is placed on practical application than on mathematical refinement. Topics include classification, cluster analysis, categorized data, analysis of interdependence, structural simplification by transformation or modelling and hypothesis construction and testing.

Format: Lecture 3 hours
Prerequisite: STATS 3340 and MATH 2130 or 2040

STAT 4360A or B Robust Statistics: Robust Statistics are those which provide protection

against violation of assumptions underlying the statistical procedure. We will develop basic concepts including sensitivity, influence and breakdown of estimates and tests. Classical procedures will be evaluated in terms of robustness and alternate techniques developed based on weighted least squares and/or median based generalizations. Starting from the location problem, we will move on to regression and to multivariate problems by means of robust covariance estimates. We will also consider robust techniques in time series. Some simple programming will be required to implement various procedures.

Format: Lecture 3 hours
Prerequisite: STATS 3460 & 3340

STAT 4370/5370A or B Stochastic Processes: The theory and application of stochastic processes. Topics to be discussed include the Poisson process, renewal theory, discrete and continuous time Markov processes, and Brownian motion. Applications will be taken from the biological and physical sciences, and queueing theory.
Format: lecture 3 hours
Prerequisite: STAT 3360 or instructor's consent

STAT 4390A or B Time Series Analysis I: Time series analysis in both the time and frequency domain is introduced. The course is applied and students are required to develop their own computer programs in the analysis of time series drawn from real problems. Topics to be discussed include the nature of time series, stationarity, auto and cross covariance functions, the Box-Jenkins approach to model identification and fitting, power and cross spectra and the analysis of linear time-invariant relationships between pairs of series.
Format: Lecture 3 hours
Prerequisite: STATS 3340, 3460, or instructor's consent

STAT 4400A or B Time Series Analysis II: This course is concerned with the analysis of multivariate time series, and provides an advanced coverage of the statistical theory behind time series methods. Topics to be covered include theoretical aspects of Box-Jenkins models, Kalman filtering and the state space model, and the frequency domain approach to transfer function estimation.
Format: Lecture 3 hours
Prerequisite: STAT 4390, 4350, or instructor's consent
Cross-listing: Ocean 4080
Exclusion: Credit may be given for only one of STAT 4400 and old STAT 4080.

STAT 4410/5410A or B Advanced Topics in Time Series Analysis: This is an advanced course in the analysis of time series and

related stochastic processes. The topics will vary from year to year, and may include spatial time series, nonstationary time series, nonlinear and non-Gaussian models, fitting of dynamical systems models, ployspectra, filtering and smoothing, and the analysis of point processes data.
Format: lecture 3 hours
Prerequisite: Stat 4390

STAT 4620A or B Data Analysis: A variety of statistical models which are useful for the analysis of real data are discussed. Topics may include: generalized linear models, such as logistic regression and Poisson regression, models for multidimensional contingency tables, ordered categories and survival data.
Format: lecture 3 hours
Prerequisite: STATS 3340, 3460, or instructor's consent

- STAT 8700 Co-op Seminar**
- STAT 8891 Co-op Work Term I**
- STAT 8892 Co-op Work Term II**
- STAT 8893 Co-op Work Term III**
- STAT 8894 Co-op Work Term IV**

Theatre

Location: Dalhousie Arts Centre, 5th Floor, Halifax, N.S.
Telephone: (902) 494-2233
Fax: (902) 494-1837

Chair
 D. Overton (494-2241)

Undergraduate Advisor
 R.G. Merritt (494-2233)

Professors
 A.R. Andrews, BA, DipEd, MA (Leeds), PhD (Ill) FRSA
 P.Perina, MA, Dip. Scenography (Prague)

Associate Professors
 P. Christopher, Dip (NTSC)
 R. Doyle
 R.G. Merritt, AB (Corn), MA (NCar), PhD (Tul)
 D. Overton, BA, MA (UBC), PhD (Calif)

Lecturer
 K. Collins, AB (Dallas), MFA (Calif)

Senior Instructor
 L. Sarge, BA (King's/Dal), MA (NYU)

Production Manager
 D. Griffin

Special Instructors
 C. Badler (Acting)
 K. Edgett (Acting)
 B. MacLennan (Light and Sound)
 M. McMurray Pigot (Acting)
 D. Porter (Properties)
 R. Theriault (Costumes)
 I. Thomson (Construction)

Introduction

The Dalhousie Theatre Department offers different ways to study the theatre:

- (1) You can undertake programmes that lead to a university degree: an Honours BA (4 years), a General BA (3 years);
- (2) You can enrol in a training programme in costume studies that leads to: a Certificate (2 years), a Diploma (3 years);
- (3) You can select certain theatre classes to reinforce and complement your studies in other disciplines offered by the university;
- (4) You can enrol in one class, from a special group, as a part-time or extension student.

Basically, the degree programmes involve a curriculum of theatre classes, and a selection of other classes in different disciplines. The university has a set of

regulations which specify how these programmes must be arranged. These regulations are all listed earlier in this calendar, and prospective students should refer to them to become aware of the opportunities offered. There are a surprising number of different ways to arrange one's studies; what we recommend is the basic structure you should follow if theatre is your primary interest.

Degree Programmes

Note: Honours programmes may not be available. Interested students should contact the Undergraduate Advisor.

BA with Honours in Theatre (4 years)

Students who wish to follow a programme of theatre studies that keeps the whole of the theatre in perspective choose this programme. They must maintain a high scholastic level of performance to remain in this programme (B⁻ or better in all classes.) Only theatre classes are listed.

Year 1: THTR 1000R, THTR 1050R

Year 2: THTR 2000R, THTR 2011A or B, THTR 2012A or B, and THTR 2900R or THTR 2700R

Year 3: THTR 3500R and choice of two of THTR 3200R, THTR 3600R, THTR 2900R or THTR 3510A or B

Year 4: THTR 4900, THTR 4700R, THTR 4710R

BA with Combined Honours (4 years)

It is possible to follow a programme of studies that leads to Combined Honours in two subjects. Students interested in constructing such a programme should start by seeing both Advisors of the disciplines they wish to combine. From that point a suitable programme can be constructed.

BA in Theatre (Acting) (3 years)

The BA programme with an emphasis in acting is a degree program, and students must satisfy all the ongoing degree requirements of the University. When accepted as a result of audition you will pursue the following course of study:

Year 1: THTR 1500R, THTR 1050R, plus three classes in other subjects.

