

DALHOUSIE

U N I V E R S I T Y

1998/99

ARCHITECTURE
ARTS & SOCIAL SCIENCES
COMPUTER SCIENCE
ENGINEERING
HEALTH PROFESSIONS
MANAGEMENT
SCIENCE



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 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.

DALHOUSIE UNIVERSITY

1998/99 CALENDAR

ARCHITECTURE
ARTS AND SOCIAL SCIENCES
COMPUTER SCIENCE
ENGINEERING
HEALTH PROFESSIONS
MANAGEMENT
SCIENCE

A
Tradition
of Excellence



DALHOUSIE UNIVERSITY

1957-58 Catalogue

Faculty of
Arts and Social Sciences
Faculty of Business
Faculty of Education
Faculty of Health Sciences
Faculty of Management
Faculty of Law

London
W. F. G. Books



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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.

Transfer Student

A transfer student is one who is awarded credit towards a Dalhousie degree for academic work completed at a previous university or equivalent institution of higher learning.

Undergraduates

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

University Explorers

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.

Work Term

Career related work experience required in Co-operative Education programmes. Work terms are usually of 13-16 weeks duration.

Writing Intensive

Writing Intensive classes are those which emphasize the process of writing, frequency of writing assignments, and weighting of those assignments in the class grades. A Writing Intensive class is normally taken as a sequel to a Writing Requirement class, but does not satisfy the Writing Requirement.

Class Codes

Numbers

1000-level classes are introductory

2000-4000 level classes are advanced

5000-9000 level are Graduate level (with some exceptions)

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

Credit Hour Extension - examples only

0.05 credit hours = 1 full credit

0.03 credit hours = 1/2 credit

0.00 credit hours = no credit

Subject Codes

Four letter codes are used to describe the department offering a particular class as follows:

ANAT - Anatomy & Neurobiology

ARCH - Architecture

ASSC - Arts and Social Sciences Interdisciplinary

BIOC - Biochemistry

BIOE - Biological Engineering

BIOL - Biology

BUSI - Business Administration

CANA - Canadian Studies

CHEE - Chemical Engineering

CH&E - Community Health & Epidemiology

CHEM - Chemistry

CIVL - Civil Engineering

CLAS - Classics

COMM - Commerce

COMR - Comparative Religion

CPST - Technical Communications

CSCI - Computer Science

CTMP - Contemporary Studies

DEHY - Dental Hygiene

DENT - Dentistry

ERTH - Earth Sciences

ECED - Electrical and Computer Engineering

ECON - Economics

EDUC - Education

ENGI - Engineering

ENGL - English

ENGM - Engineering Math

ENVI - Environmental Studies

FREN - French

GERM - German

HAHP - Health and Human Performance

HEAS - Health Services Administration

HEED - Health Education

HLTH - Health Professions, Interdisciplinary

HIIST - History

HUCD - Human Communication Disorders

IDIS - Environmental Engineering

IENG - Industrial Engineering

INTD - International Development Studies

KINE - Kinesiology

KING - King's

LAWS - Law

LEIS - Leisure Studies

MARA - Marine Affairs

MATH - Mathematics

MECH - Mechanical Engineering

MEDI - Medicine

METL - Mining and Metallurgical Engineering

MICR - Microbiology & Immunology

MUSC - Music

NESC - Neuroscience

NURS - Nursing

OCCU - Occupational Therapy

OCEA - Oceanography

PATH - Pathology

PHAC - Pharmacology

PHAR - Pharmacy

PHIL - Philosophy

PHSE - Physical Education

PHYC - Physics

PHYL - Physiology

PHYT - Physiotherapy

POLI - Political Science

PSYO - Psychology

PUAD - Public Administration

RECR - Recreation

RUSS - Russian Studies

SCIE - Science, Interdisciplinary

SOSA - Sociology and Social Anthropology

SLWK - Social Work

SPAN - Spanish

STAT - Statistics

THEA - Theatre

TYPR - Transition Year Programme

WOST - Women's Studies

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 Programme

A distinct group of classes and other requirements which lead to eligibility for a degree or other university-awarded credential.

Academic sessions

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

Advanced Standing

Students possessing advanced knowledge of a subject will be encouraged to begin their studies at a level appropriate to their knowledge, as determined by the department concerned. Unlike transfer credit, such students will still be required to complete the full number of credits required for the particular credential being sought.

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.

Clerkship

See Internship

Clinical Practice

See Internship

Co-operative Education

A programme where academic study is combined with career related work experience.

Co-requisite

Requirement which must be fulfilled 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.

Externship

See Internship

Fieldwork

See Internship

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 GPA are 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.
- Sessional GPA: Classes taken in a single session.
- Cumulative GPA: All classes taken while registered in a programme.

Internship, Fieldwork, Clinical practice, Externship, Practicum, Clerkship

These terms are used in Faculty of Health Professions' programmes to describe practical professional educational experiences that are conducted in a non-university setting such as a health or social service agency.

Letter of Permission

A Letter of Permission authorizes a Dalhousie student to take a class(es) at another institution for credit towards a Dalhousie qualification. Such permission must be obtained in advance of taking the class(es).

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.

Practicum

See Internship

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.

January (cont'd)

- 18 Last day to register without late fee, second term (4th Year Pharmacy students will be granted one week following the completion of Clerkship)
Payment of second term fees due
Last day to cancel registration in or to add B classes, (except fourth year, Occupational Therapy)
- 29 Last day for partial refund of regular session fees
Last day for partial refund, second term
Second installment of regular session fees due

February

- 1 Last day to withdraw from B classes without a 'W' (except fourth year, Occupational Therapy)
Last day to change B classes from credit to audit and vice versa
Last day for partial refund if registered in regular session and second term fees
Last day to withdraw from R classes
- 5 Munro Day - University closed
- 22 Study break begins

March

- 1 Classes resume
- 8 Last day to withdraw from B classes (except fourth year, Occupational Therapy)
Last day to drop 4th year Occupational Therapy B classes without a 'W'
- 9 Last day to add B classes, 4th year, Occupational Therapy

April

- 2 Good Friday - University closed
- 9 Classes end, Regular session
- 14 Examinations begin, Regular session
- 28 Examinations end, Regular session

May

- 3 Intra-Session clinical practica begin, School of Nursing
- 17 Victoria Day - University Closed
- 18-23 Spring Convocations

Admission Dates

Final Dates for Receipt of Applications for Admission

Regular Session

College of Arts & Science, Faculties of Engineering, Computer Science and Management

Foreign Students (except USA) April 1
Students entering from Canada or USA¹ June 1
Returning Dalhousie/DalTech Students² August 15

Faculty of Architecture³ June 1
Foreign Students (except USA) April 1

Health Professions

Pharmacy February 1
Occupational Therapy, Physiotherapy,
Social Work March 1
BSc (Nursing), BSc (Recreation)⁴
BSc (Kinesiology), and Health Education⁵ June 1
BSc (Nursing) for Post RN⁵ August 1

Internal Transfers³

Fall term September 25

Dentistry⁴

DDS December 1
Dental Hygiene February 1
Dentistry Qualifying Programme December 15

Medicine⁴

MD November 15
Post-Graduate December 1

Law⁴ March 1

Winter Term

BA and BSc programmes only November 15
BSc (Nursing) for Post RN only November 15
Returning Dalhousie Students^{1,2,5} November 15

1 Late applications may be considered up to August 1 but we cannot guarantee space in programmes.

2 Those wishing early admission should apply by March 1. Late applications may be considered up to August 1, space pending.

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

4 Information on these programmes is included in the appropriate calendar.

5 For students returning to BA, BSc, BEng, BCSc, BScN programmes, or attending as Special Students in any faculty

NOTE: In order to be considered for entrance scholarships, applications for admission from high school students must be received by April 1.

Academic Dates

1998-99

Classes offered at Dalhousie have one of the letters A, B 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 classes are given throughout the entire session.

1998

April

- 27 All DalTech Classes Begin, Summer session
Last Day to Register Without Late Fee for DalTech Summer session

May

- 3 Intra-session clinical practica begin, School of Nursing
- 4 Classes begin, Commerce Co-op Summer session
Level I field work (second year, 6 weeks) and Level II fieldwork (third year, 8 weeks) begins, School of Occupational Therapy
- 6 Last day to register without late fee, Spring & Co-op Summer sessions
- 11 Classes begin, Spring session
Outpost Nursing internship begins
- 15 Last day to cancel registration in or to add A and R classes, Spring session.
Last day to register with late fee, Spring session
- 18 Victoria Day - University closed
- 19 Last day to cancel registration in or to add R classes Commerce Co-op Summer session
Last day to register with late fee, Commerce Co-op Summer session
Last Day to Drop Classes Without 'W' for DalTech Summer session
Last Day to Add Classes DalTech Summer session

19-23

- Spring Convocations
- 21 Last day to withdraw from A classes without a 'W', Spring session
- 27 Last day to withdraw from A classes, Spring session

June

- 3 A classes end, Spring session
- 4 B classes begin, Spring session
- 5 Last day to withdraw from R classes without a 'W', Spring session
- 10 Last day to cancel registration in or to add B classes, Spring session
- 15 Last day to withdraw from B classes without a 'W', Spring session
Last day to withdraw from R classes, Spring session
- 19 Last day to withdraw from B classes, Spring session
Last Day to Withdraw from DalTech Summer Classes with a 'W'
- 22 Last day to withdraw from R classes without a 'W', Commerce Co-op Summer session
- 24 Last day to register without late fee, Summer session
- 26 Classes end, Spring session

July

- 1 Canada Day - University closed
- 2 Classes begin, Summer session
Last day to apply to graduate in October
Fieldwork Level III (8 weeks) begins, School of Occupational Therapy

- 8 Last day to cancel registration in or to add A and R classes, Summer session
Last day to register with late fee, Summer session
- 10 Last day to withdraw from A classes without a 'W', Summer session
- 14 Last day to withdraw from A classes, Summer session
- 17 Last day to withdraw from R classes, Commerce Co-op Summer session
- 24 A classes end, Summer session
DalTech Summer Session Ends for Architecture
Last Day of Lectures for DalTech Summer Session for Engineering and Computer Science
- 27 B classes begin, Summer session
Last day to withdraw from R classes without a 'W', Summer session
- 27 Examinations Begin for DalTech Summer session for Engineering and Computer Science
- 31 Last day to cancel registration in or to add B classes, Summer session
Classes end, Commerce Co-op Summer session