Year 2: THTR 2011A or B, THTR 2012A or B, THTR 2800R/ THTR 2810R/ THTR 2820R, plus one class in another subject.

Year 3: THTR 3800R/ THTR 3810R/ THTR 3820R and either THTR 3500R or THTR 2900R, plus one class in another subject.

The main objective of the Acting Programme is to satisfy the needs of those students who have already decided to pursue a career in Stage Acting. The programme is structured to be progressive in nature, culminating in a company of student actors who perform in the D.T.D.P. Season in their third and final year. As it is a progressive programme students move through all three years together and must, in addition to meeting degree requirements, achieve adequate grades in every acting programme course as well as be recommended by the acting faculty in order to advance to the next year's course of study. The programme provides these students with a preprofessional training programme and the benefits of a liberal education at major Canadian University.

Acceptance into the Acting Programme is highly selective and is based on the ability to meet the university's admission requirements and an evaluation of the applicant's ability/response to the audition process, and commitment to becoming a theatre professional. Auditions are held in May and June annually. A limited number of auditions may be scheduled on an individual basis if applicants are unable to attend the May and June sessions. Contact the Department of Theatre for further details.

BA in Theatre (Scenography & Technical Scenography (3 years; 4 years with Honours))

People from very different backgrounds are attracted to the study of scenography. Students with considerable art school or architecture background are offered especially tailored programmes, and should contact the scenography professor to work out a suitable programme of studies in scenography. Students starting with a keen interest and little formal background in art or architecture are admitted if they meet the university entrance requirement, and should then plan to follow the following programme:

Year 1: THTR 1000R, THTR 1050R; plus three classes in other subjects.

Year 2: THTR 2700R, THTR 2011A or B, THTR 2012A or B, THTR 2060R/ THTR 2070R; plus one class in another subject.

Year 3: THTR 3060R/ THTR 3070R; plus two of THTR 2000R, THTR 2900R, THTR 2300R, THTR 3500R, THTR 3710R, plus one class in another subject.

Year 4: THTR 4900R; plus two of THTR 3600R, THTR 3200R, THTR 4700R, THTR 4710R; plus two classes in other subjects.

Students wishing to pursue the scenography specialty are urged to make an

appointment with the scenography professor before they register to ensure they plan their specific programme in line with their particular needs.

BA with a Major in Theatre

You can major in theatre in a three-year BA programme (15 classes). This requires at least four and not more than eight theatre classes beyond the 1000-level. You may also take an advanced major after consultation with the Undergraduate Advisor.

Year 1: THTR 1000R, THTR 1050R; plus three other classes of your choice.

Year 2: THTR 2011A or B, THTR 2012A or B plus up to three of THTR 2000R, THTR 2700R, THTR 2900R; plus elective(s).

Year 3: Up to four of THTR 3200R, THTR 3500R, THTR 3510A or B, THTR 2300R, THTR 3600R, plus elective(s).

Year 4: Optional - consult the department.

Combined BA or BEd

The Theatre Department in conjunction with the School of Education may offer a 4-year programme leading to the BA and BEd degrees. The outline of this programme is approximately as follows:

Year 1: (5 Credits) THTR 1000R, THTR 1050R, an approved writing class (1 full credit), introductory class in minor area* (1 full credit), and Arts and Social Sciences elective (1 full credit).

Year 2: (5 Credits) THTR 2000R, THTR 2900R, further classes in minor area* (2 full credits), 1/2 credit class in educational foundations, 1/2 credit Arts and Science or other elective.

Year 3: (6 Credits) THTR 3200R, THTR 2011A or B, THTR 2012A or B, further classes in minor area* (2 full credits at 2000* level), two 1/2 credit classes in educational foundations, and one credit Arts and Science or other elective.

Year 4: (6 Credits) Education 4820R, one credit class in Field Experience, one credit in methods area (elementary option: 2 credits), one credit in special education, 1/2 credit class in educational foundations, further class in minor area* (1 full credit), and 1/2 credit Arts and Science or other elective.

*The minor area must also be a recognized teachable subject.

For further information, consult the Undergraduate Advisor.

Costume Studies, Certificate in 2 years, Diploma in 3 years

This professional programme is designed for the student whose goal is the professional theatre or the fashion industry. Students must meet university entrance requirements. Students in this programme do not have to take classes outside of theatre.

Students are required to work on departmental productions as a means of gaining proficiency in garment assembly. In order to maintain a harmonious student/teacher relationship only twenty-five students will be enrolled in the first year, fifteen students in the second year and five in the third year. The third year prepares the student for professional work, either in the fashion industry or in the theatre.

Facilities

The department is located in the theatre wing of the Dalhousie Arts Centre. The theatre wing is a self-sufficient unit involving one proscenium theatre, two studios, and supporting workshops.

The department is developing close collaboration in certain theatre work with the Neptune Theatre and other regional theatres.

Some theatre classes by the nature of the work involved have a restricted enrolment. All students wishing to take any class in theatre should therefore first consult with the department.

Please note: Theatre by its nature requires evening work. Students, especially in acting, scenography, and costume classes, are advised not to undertake other evening commitments.

Classes Offered

Note: Classes marked * are not offered every year. Please consult the current timetable on registration to determine if these classes are offered.

Classes in the Degree Programme

Year 1

THTR 1000R The Nature of the Theatre: This class provides an introduction to the nature of the production process and theatre through lectures, discussion, demonstration, script analysis, and practical scene work.
 Instructor: R.G. Merritt/D.R. Overton
 Format: Lecture/lab 3 hours
 Enrolment: Limited to 30 per section

***THTR 1010R Introductory Theatre:** (Summer Session only). This class provides an introduction to the nature of the theatre as a complete performing art, involving work with written scripts, improvisation, criticism,

and discussion leading to a basic understanding of the functions of theatre. It is designed to serve as an elective for the student who wishes to take a single class in theatre. It may serve as a prerequisite to advanced theatre classes in lieu of THTR 1000R.

Instructor: D.R. Overton
 Format: lecture/lab 10 hours
 Enrolment: Limited to 20

THTR 1050R Theatre Organization and Stagecraft: An introduction to theatre production, providing initial contact with scenography. Basic theatre construction, common materials used for construction, stage properties and costumes, knowledge of basic theatre lighting and sound equipment, and the methods and procedures for working with all of them efficiently, creatively and safely make up the substance of this class. Students who intend to major in the theatre programmes must take this class. It is also a prerequisite for the scenography classes. Because of the required evening production work, those enrolling in this class must avoid permanent evening commitments other than departmental theatre activity during the academic year. There are certain lab charges connected with this class.