August

- 1 Examinations begin, Commerce Co-op Summer session
- 3 Halifax/Dartmouth Natal Day - University closed
- 4 Examinations End DalTech Summer Session, Engineering and Computer Science
- 5 Last day to withdraw from B classes without a 'W', Summer session
Last day to withdraw from R classes, Summer session
- 6 Examinations end, Commerce Co-op Summer session
- 11 Last day to withdraw from B classes, Summer session
Classes begin, Outpost Nursing
- 19 Classes end, Summer session

September

- 4 Last Day to Register Without Late Fee, Regular session
First Installment of Fees Due
- 7 Labour Day - University closed
- 10 Classes begin unless otherwise specified, Regular session
Last day for refund on first installment of fees - limited enrolment programmes
Classes begin, Outpost Nursing
- 25 Last day to cancel registration in or to add A and R classes, Regular session
Last day to register with late fee
Last day for partial refund, regular session and first term
Last day to apply for Honours Programmes
Last day to change from Dalhousie to King's and vice versa

October

- 9 Last day to withdraw from A classes without a 'W'
Last day to change A classes from credit to audit and vice versa
Last day for partial refund of first term fees
- 12 Thanksgiving Day - University closed
- 17 Fall Convocation
- 30 Last day to change MATH 1000.03A/CHEM 1011.03A to MATH 1000.03R/CHEM 1011.03R

November

- 9 Last day to withdraw from A classes
Last day to withdraw from R classes without a 'W'
Last day to change R classes from credit to audit and vice versa
- 11 Remembrance Day - University closed
- 16 Last day to apply for admission to Winter term

December

- 1 Last day to apply to graduate in May
- 4 Classes end
- 7 Examinations begin
- 16 Examinations end

1999

January

- 1 University closed
- 4 Classes resume, unless otherwise specified, second term begins
Fieldwork (4th year) begins, School of Occupational Therapy

Calendar Revisions

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
Telephone: (902) 494-2450
Fax: (902) 494-1630
e-mail: Registrar@dal.ca

Dalhousie Calendars on the Web

The Dalhousie University calendars are available in electronic form on the World Wide Web. The primary access point is the Dalhousie University homepage at:

www.dal.ca

From the Dalhousie homepage, choose:

Academics

and then follow the appropriate navigation path.

Dalhousie University

The influence of Nova Scotia's largest university is felt throughout Canada - and well beyond. Founded in 1818, Dalhousie University provides a wide range of programmes from the undergraduate to the doctoral level in a dozen Faculties. It offers more than 3,600 classes in 172 undergraduate, graduate and professional degree programmes, as well as an extensive array of continuing education programmes. Dalhousie combines a tradition of excellence with learning for tomorrow. The university is proud of its excellent students and its loyal alumni, who play professional and community leadership roles across Canada and around the globe.

Dalhousie is located on a 79 acre campus in the heart of Halifax. Its 13,500 full and part-time students come from across the country and throughout the world. They benefit from personal education in an attractive environment, coupled with all the educational, cultural and recreational advantages of a major university. In addition to its teaching and research facilities, Dalhousie has a system of libraries, student residences of many kinds, an Arts Centre, an art gallery, a Student Union Building, athletic and recreational facilities and other facilities of many kinds. Major teaching hospitals, federal and provincial research laboratories and the provincial archives are all close at hand.

The amalgamation, last year, of Dalhousie University with the Technical University of Nova Scotia (now known as DalTech) has created a dynamic new centre of advanced technical education and research in Nova Scotia. DalTech, now a college within Dalhousie, houses the faculties of architecture, computer science and engineering. It continues the Technical University of Nova Scotia's tradition of leadership in education, research and technology transfer.

The University of King's College, situated adjacent to the 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 classes and services. Co-operation 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 co-operation with the College.

Dalhousie University is a member of the Association of Universities and Colleges of Canada and the Atlantic Association of Universities.

Executive Officers

President and Vice-Chancellor

Thomas Traves, BA, MA, PhD

Vice-Presidents

Academic and Research (Acting)

Warwick Kimmins, BA, PhD

Principal - DalTech

TBA

Finance and Administration

Bryan Mason, BA

Student Services

Eric McKee, BA, MA

Development & Alumni Affairs

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Associate Vice-President Research

Robert Fournier, BSc, MA, PhD

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Computer Science

Jacob Slonim, BSc, MSc, PhD

Dentistry

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Engineering

Adam Bell, BSc, BEng, MEng, PhD

Graduate Studies

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Health Professions

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Law

Dawn Russell, BA, LLB, LLM

Management

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Medicine

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Henson College of Public Affairs and Continuing Education

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College of Arts and Science

Graham Taylor, BA, PhD, Provost

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University Librarian (Acting)

Elaine Boychuk, BA, BLS

University Registrar

Gudrun Curri, MA, PhD

Coordinator of Policy Development

Julia Eastman, BA, MA

Associate Principal, Graduate Studies and Research

Feridun Hamdullahpur, BSc, MSc, PhD

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Computer and Information Services

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Instructional Development and Technology

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Office of Institutional Affairs

Brian Christie, BSc, MA, Assistant to the President for Planning

Directors

Alumni Affairs

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Arts Centre

Robert C. Reinholdt

Athletics and Recreational Services (Acting)

Karen Moore, BA

Capital Campaign

William Straitton

Counselling and Psychological Services

Judith Hayashi, BA, MA

Development

Charlotte Sutherland, BA, MEd

Environmental Health and Safety

William Louch, PhD

Facilities Management

William Lord, BAsC, PENG

Financial Services

Ian Nason, BCom

Health Services

Joyce Curtis, MD

Housing and Conferences

Heather Sutherland, BSc, MEd

Personnel Services

Michael Roughneen, CPIR, BA, MSc, FIPM

Public Relations

Michelle Gallant, BPR

Student Resources

Susan McIntyre, MPA

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

Sir Graham Day

Chancellor Emeritus

Rueben Cohen, CM, QC, DCL, LLD

Ruth Goldbloom, CM, DHumL, LLD

Officers

Mr. Allan C. Shaw, Chair

Mr. James S. Cowan, Vice-Chair

Mrs. Ann Petley-Jones, Vice-Chair

Mr. John C. Risley, Honourary Treasurer

Mr. Murray Coolican, Honourary Secretary

Mr. John Flemming

Mrs. Patricia Roscoe

Dr. Thomas D. Traves, BA, MA, PhD

Members

Mr. Chris Adams

Ms. Nancy Anderson

Mrs. Diane Bell

Mr. Gerald A. Clarke

Ms. Karen Cramm

Ms. Alexandra Dostal

Mr. Ivan E.H. Duvar

Mr. D. Andrew Eisenhauer

Mr. Fred Fountain

Mrs. Patricia Harris

Dr. Daurene Lewis

Ms. Bernadette Macdonald

Mr. George W. MacDonald

The Hon. Jacqueline R. Matheson

Ms. Marie Mullally

Dr. John T. O'Brien

Mr. Hugh Pierce

Mr. Kenneth C. Rowe

Mr. Phillip Saunders

Mr. Peter Stuart

Dr. Colin Stuttard

Secretary

Mrs. Shariene Drake

Observer for Faculty Association

Dr. Ismgt Ugursal

Senate

Senate consists of the President, Vice-President (Academic and Research), the University Librarian, Deans of Faculties, Dean of Henson College, forty-eight elected Faculty members, four students elected by the Dalhousie Student Union, a representative of the University of King's College and a representative of the Nova Scotia Agricultural College.

Senate is the academic governing body of the University. Subject to the general approval of the Senate, faculties are responsible for supervision of programmes of study, of teaching and research, and for recommending candidates for degrees, diplomas, and university prizes. In addition, it is responsible for student discipline academic appeals, and faculty appointments, tenure and promotion.

Chair of Senate

Colin Stuttard, BA, PhD

Vice-Chair of Senate

Georges Kipouros, DipEng, MAsC, PhD

Secretary of Senate

Ruth Bleasdale, BA, MA, PhD

Academic Programmes

Degrees and Diplomas

College of Arts and Science

- Bachelor of Arts - Major 3 years, Advanced Major^{1,2} 4 years, Honours^{1,2} 4 years
- Bachelor of Science - Major 3 years, Advanced Major^{1,2} 4 years, Honours^{1,2} 4 years
- Bachelor of Music - 4 years
- Diploma in Costume Studies - 2 years
- Advanced Diploma in Costume Studies - 3 years
- Diploma in Meteorology - 1 year

¹ BA and BSc with Minor in Business available for Advanced Major and Honours programmes.

² Co-op programmes are available in some subjects. See Departmental listings.

Faculty of Architecture

- Bachelor of Environmental Design Studies (BEDS) - 2 Years of Environmental Design following 2 years of university study

Faculty of Computer Science

- Bachelor of Computer Science (BCSc) - 4 years

Faculty of Engineering

- Bachelor of Engineering (BEng) - 4 years in the following disciplines: Biological, Chemical, Civil, Electrical and Computer Science, Industrial, Mechanical, Metallurgical, Mining

Faculty of Management

- Bachelor of Commerce - Major and Honours - 4 years
- Bachelor of Management - Major - 4 years
- Diploma in Public Administration - 1 year

Faculty of Health Professions

- Bachelor of Physical Education - 4 years⁴
- Bachelor of Science (Recreation) - 4 years
- Bachelor of Science (Recreation) with a Minor in Business - 4 years
- 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
- Bachelor of Science Nursing (Arctic Nursing) - 4 years
- 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 following one year general study, a wide choice permitted
- Diploma in Health Services Administration - 1 year
- Diploma in Outpost and Community Health Nursing⁴ - BN, BScN 9 months; RN, 15 months

⁴ This programme may not be offered in 1998/99. Interested persons should contact the School of Nursing.