Instructor: P.Perina and staff
 Format: lecture 2 hours, lab 4 hours
 Enrolment: Limited to 50

***THTR 1200R The Nature of Acting:** (Summer Session only). This class is designed to be a basic exploration of the fundamental techniques required by the performer. It is not intended as a substitute for THTR 1500R nor is it a prerequisite for admission to the acting programme. Through the use of theatre games (C. Barker), introductory improvisational exercises (V. Spolin), and physical awareness work (R. Benedetti), the student develops the imaginative and emotional awareness that serves as the foundation of the performers' technique.

Instructor: P.Christopher
 Format: 6 hours lecture
 Enrolment: Limited to 20

THTR 1500R An Introduction to Theatre Performance (Acting 1): The Discovery Year: The first year of the Acting Programme assists students in discovering their physical, vocal, and imaginative abilities. Emphasis is placed on developing the imagination and accessing a broad emotional range of expression through the use of theatre games, improvisation, sensory awareness exercises and basic scene work, coupled with the fundamental principles of Voice/Speech, and Dance. A strong emphasis is placed on the discipline that is the basis for a career in the professional theatre.

Instructor(s): Christopher/Collins and Acting Staff
Format: 8 hours per week
Prerequisite: Audition (Consult department secretary for details.)
Corequisite: THTR 1050R
Enrolment: Limited to 20

Year 2

THTR 2000R Theatre Performance: Designed to provide exposure to the production/performance process. Through a workshop/discussion approach, basic performance problems are considered and the student is given the chance to experiment with various solutions in a performance situation. The ability to articulate solutions both verbally and nonverbally is developed. The class may result in a public performance.
Instructor: D.R. Overton
Format: lecture/lab 6 hours
Prerequisite: THTR 1000R
Enrolment: Limited to 20

THTR 2011A or B The History of the Theatre from its Origins to the Renaissance: This class gives students an opportunity to study various aspects of the early history of theatre. Specific topics covered include the origins of theatre, the Greek theatre, the Roman theatre, the medieval theatre and the theatres of the Italian Renaissance and of Shakespeare. Although there is no formal prerequisite for the class, students should normally be in their second year of study. A background in theatre, history, and/or dramatic literature will be an advantage.
Instructor: Staff
Format: lecture 3 hours
Enrolment: Limited to 40

THTR 2012A or B The History of the Theatre from Renaissance to the Twentieth Century: This class is in a sense the sequel to Theatre 2011A or B, though that class is not a prerequisite. It aims to study the development of the theatre in Europe and North America from the Renaissance to the twentieth century. There is no prerequisite, but students should normally be in at least the second year of study. A background in history, theatre and/or dramatic literature will be an advantage.
Instructor: Staff
Format: lecture 3 hours
Enrolment: Limited to 40

***THTR 2020R Jazz Dance I: (Spring Session only).** The theories and techniques of Jazz Dance: the use of space, rhythm, dynamics, and aesthetic awareness. Emphasis is on the development of personal expression through the medium of dance. Concentration is also placed on awareness of dance terminology and vocabulary.
Instructor: K.Edgett

Format: 4 hours lab/demonstration
Enrolment: Limited to 20

THTR 2060R/2070R Technical Scenography I: This class is concerned with the progressively more complex problems of the preparation of theatre production in lighting, sound, construction, and properties. The theory behind the operation of these crafts, the advances in technology and their expense and adaptability, form part of this class. Lecture periods are concerned with Stage Management, Technical Drawing, Theatre Organization and Administration as well as other related topics. Workshop preparation in light and sound, properties, and construction is integrated with crew responsibilities in department productions. There are certain lab charges connected with this class.
Instructor: P. Perina and staff
Format: lecture/lab 6 hours
Prerequisite: THTR 1000R, THTR 1050R
Enrolment: Limited to 10

***THTR 2300R Film as Theatre (Normally Spring Session):** The class provides an overview of the development of film as both an art form and a portion of the "entertainment industry". In both its conception and initial practice, film began an offshoot of popular 19th Century theatre, borrowing both its vocabulary and its aesthetics from the older art form. Since then, film has had a major influence on the modern theatre, and the function of the class is to explore the parallels by considering the content and style of significant films from the silent era to the present. This class replaces THTR 1300R.

Instructor: R.G. Merritt
Format: lecture/lab 8 hours
Prerequisite: THTR 1000R or permission of instructor
Enrolment: Limited to 20

THTR 2700R Scenography II: Designed to give students basic visual judgement and understanding. In the first half, it follows the Bauhaus approach to graphic design but adapts it to the needs of three-dimensional theatre space. In the second half the class teaches perspective; the final project is to integrate all the previous material and apply it to simple stage composition. Throughout the year analysis and criticism of various works are encouraged. The texts followed are Gyorgy Kepes' *Language of Vision* and Johannes Ihen's *The Elements of Colour*. Students wishing to take this class should consult with the instructor.
Instructor: P. Perina
Format: lecture/lab 6 hours
Prerequisite: Permission of instructor
Enrolment: Limited to 15

THTR 2800R/ THTR 2810R/ THTR 2820R Acting II: The Transformation Year: The

second year of the Acting Programme is structured to build on the knowledge acquired in the previous year of training. Students learn how to implement the freedom they have discovered as they gain further understanding of physical, vocal, and imaginative expression. Second year students may be invited to perform in the D.T.D.P. Season, dependent upon the needs of the plays chosen and the student's readiness of the performance situation as assessed by the faculty.

Instructor(s): Christopher/Collins and Acting Staff

Format: lecture/lab 15 hours per week

Corequisite(s): THTR 2011A or B, THTR 2012A or B

Prerequisite(s): Satisfactory completion of the first year BA degree requirements including THTR 1050R. A minimum grade of "C" in THTR 1500R as well as the recommendation of the acting faculty.

THTR 2800R Acting: This class is designed to build upon the creative and imaginative work done in the first year of the Acting class. Students explore personal self awareness and physical expressiveness through the continued use of relaxation techniques, sensory exercises, theatre games. Students continue to refine the physical, vocal, imaginative and psychological skills that must be focused within the actor's process. This is achieved through the in-depth study and exploration of written play scripts, (the actor as interpreter) and the use of the full face character mask, (the actor as creator).