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 Health Services 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
- Residencies - various programmes ranging from 2-6 years post-MD
- Doctor of Medicine with Master of Science - 6 years
- Doctor of Medicine with Doctor of Philosophy - 7 years

Faculty of Graduate Studies

- Master of Architecture (First-Professional) [MARFP] - 2 Years
 - Master of Architecture (Post-Professional) [MARPP] - 1 year
 - Master of Arts
- 1 or 2 years with thesis in: Classics, Economics, English, French, German, Health Education, History, International Development Studies, Leisure Studies, Philosophy, Political Science, Psychology, Sociology, and Social Anthropology, Women's Studies
- Master of Science
- 1 or 2 years with thesis in: Agriculture, Anatomy and Neurobiology, Applied Math, Atmospheric Science, Biochemistry, Biology, Chemistry, Community Health and Epidemiology, Computer Science, Earth Science, Engineering Math, Food Science, Human Communication Disorders (3 years) (Audiology or Speech Pathology), Kinesiology, Mathematics, Microbiology and Immunology, Oceanography, Occupational Therapy, Oral and Maxillofacial Surgery (4 years), Pathology, Pharmacology, Pharmacy, Physics, Physiology and Biophysics, Physiotherapy, Psychology, and Statistics, also Neuroscience (combined with Anatomy and Neurobiology, Biochemistry, Pharmacology, Physiology & Biophysics, and Psychology).
- Master of Science with Doctor of Medicine 6 years - Master of Science thesis in: Oral and Maxillofacial Surgery
 - Doctor of Philosophy 2 or 3 years, with thesis in: Biological Engineering, Anatomy and Neurobiology, Applied Math, Atmospheric Science, Biochemistry, Biology, Chemical Engineering, Chemistry, Civil Engineering, Classics, Computer Science, Earth Science, Economics, Electrical Engineering, English, Engineering Math, Food Science, French, History, Industrial Engineering, Interdisciplinary Studies, Mathematics, Mechanical Engineering, Microbiology, Metallurgical Engineering, Mining Engineering, Oceanography, Pharmacology, Pharmacy, Philosophy, Physics, Physiology & Biophysics, Political Science, Psychology, Sociology and Statistics, also Neuroscience (combined with Anatomy and Neurobiology, Biochemistry, Pharmacology, Physiology & Biophysics, and Psychology)
 - Doctor of Philosophy with Doctor of Medicine 7 years - Doctor of Philosophy thesis in: Anatomy, Biochemistry, Microbiology, Pharmacology, and Physiology & Biophysics
 - Doctor in the Science of Law - 2 years, with thesis
 - Master of Applied Science - 1-2 years
 - Master of Applied Science and Master of Urban and Rural Planning (MASMRP) - 2 Years

- Master of Business Administration - 2 years
- Master of Business Administration with Bachelor of Laws - 4 years
- Master of Engineering - 1 year
- Master of Engineering and Master of Urban and Rural Planning (MEMURP) - 2 years
- Master of Environmental Design Studies (MEDS) - 1 year
- Master of Environmental Studies - 1 or 2 years
- Master of Health Services Administration - 2 years
- Master of Health Services Administration with Bachelor of Laws - 4 years
- Master of Health Services Administration with Master of Nursing - 3 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 Nursing with Master of Health Services Administration - 3 years
- Master of Social Work - 1 or 2 years
- Master of Urban and Rural Planning (MURP) - 2 years
- Graduate Diploma in Public Administration - 1 year

Admission Requirements

Dalhousie University is an affirmative action and equal opportunity educational institution. Students who do not meet the normal admission requirements may choose to self-identify and request special consideration.

PLEASE NOTE: Admission to many programmes is limited. Possession of minimum requirements does not guarantee admission.

I. General Admission Requirements

PLEASE NOTE: Admission requirements for specific programmes are listed beginning in section III, Specific Admission Requirements. The following classes are acceptable for admission.

Admission requirements for students from high school for the 1999/2000 academic year are under review. Students planning admission for that academic year are encouraged to seek academic advice from the Office of the Registrar.

A. Students from Nova Scotia

Students wishing to study at Dalhousie should take at least five university preparatory classes designated as 44* or 54* or grade 12. Course distribution should be as follows:

Category 1: English

Category 2: At least two of biology, chemistry, French, geography, German, global geography, global history, history, Russian history, Latin, mathematics, or physics.

Category 3: The remaining classes may be from those listed above or from calculus, Canadian literature, comparative religion, computer-related studies, data processing, economics, environmental studies, journalism, law, modern world problems, music, political science, Russian, sociology, Spanish, statistics, 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%. Final grades in individual university preparatory classes other than mathematics and English must be at least 60%. Final grades in mathematics (if required) and English must be at least 65%.

PLEASE NOTE: Fulfilment of admission requirements does not necessarily provide the prerequisite background for all first year classes. Please consult the class description section of this calendar for specific class requirements.

B. Students from outside Nova Scotia

Students are admitted from other provinces and countries with preparation as shown below. The course distribution should be as for Nova Scotia.

Applicants must meet the admission requirements as outlined in the appropriate section of this calendar. Applicants who have completed studies in a College of Applied Arts and Technology (CAAT) may qualify for a maximum of five transfer credits if they have completed an appropriate three-year programme.

Students who do not qualify for admission may be eligible if they have completed a two-year, or three-year diploma which provides academic preparation on subjects related to their programme of study at Dalhousie. In this case, the student will not be eligible for transfer credit assessment.

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

Quebec: First year CEGEP with minimum 70% overall average, with no individual academic subject below 65%.

Ontario: OAC "English Studies in Literature" or "Language and Literature", plus four appropriate, approved OAC courses.

U.S.A.: Strong B average in Senior Year; submission of SAT scores of 1100 or better.

Bermuda: U.S.A. Grade 12 as above; post-graduate year or one year at Bermuda College with very good standing.