THTR 2810R Voice and Speech: Students continue to develop free vocal expression through kinesthetic exploration of breath control, resonance and articulation. Emphasis is placed on the development of vocal strength and non-regional speech. Classical language styles are explored with particular attention to verse playing skills and textual analysis. **Singing:** Musical ability is explored through weekly classes in singing technique.

THTR 2820R Dance/Movement: Continued work to enhance posture, fluidity and a knowledge of the fundamentals of movement.

THTR 2900R Dramaturgy: How to Read a Play: This is a beginning class in dramaturgy, involving the following: learning to read a play as a theatre performance piece rather than solely as dramatic literature; understanding the theatrical and social conventions implicit in the text of any script; finding a basis for connecting scripts from other societies to a contemporary audience. The plays studied will be taken from a wide

range of historical periods, cultures, and styles. The focus is on the play script as a performance vehicle, written not for readers, but for actors, designers, directors, etc. This class replaces THTR 2100A or B and THTR 3100A or B.

Instructor: R.G. Merritt

Format: lecture 3 hours

Prerequisite(s): THTR 1000R or permission of instructor.

Enrolment: Limited to 25

Year 3

***THTR 3020R Jazz Dance II (Spring Session only):** Intermediate studies in the principles and techniques of Jazz Dance. Students must have a solid foundation in dance technique (Modern, Ballet or Jazz).

Instructor: K.Edgett

Format: lab/demonstration 4 hours

Prerequisite(s): Admission is subject to approval of instructor. (Audition/Interview)

Enrolment: Limited to 20

THTR 3060R/ THTR 3070R Technical Scenography II: An advanced class in production technology. Students work intensively in one of the areas of: construction, properties, lights and sound, or stage management. Lecture periods are devoted to Administration, Publicity, Advanced Techniques, and other related topics. Lectures are common to all students. Each student serves as crew head for at least two departmental productions. There are certain lab charges connected with this class.

Instructor: P.Perina et al

Format: lecture/lab 6 hours

Prerequisite(s): THTR 2011A or B, THTR 2012A or B, THTR 2060R/THTR 2070R/THTR 2700

Enrolment: Limited to 10

***THTR 3200R The Director in the Theatre:** This class explores in theoretical and practical terms the various functions of the director in creating a theatrical event. Topics include the historical role of the director, conceptualizing scripts, working with dramaturges, relationships with actors, and the script development process. Laboratory exploration of practical problems related to the above topics will form an integral part of the class. This class replaces THTR 4800R.

Instructor: D.R. Overton

Format: lecture/lab 4 hours

Prerequisite(s): THTR 2000R, THTR 2900R, or permission of instructor.

Enrolment: Limited to 15

THTR 3500R The Modern Theatre: The modern theatre has been characterized by successive bursts of creative energy and experiment. This class gives an opportunity

to study these developments in detail and to examine several important theatrical theories and their application.

Instructor: A.R. Andrews

Format: seminar 2-3 hours

Prerequisite: THTR 2011A or B, THTR 2012A or B, or permission of instructor.

Enrolment: Limited to 20

THTR 3510A or B Topics in the Modern Theatre: This is a class in supervised research on specific topics in the modern theatre. It may only be taken by students registered concurrently in THTR 3500R.

Instructor: A.R. Andrews

Format: seminar 1 hour and/or individual instruction

Prerequisite: Permission of instructor

Enrolment: Limited to 10

THTR 3600R The Playwright in the Theatre: The play as a vehicle for performance rather than as a literary work. Through weekly writing exercises dealing with specific dramaturgical problems, the craft of playwriting is explored. Simultaneously, a basis for understanding the nature of dramatic forms is provided through detailed analysis of the structure and techniques of plays representing a broad spectrum of styles, genres, and historical periods. With this background, the class then writes plays (both individually and collaboratively) which are then revised, critiqued, and given a public presentation by the 2000R and 3200R classes.

Instructor: R.G. Merritt

Format: lecture/lab 4 hours

Prerequisite: THTR 2900R or permission of the instructor

Enrolment: Limited to 10

***THTR 3710R Scenography:** For theatre honours and special scenography students only. It builds on the knowledge from the previous class in the field, THTR 2700R, as far as visual knowledge is concerned, and from technical knowledge acquired in THTR 2060R/ THTR 2070R. Students concentrate on learning in more detail about three-dimensional theatrical space, its dynamics and composition. At the same time, they learn technical drawing for the theatre and the methods of executing constructionally a designed work. They are introduced to the directorial/scenographic relationship. The texts followed are John R. Walker's *Exploring Drafting: Basic Fundamentals* and Wills Wagner's *Modern Woodworking*.

Instructor: P. Perina

Format: lecture/lab 6 hours

Prerequisites: THTR 2011A or B, THTR 2012A or B, THTR 2060R/THTR 2070R, and THTR 2700R.

Enrolment: Limited to 5

THTR 3800R/ THTR 3810R/ THTR 3820R Acting III: The Interpretation and Performance Year: Having discovered and strengthened natural abilities students can now apply technique to scripts of different styles. The student learns to project and communicate with an audience. This is achieved by applying the in-class work to the D.T.D.P. Season. Students are expected to *earn* significant roles in the DALHOUSIE THEATRE DEPARTMENT PRODUCTIONS season.

Instructors: Christopher/Collins and Acting Staff

Format: lecture/lab: 15 hours per week, rehearsals week-nights and Saturdays

Prerequisites: Satisfactory completion of second-year BA degree requirements including THTR 2011A or B, THTR 2012 A or B

Co-requisites: Students must have completed and/or be enrolled in THTR 2900R or THTR 3500R

THTR 3900R Acting: The third year acting class is designed to continue the ongoing classroom work of problem solving, physical freedom, relaxation, concentration, character and textual analysis and the study of the process of action. Through the continued use of practical scene work students will apply the techniques introduced in the second year of study to scenes chosen from both modern and classical texts. By gaining an understanding of the shape of drama students are encouraged to apply these techniques to the performance work done in the D.T.D.P. season. Students will also focus on audition technique for the professional situation. One hour per week will be assigned to the practical study of the Feldenkrais Technique. (Functional Integration).

THTR 3810R Voice and Speech: Students continue to develop vocal strength while maximizing vocal range and expression. Focus is primarily on realizing individual strengths and reducing weaknesses as they practice healthy vocal technique under the pressure of a variety of performance situations, including the use of dialects. **Singing:** Weekly singing classes focus on breathing, pitch and relaxation.