The United Kingdom, West Indies, West Africa: General Certificate of Education (GCE) with "C" standing in at least five subjects, of which one must be English and at least two must be at the Advanced Level. Ordinary level mathematics is required for admission to Science and Commerce; Advanced level mathematics is recommended for admission to Science. Two advanced-supplementary ("A/S") levels are considered equivalent to one advanced level subject.

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

India: Standard XII with very good standing in 10+2 system.

Middle East: Equivalent to U.S.A. Grade 12, GCE A-levels or one year of university with very good standing. Students with good standing (80% or better) in Arabic secondary school will be eligible for consideration.

For other Regions: write to the Registrar's Office, Dalhousie University, Halifax, N.S., B3H 4H6, or e-mail: admissions@dal.ca for further information.

C. Students with Learning Disabilities

Dalhousie University is committed to providing equal educational opportunities and full participation for students with learning disabilities. See University Regulations, pg. 17, for complete information.

D. Mature students

If you are at least 23 years old and have been out of full-time high school study for at least four years and have not attended university, 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. It is recommended that prospective students meet with an advisor well in advance of their intended registration as upgrading classes may be required. Contact Henson College at (902) 494-2526.

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. A transcript of academic work in high school and beyond may also be required. Please see Academic Regulations, Workload, on page 24 for information on the number of classes a University Exploration student may take in a single academic year.

E. Transfer Students

Students wishing to apply for transfer credit should consult Academic Regulation 8 on page 25 of this calendar as well as any additional requirements that may be listed under the appropriate degree heading. Certified copies of course descriptions from calendars are acceptable in lieu of originals. Certificates in languages other than English or French must be accompanied by certified translations into English.

Please note that transfer admission to the Bachelor of Commerce Co-op programme will not be allowed after September of the second year. Students transferring into this programme will be assessed a co-op transfer fee.

F. International and Exchange students attending Dalhousie as Visiting Students

International students must meet the following requirements:

- Good academic standing at the home institution
- Written academic approval from the appropriate department head, Dean or designate (e.g., Registrar) to undertake course work at Dalhousie (written approval is usually in the form of a letter of permission)
- The required student visa to study in Canada
- Proof of adequate health insurance for the duration of the stay in Canada.

PLEASE NOTE: Students studying for less than one full academic year are restricted from taking full-year classes (see Class Codes and Definitions).

G. Canadian and Local Students attending Dalhousie as Visiting Students

All students wishing to attend Dalhousie University on a letter of permission from their home university must submit the following:

- A completed application for admission
- Letter of permission from the home university
- Students applying from outside the Metro Halifax area must also submit an application fee. Local visiting students in Metro are not required to pay an application fee.

At the end of each academic session, grades will be forwarded to the home university on the student's behalf for students attending Metro Halifax universities only. All other students must arrange for transcripts to be sent to the home university.

PLEASE NOTE: Students studying for less than one full academic year are restricted from taking full-year classes (see Class Codes and Definitions).

II. Application Submission

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

- A completed application form (forms not properly completed will delay processing)
- The appropriate application fee for the programme (refer to Application for Admission form)
- An official record of high school work
- An official academic transcript from all previous post-secondary institutions (if applicable)
- Evidence of competency in English for applicants whose native language is not English (see the following section on English Language Tests)
- Supplementary information as required for specific programmes
- Mature applicants should also enclose a letter as indicated in Section I. General Admission Requirements, D. Mature Students

Documents, once submitted, become the property of Dalhousie University and cannot be returned.

A. January Admissions

Admission is normally for classes beginning in September. Admission of first-year students in January is not recommended because the number of introductory classes starting in this term is very limited. Part-time students and transfer students, however, may be admitted for classes beginning in January in BA, BCSc, BSc, BEng, BEDS, and Special Student programmes. The application deadline for January admission is November 15.

B. Response to Applications

Dalhousie will respond to your application as promptly as possible and will advise you of any documentation still required. Please notify the Registrar's Office if your address changes to avoid any delay in notification regarding your application.

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

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

C. Early acceptance

Applicants currently attending high school, who have good academic records and an admission average in the mid 70's or higher may be given early acceptance, conditional on satisfactory completion of work in which they are currently enrolled.

D. Final acceptance

Applicants must successfully complete high school classes in the required subjects with an average in the mid 70's or higher. An official transcript of final grades must be submitted to the Registrar's Office.

E. English Language Tests

Dalhousie requires TOEFL results of 580, MELAB results of 90 or IELTS results of 7.0. Scores which range within these standards will be considered along with other academic information. Information for MELAB 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. Application forms for the IELTS test may be obtained by telephoning (02) 950-9642 (Australia).

F. Language Training with the International Language Institute (ILI)

Dalhousie University, in association with ILI, is able to offer an English language training programme. Students who meet the academic admission requirements whose TOEFL score is 550 or better may be offered admission with the prerequisite of completing a 12-week English training programme. Students will begin their academic programme at Dalhousie following successful completion of the ILI programme with a TOEFL score of 580.

For information about ILI, contact the International Language Institute, 5151 Terminal Road, 8th Floor, Halifax, NS, Canada, B3J 1A1.