THTR 3820R Dance/Movement: Students develop a dance vocabulary which addresses flexibility, alignment, strength, and balance.

***THTR 3900R Heroines and Actresses: Women in Drama and Theatre:** This class is intended to provide and opportunity for the study of theatrical events as representations of women's experience. Specific themes to be explored are: women as dramatic characters; the experience of women who attempted to pursue careers in the theatre in different countries at different times; and contemporary feminist theatre in Britain, the United States, and Canada.

Instructor: A. Andrews
Format: 2 hours

Recommended: Some background in dramatic literature and/or theatre studies is useful

Cross-listed: WOST 3900R

Year 4

***THTR 4200R (EDUC 4620R) Developmental Drama:** A class which shows anyone involved or interested in the development of children or adults how drama can be used both to guide personal development and to heighten learning ability. The class considers how best to adapt developmental drama to school situations or organized groups.

Improvisation, theatre games and dramatizations of social issues make up part of the class; various approaches to drama in education are considered. Regular practice runs through the class, and each student must develop individual practical workshops.

Instructor: TBA
Format: seminar 3 hours

THTR 4210A or B Topics in Developmental Drama: This is intended as a class supplemental to THTR 4200R, exploring in depth specific approaches to Developmental Drama. Normally, this class shall be taken concurrently with, or after the completion of THTR 4200R.

Instructor: TBA
Format: lecture/demonstration
Prerequisite: advanced standing in Theatre or Education or Instructor's consent

Co-requisite: Normally THTR 4200R

Enrolment: 15
Exclusion: None

***THTR 4700R and * THTR 4710R Special Topics:** The student explores in detail particular areas of the theatre of special interest, with the guidance of members of the faculty. Frequency and the length of meetings are decided to meet the needs of the particular topic or project under study. The class is open only to fourth-year honours theatre students.

Instructor: Faculty
Format: seminar 8 hours
Prerequisite: Permission of department
Enrolment: Limited to 10

***THTR 4800R/ THTR 4810R/ THTR 4820R Acting III:** An advanced class in exercises and scene study, as well as interview and audition techniques.

Instructors: Christopher/Collins and Acting staff

Format: seminar 18 hours
Prerequisite: THTR 3800R/THTR 3810R/THTR 3820R and either THTR 3500R.

Enrolment: Limited to 10

***THTR 4900R Dramatic Theory and Criticism, and the Aesthetics of the Theatre:** All of the arts face a profound problem in the attempt to establish criteria for evaluating creative activity. This class tackles that problem as it affects the theatre. It looks at the various hypotheses and critical strategies that have been devised hitherto, and attempts to judge their present worth. It also asks what critical values are necessary for the survival and future growth of the theatre.

Instructor: A.R. Andrews
Format: seminar 4 hours
Prerequisite: THTR 2011A or B, THTR 2012A or B and THTR 3500R
Enrolment: Limited to 10

Classes in Costume Studies

These classes make up an entire programme. They are not available for credit towards a degree, i.e. BA programmes. Students accepted for the Costume Studies programme concentrate their work solely on these classes.

Year 1

THTR 1750R Costume Studies I: A basic outline of the history of costume; a history of textiles; pattern drafting; a designer's method for the media; and practical costume construction. There are certain lab charges connected with this class. The content of THTR 1050R forms a component of THTR 1750R.

Instructors: Doyle/Sorge
Format: 4 hours daily
Enrolment: Limited to 14

Year 2

THTR 2750R Costume Studies II: This covers advanced pattern drafting; decoration techniques; millinery; costume accessories; the wearing of costume; and costume making. There are certain lab charges connected with this class. The content of THTR 2011A or B and THTR 2012A or B may be a component of this class.

Instructors: Doyle/Sorge
Format: 4 hours daily
Prerequisite: THTR 1750R, with a grade of "B" or better, and the content of THTR 1050R, and permission of the instructor.

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Enrolment: Limited to 14

Year 3

***THTR 3750R Costume Studies III:** In residence and professional theatre apprenticeship, Doyle, 30 credit hours.
Prerequisite:

The content of THTR 2011A or B and THTR 2012A or B, THTR 2750R, permission of the instructor. On the basis of outstanding performance in the first two years, five or six students are selected for the third year. During this year, these chosen students are responsible for the total production of costumes required for use within the theatre department. It is intended that during part of this year the student is placed under the supervision of the Costume Studies director to assist in bridging the gap between student projects and the profession. During this year, these students learn to direct and supervise hired staff within the specific needs of today's professional theatres. They also learn all aspects of budgeting related to costume design and manufacture for major stage productions. There are certain lab charges connected with this class.

Instructor: R. Doyle

Prerequisite: The content of THTR 2011A or B and THTR 2012A or B, THTR 2750R, permission of the instructor.

Enrolment: Limited to 5

Please note: Classes marked with asterisk (*) may not be offered on a regular basis. For details consult department.

Women's Studies

Location: Multidisciplinary Centre,
Halifax, N.S.
Telephone: (902) 494-3814
Fax: (902) 494-2178

Coordinator & Undergraduate Advisor

Ann Marloom (494-3724/3814)

Faculty

- A. Andrews (Theatre)
- J. Arnoott (Political Science)
- P. Gardiner Barber (Sociology & Social Anthropology)
- B. Bednarski (French)
- J. Crowley (History)
- D. Findlay (Sociology & Social Anthropology)
- J. Fingar (History)
- R. Gernberg (Education)
- J. Gilroy (Social Work)
- N. Jabbra (Sociology and Social Anthropology) (on leave)
- B. Keddy (Nursing/Sociology & Social Anthropology)
- T. Laidlaw (Education)
- A. Marloom (Education)
- J. Oore (French)
- J. Papart (History, Development Studies)
- S. Sha:win (Philosophy)
- M. Stone (English)
- N. Trèves (French)
- M. Turner (History, Development Studies)

Introduction

This multidisciplinary programme is designed for students who wish to focus on Women's Studies as the major concentration of their undergraduate degree. The goal of the Women's Studies programme is to demonstrate the usefulness of gender as a category of analysis. Students will develop interconnections among the fundamental questions raised by scholarship on women through a selection of classes in the humanities and social sciences. Because this major is multidisciplinary, a student will also gain a perspective on women's experiences through the examination of such issues as race, class and cultural differences, that are central to the study of gender. A critical awareness of methodology in the organization of knowledge and the framework for analysis is important throughout the body of the student's work.

Programme Structure

Women's Studies offers a BA Advanced Major and a BA Major.

BA Major

The BA degree in Women's Studies includes one required half credit class at the 1000-level (WOST 100A or B/WOST 1000A or B held at Mount Saint Vincent University) and four to eight full credit classes above the 1000-level to be selected from the list of core classes in consultation with the advisor. A minimum of one of these classes must be at or above the 3000-level and the major classes must be taken from a minimum of three disciplines. In addition, the student may choose elective classes from a list of related classes, remembering that:

- a) one class must satisfy the writing requirements
- b) at least 7 full credits shall be beyond the 1000-level
- c) some of the classes have prerequisites

A related class is one in which the topic and/or approach is pertinent to Women's Studies and in which the professor has agreed to permit the student to submit work on women-related topics.

Appropriate classes offered at Mount Saint Vincent University and Saint Mary's University may also be selected, subject to the rules and regulations of the College of Arts and Science at Dalhousie regarding transfer credits and in consultation with the Undergraduate Advisor.

BA Advanced Major

In order to satisfy the requirements for the Advanced Major degree, students must complete the required half-credit class at the 1000-level (WOST 1000A or B). At least 12 of the 20 credits must be beyond the 1000-level. A minimum of six and a maximum of nine credits beyond the 1000-level are to be in the Major, and three of them must be beyond the 2000-level.

Classes Offered

Note: Classes marked * may not be offered every year. Please consult the current timetable on registration to determine if these classes are offered.

Core Classes

WOST 100A or B Focus on Women: An interdisciplinary class presenting a variety of perspectives on the role, function and expression of women. This class is held at Mount Saint Vincent University. Students must register by a letter of permission. Consult the Secretary of the program for details.

WOST 2100A or B Introduction to Gender Socialization: Identification and analysis of problems deriving from gender socialization in

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Canada form the core of this class. Attention is concentrated on informal (out of school) socialization in creating and perpetuating the problems.

Format: Lecture, discussion, student participation

Prerequisites: None

Enrolment: Preference is given to majors in Education or Women's Studies.

Cross-listed: EDUC 4021A or B, EDUC 5241A or B

Instructor: R. Gamberg

WOST 2200R Fictions of Development:

Fictions of development are novels or short stories focusing on the crises and the conflicts involved in growing up, finding a vocation, and finding oneself. This class studies representative fictions of development ranging from 19th century classics like *Jane Eyre* to contemporary works like *The Color Purple*. Special attention will be given to the connection between psychological theories and literary depictions of human development.

Format: 2 hours lecture/discussion

Prerequisites: ENGL 1000R

Enrolment: limited to 40, preference is given to majors in Women's Studies and English

Cross-listing: ENGL 2221R

Instructor: M. Stone

***WOST 2500A or B Philosophical Issues of**

Feminism: An exploration and examination of some of the concepts, issues, and arguments underlying feminist claims and perspectives. Such topics as pornography, rape, mothering, the nature of gender, and feminism's response to racism will be considered.

Format: 2 - 3 hours lecture/discussion

Prerequisites: None

Enrolment: Limited to 60

Cross-listing: PHIL 2160A or B

Instructor: S. Sherwin, S. Campbell

***WOST 2600A or B Women in Western**

Political Thought: The role of women in political life has been vilified, praised or ignored by major thinkers. Pertinent texts will be read along with interpretations by modern feminists in order to assess why the formal political enfranchisement of women has not resulted in greater substantial equality.

Format: 2 hours lecture/discussion

Prerequisites: None

Enrolment: 60

Cross-listing: POL 2327A or B

Instructor: J. Arsoott

***WOST 2800R Comparative Perspectives on**

Gender: Applying theoretical perspectives drawn from anthropology and sociology, this class considers the underlying conditions for and consequences of gender inequalities in different historical and cultural contexts. The

class begins with an overview of the study of gender relations in anthropology and sociology. Other themes around which the class will be organized include: gender, culture and difference; gender, sexuality and reproduction; gendered labour; gender in the global political economy; and gender politics, power relations and political discourse.

Format: 3 hours

Prerequisites: SOSA

1000R/1050R/1100R/1200R or Women's Studies class

Enrolment: Limited to 50

Cross-listing: SOSA 2190R

Instructor: P. Gardiner Barber

WOST 3000A or B Directed Readings in Women's Studies: Advanced readings and research in Women's Studies on selected topics. See Coordinator about particulars.

Format: Individual reading

Prerequisites: Open only to senior students in Women's Studies

WOST 3100A or B Gender Issues in

Education: Central concerns in education include classroom practices, politics and ideology of the curriculum, family-school relations, and the transition from school to work. Recent feminist critiques have forced educators to re-examine these areas of concern. This class considers how gender analysis deconstructs and reconstructs our understanding of central economic, social and cultural issues in education.

Format: 2 hours lecture/discussion

Prerequisites: One previous class in Sociology or Women's Studies

Enrolment: Limited to 30

Cross-listing: EDUC 4022A or B

Instructor: A. Manicom

WOST 3250A or B French Women Writers through the Centuries/Les femmes écrivains: Du temps des cathédrales à celui des Editions des femmes: A chronological survey based on the study of literary texts by French Women Writers, this class will attempt to

analyze the society of the time, the way it portrayed women and their role, and the overall condition of women. Emphasis will be given each time to a special period/authors within the context of the survey. Students taking the class as a Women's Studies credit may write their essays and exams in English.

Format: 3 hours lecture/discussion

Recommended: FREN 2201A or FREN 2202B

Enrolment: Limited to 20

Cross-listing: FREN 3250A or B

Instructor: N. Trêves

***WOST 3300A or B Family and Community in North America 1600-1900:** The family in North American history from the period when the family was a model for social relations to the time when it was seen as a private refuge from society at large. Among the topics

considered are the role of the family in rural and urban communities; the demographic transition from high fertility and mortality; the construction of the family's responsibilities in economic life and education; the role of ideology in shaping sex roles and child rearing; and the relations of family and community according to ethnic group, class and economic setting.

Format: 2 hours lecture/discussion
Prerequisites: 2000-level class in Canadian or American History
Enrolment: Limited to 35
Cross-listing: HIST 3350A or B
Instructor: J. Crowley

***WOST 3305A or B Women in Capitalist Society: The North American Experience:** An examination of the impact of industrialization and urbanization on "women's sphere" in society and of the emergence of various strains of feminism in the 19th and 20th centuries.