E-mail at study@ili.halifax.ns.ca

Web Site: <http://www.ili.halifax.ns.ca>

G. International Baccalaureate and Advanced Placement classes

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

III. Specific Admission Requirements

A. Faculty of Arts and Social Sciences

1. Bachelor of Arts

- Minimum of 65% in Grade 12 English
- Distribution as outlined under General Admission Requirements in section I.
- In addition to classes listed in category three in section I, the following university preparatory classes will be accepted: Business Organization and Management, Entrepreneurship 12.

2. Bachelor of Music

Students wishing to enrol in a degree programme offered by the Department of Music must fulfil 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, Royal Conservatory of Music in Toronto) and aural dictation: each is assessed through 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 on 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 seek further preparation 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 music 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 June 1 deadline.

3. Diploma in Costume Studies (2 years), Advanced Diploma in Costume Studies (3 years)

- Minimum of 65% in Grade 12 English
- Distribution as outlined under General Admission Requirements in section I.

Applicants are asked to submit a brief completion letter outlining their interest in the programme and their background in sewing, costume study/design and/or the theatre. University credits will enhance your application.

Due to the special nature of this programme, transfer credits for university work is not offered.

B. Faculty of Science

1. Bachelor of Science and Bachelor of Science Co-op

- Minimum of 65% in English and Mathematics 441 (pre-calculus) or equivalent
- Distribution as outlined under General Admission Requirements in section I.
- It is recommended that students interested in Science programmes take two science subjects in addition to pre-calculus math and English

2. The Dalhousie Integrated Science Programme (DISP)

The Dalhousie Integrated Science Programme is a 5 credit integrated first year programme in the sciences. See Dalhousie Integrated Science Programme in this calendar for more information.

Admission Requirements

- Class distribution as for regular BSc
- 80% average in grade 12 or OAC
- Minimum 75% in mathematics and English
- Minimum of one grade 12 or OAC science class

This programme has limited enrolment. Meeting the minimum requirements does not guarantee admission. Applicants should be interested in a variety of sciences. For further information contact: DISP@Dal.Ca or an Admissions Officer in the Registrar's Office.

3. Diploma in Meteorology

PLEASE NOTE: The Diploma in Meteorology will not be offered every year. It will be offered in 1998-99.

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:

- PHYC 1100.06, 2000.03, 2005.03, 2010.03, 2015.03, 3170.03;
- MATH 1000.03/1010.03, 2001.03/2002.03, 2030.03/2040.03, 2060.03/2080.03, 3110.03/3120.03; and
- COMP 1400.03/1410.03.

C. Faculty of Management

1. Bachelor of Commerce Co-op

- Minimum of 65% in English and Mathematics 441 or 442 or equivalent
- In addition to courses listed in category three, one of the following university preparatory courses will be accepted: Accounting, Business Organization and Management or Entrepreneurship 12.
- Transfer admission to the Bachelor of Commerce Co-op will not be allowed after September of second year.
- 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. Some visa students may prefer to select admission to the Bachelor of Arts or Bachelor of Science with a minor in Business programme.
- Please be advised that students who transfer into the BComm programme will be assessed a co-op transfer fee which consists of the co-op fee which would have been assessed in the first year of the programme. Please refer to the Fees section of this calendar for further details.

2. Bachelor of Management

The School of Business Administration will be offering a non-cooperative education business degree beginning in 1998/99. The degree is offered by special arrangement only and the School will not actively solicit applications. The degree replaces the former Bachelor of Commerce, non-co-op degree. Requests for information should be forwarded to the administrative officers of the School of Business Administration at (902) 494-7080.

3. Diploma in Public Administration

The programme leading to the Diploma 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 the following documentation to the Registrar's Office:

- Application for admission
- Application fee
- Letter outlining work experience and other activities
- High school transcripts

Please note that an interview may be required.

D. Faculty of Engineering

Bachelor of Engineering

- Minimum of 65% in English and Math 441 (pre-calculus) or equivalent, a minimum of 65% in Chemistry and Physics, plus one other acceptable class
- For those students beginning their Engineering programme at one of the following associated universities:
 - Acadia University
 - University College of Cape Breton
 - Nova Scotia Agricultural College
 - Saint Francis Xavier University
 - Saint Mary's University
 - University of Prince Edward Islandplease see page 338 of the calendar.

E. Faculty of Architecture

Bachelor of Environmental Design Studies

The following are the minimum academic requirements for admission:

- Two years (10 credits) of university study in any academic programme with a minimum GPA of 2.5
- One full-year class (or equivalent) in mathematics; Calculus is recommended, but a math-based class in Physics, Economics or Statistics also may be acceptable
- A portfolio of work (10-15 items) that demonstrates creative ability and/or artistic skill (for example, free-hand sketches, precision drawings, paintings, furniture, sculpture, craft objects, creative photography, construction projects, etc.). Photographs should be used for larger items.

For a full description of admission requirements, please refer to the "Architecture" section of this calendar.

F. Faculty of Computer Science

Please note that programmes of study in this Faculty are under review. Due to demand, the Faculty is currently increasing enrolment (1998-1999 year).

Bachelor of Computer Science or Bachelor of Science with a major in Computer Science:

- Minimum of 65% in English and Math 441 (pre-calculus), or equivalent
- Distribution as outlined under General Admission Requirements in Section I

G. 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 may be limited.

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.