Format: 2 hours seminar
Prerequisites: 1000- or 2000-level Canadian/North American History or Women's Studies class.

Enrolment: 25
Cross-listing: HIST 3610A or B
Instructor: J. Fingard

***WOST 3310A or B Women and Development in Africa:** This class examines the economic, political and social roles of African women from precolonial to modern times. It analyzes women not as objects, but as actors who participate in the political, economic, and social processes affecting their lives.

Format: 2 hours seminar
Prerequisites: 1000- or 2000-level History, IDS, or Women's Studies class

Enrolment: Limited to 20
Cross-listing: HIST 3461A or B, HIST 5461A or B
Instructor: J. Papart

***WOST 3330A or B Women in Socialist Societies:** Investigates the progress made towards the achievement of equal status for women in societies dedicated in principle to equality for all. Case studies will range from Cuba to China.

Format: 2 hours seminar
Prerequisites: 2000-level Arts or Social Science class

Enrolment: 20
Cross-listing: HIST 3612A or B
Instructor: M. Turner

***WOST 3500A or B Theories of Feminism:** A study of the theoretical underpinning of the major feminist theories in critical comparison, concentrating on the ideological disputes and the implications for traditional approaches to social and political thought.

Prerequisites: Two previous classes in Philosophy or Women's Studies

Enrolment: Limited to 25
Cross-listing: PHIL 3170A or B
Instructor: S. Sherwin

***WOST 3800A or B Gender and Health:** The class focuses upon three major areas in the relationship between gender and health: food, reproduction, and health care. Topics include gender stereotypes and food consumption, sexuality, dieting; birth control, childbirth, menstruation, menopause, reproduction technology; health workers, caring in the family, health policy, sexism in medicine, hospital and community care. This is a discussion class and students are responsible for class participation, and research in their selected area.

Format: 3 hours discussion
Prerequisites: SOSA 1000R/1050R/1100R/1200R or Women's Studies class

Enrolment: Limited to 20
Cross-listing: SOSA 3145A or B
Instructor: D. Findlay

***WOST 3805A or B Feminist Perspectives in Anthropology and Sociology: Current Debates:** This class examines more recent critical debates in feminist theories. Readings map out new theoretical agendas and/or provide critical reflection on previous priorities in feminist scholarship. Relevant current issues include re-conceptualizing patriarchy; re-working dualistic models which separate wage work and domestic labour on the one hand and work and sexuality on the other; sexism-racism-class debates; rethinking kinship and reproduction; feminism, culture and political economy; post-modernism, voice and difference; impacts of colonialism and imperialism; beyond women as victims; resistance; and feminist research and praxis.

Format: 2-3 hours seminar
Prerequisite: SOSA 2190R/WOST 2800R or two full Women's Studies credits or permission of the instructor

Enrolment: Limited to 20
Cross-listing: SOSA 3100A or B
Instructor: P. Gardiner Barber

***WOST 3810A or B Women and Aging:** As women grow older the experience of aging is generally more difficult for them than for men. This class will explore the issues related to socio-economic factors that are major determinants of the well-being of aging women. Topics will include: aging as a process, menopause, violence against older women ("granny bashing"), older women and

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housing, self-image and sexuality, health and the aging woman, and older women and poverty.

Format: 2-3 hours, seminar
Prerequisite: SOSA 1000R, 1060R, 1100R, or 1200, or 2 credits in Women's Studies

Cross-listing: SOSA 3245A or B, NURS 4370A or B

Enrolment: 30
Instructor: B. Keddy

***WOST 3850A or B Women and Social Change:** This class is designed to examine feminist critiques of selected social policies and services (policies such as those governing financial assistance or welfare programmes, child protection services, day care provision); evaluate the usefulness of feminist theories and methods for developing social policies and programmes which are more oriented to women; assist students in developing a critical analysis of social policy and human services from the perspective of women and feminism.

Format: 2.5 hours lecture/seminar
Prerequisite: Preference is given to students registered in Social Work and in the third year of Women's Studies

Co-requisite: Related courses in Social Work, health and social sciences, and/or Women's Studies

Enrolment: limited to 20
Cross-listing: SLWK 3230A or B
Instructor: J. Gilroy

***WOST 3855A or B Feminist Counselling:** This class examines feminist counselling theories and approaches, assesses these critically and assists students in the development of feminist frameworks for counselling.

Format: 2.5 hours lecture/seminar
Prerequisite: Preference given to students in Social Work or Women's Studies

Co-requisite: Related classes in Social Work, health and social sciences, and/or Women's Studies

Enrolment: limited to 20
Cross-listing: SLWK 3170A or B
Instructor: J. Gilroy

***WOST 3900R Heroines and Actresses: Women in Drama and Theatre:** This class is intended to provide an opportunity for the study of theatrical events as they represent women and their experiences. Specific themes to be explored are: women as dramatic characters; the experiences of women who have attempted to pursue careers in the theatre in different countries at

different times; and contemporary feminist theatre in Britain, the United States and Canada.

Format: 2 hours
Recommended: Some background in dramatic literature and/or theatre studies is useful

Cross-listing: THTR 3900R
Instructor: A. Andrews

WOST 4000A or B, WOST 4100A or B, WOST 4200R Selected Topics in Women's Studies: Advanced readings and research in Women's Studies on selected topics. See the Coordinator about particulars.

Enrolment: Open only to senior students in Women's Studies

***WOST 4250A or B Québec Women Writers/Écrivaines Québécoises:** This class will explore the condition of women as revealed in texts by Québec women writers. In any given year different writers and time periods will be covered, and a variety of genres may be included.

Format: 2 hours lecture/discussion
Recommended: FREN 2201A/2202B and at least one third-year literature class, preferably French Canadian

Enrolment: Limited to 15
Cross-listing: FREN 4904A or B
Instructors: B. Bednarek, I. Coore

WOST 4500A or B Topics in Feminist Philosophy: In this class we shall explore some of the current research in a focused area of feminist philosophy such as feminist ethics, feminist epistemology, feminist philosophy of science, or postmodern feminism.

Format: 2 hour seminar
Prerequisite: Strong background in philosophy or feminist theory (normally including at least one previous class in feminist philosophy or permission of the instructor).

Enrolment: limited to 25
Cross-listed: PHIL 4500A or B and PHIL 5500A or B
Instructor: S. Sherwin

Related Classes

These classes are subject to change; consult the programme office for offerings.

Classes Offered at Mount Saint Vincent University and Saint Mary's University

Classes offered within the Women's Studies programmes at these universities are available to Women's Studies majors at Dalhousie. Classes offered are subject to change. Please consult Women's Studies,

Mount Saint Vincent, (902) 443-4450 or
Women's Studies, Saint Mary's University
(902) 420-5400. These classes must be
taken on a letter of permission (see the
Dalhousie Women's Studies Programme
Coordinator).

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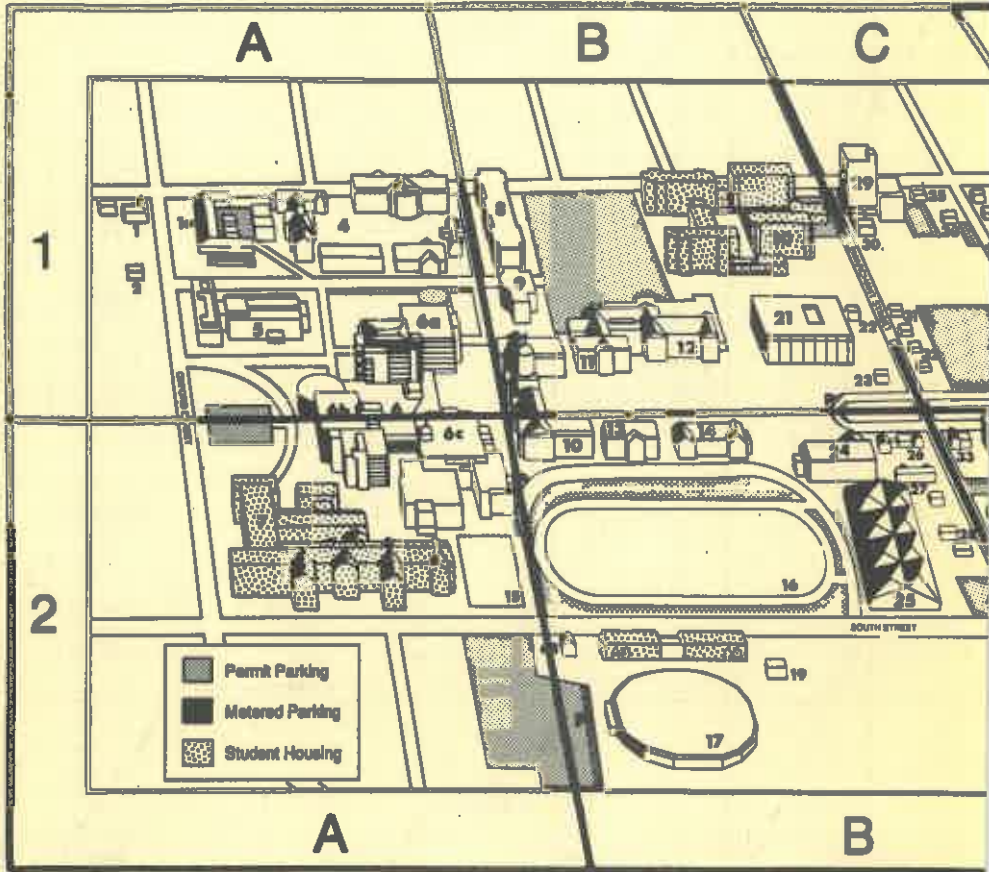
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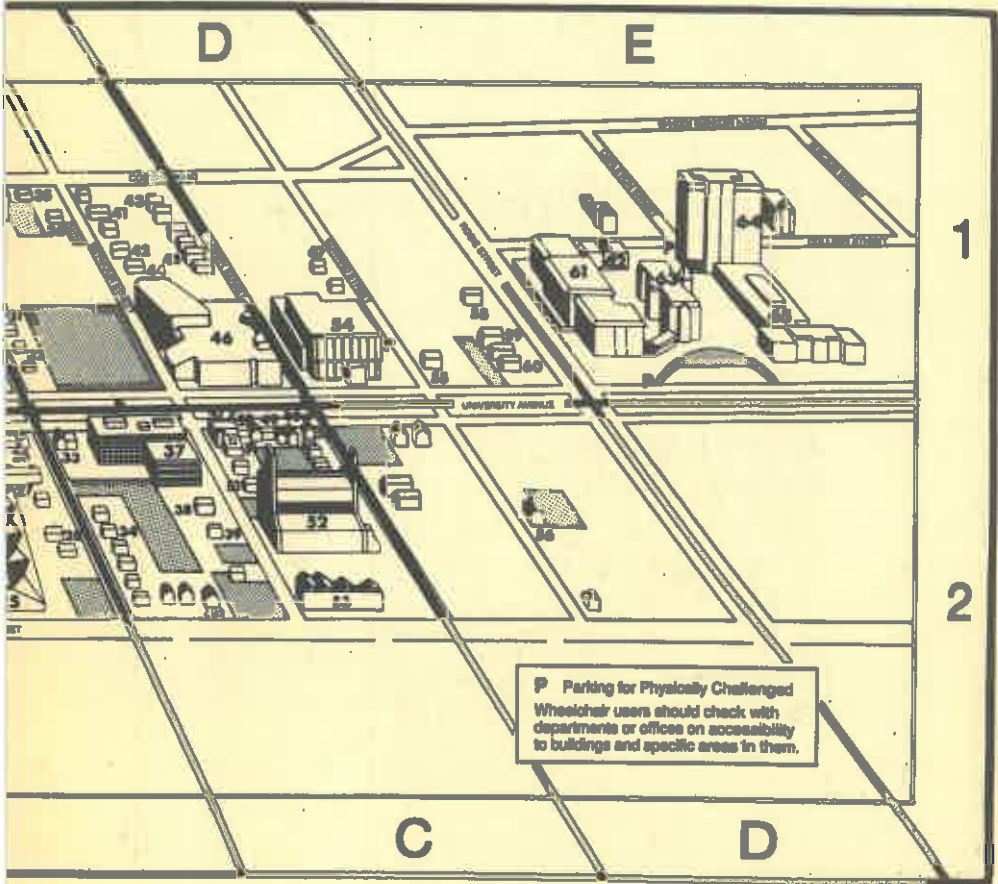
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Notes

1870-1871

[Faint, illegible handwritten notes and sketches, possibly including a diagram or map.]



For further information

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