1. School of Health Services Administration

a) Diploma in Health Services Administration

Applicants must meet the Dalhousie University undergraduate admission requirements.

A complete application consists of the following documents:

- An official transcript of the record of work done at high school and previous post-secondary institutions
- Mature students should include a letter indicating activities since attendance at high school and reasons for expecting to successfully complete a university programme if admitted
- One letter of reference
- Resume

2. School of Nursing

a) Bachelor of Science (Nursing) - Basic

- Satisfactory completion of Nova Scotia grade 12 or equivalent at the University preparatory level.
- Grade 12 English, chemistry, mathematics and biology.
- A 70% overall average and 70% in the required subjects.
- Mature applicants require GED, grade 12 chemistry and grade 12 mathematics, or have completed the Pre-Technology program at the Nova Scotia Community College.
- International applicants whose native language is not English will be required to pass either the TOEFL with a score of 580, MELAB with a score of 90, or IELTS with a score of 7.0.
- Transfer Students: Students transferring from other university programmes must have a minimum grade point average of 2.5.

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.

b) 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 the following additional conditions:

- Nurse registration as an active practising member in Nova Scotia or province/country of residence
- Successful completion of RN examination or equivalent
- Mature applicants will be considered on an individual basis. Upgrading in certain required subjects, e.g. chemistry and mathematics, may be recommended or required.

c) Bachelor of Science Nursing (Arctic Nursing)

A programme for Inuit is under development. Please contact the School of Nursing for further information.

3. School of Occupational Therapy

a) Affirmative Action Policy

The School of Occupational Therapy is committed to increasing the number of qualified occupational therapists who belong to indigenous Black or Aboriginal populations of the Atlantic region. If you belong to one of these groups and wish to take advantage of this policy, you may provide voluntarily this information about yourself. This will assist us in more effectively meeting our commitment to increase the number of qualified occupational therapists in these designated areas.

b) Bachelor of Science (Occupational Therapy)

Application to the School of Occupational Therapy should be made during the academic year in which it is expected that prerequisites will be completed.

Students considering Occupational Therapy should consult with the School of Occupational Therapy before their first registration. In Arts and Science at Dalhousie University the required first-year classes for Occupational Therapy preparation are:

- PSYO 1000.06, 1010.06 or 1500.06
- SOSA 1000.06, 1050.06, 1100.06, or 1200.06
- One elective (writing class)
- Two classes in different subject areas from: BIOL 1000.06; OR CHEM 1011.03/1012.03, 1020.06, 1041.03/1042.03; OR PHYC 1010.03 and 1020.03, 1100.06 or 1300.06
- Although not a requirement for admission, it is recommended that students complete STAT 1060.03 (or equivalent) prior to admission.

Students who complete the equivalent prescribed first-year programme at any recognized university will be given equal consideration for admission 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 35 of the 48 seats as follows: nine (9) positions to New Brunswick, eight (8) positions to Newfoundland and Labrador, 16 positions to Nova Scotia, and two (2) positions to Prince Edward Island. Selection is based on completion of prerequisites, academic achievement and personal suitability for Occupational Therapy.

A completed application for the School of Occupational Therapy consists of the required submissions (listed in II. Application Submission, earlier in this section) as well as:

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

4. College of Pharmacy

The College has an Affirmative Action Policy to increase the number of qualified pharmacists who belong to the Black and First Nation People of the Maritime region.

a) Bachelor of Science (Pharmacy)

Applicants to the BSc Pharmacy programme 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:

- CHEM 1011.03/1012.03, 1020.06, 1041.03/1042.03, 1500.06 or equivalent
- MATH 1000.03 and 1010.03 or equivalent (one full year of calculus)
- One of PHYC 1000.06, 1100.06, 1300.06 or equivalent OR BIOL 1000.06 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.

Transfer credits will not be granted for students who exceed the minimum admission requirements. The problem-based curriculum which integrates science, pharmaceutical science and pharmacy practice requires that students will complete all class work in the four year programme.

Incomplete applications and applications submitted after the deadline, February 1 (see Application Dates for details), will not be considered.

b) Selection Criteria

The selection criteria used by the Admissions Committee include:

- Place of residence
- Academic performance
- Scores on the Pharmacy College Admissions Test (PCAT)
- 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.

c) Place of Residence

This is the only College of Pharmacy for the Maritimes and therefore 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.

d) 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.

e) 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 October sitting in the year prior to which the applicant is seeking admission (e.g. October 1998 for admission September 1999). PCAT scores are valid for two years.

f) 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
- professional attitude
- problem solving.

g) 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 early September.

h) Deposit Fee

In addition to the deposit requirement section D (pg. 11), 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.

i) Special Cases

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

5. School of Physiotherapy

a) Affirmative Action Policy

The School has an affirmative action policy to increase the number of qualified physiotherapists who belong to the Black, Mi'kmaq or Inuit groups of the Atlantic region.

b) 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 classes at Dalhousie University or the equivalent at another university. Students studying at universities other than Dalhousie must ensure that the prerequisite classes they are taking are equivalent to the classes listed below by contacting the Registrar's Office.

- One credit from chemistry or biology. Acceptable classes are: CHEM 1011.03/1012.03, 1020.06, 1041.03/1042.03; OR BIOL 1000.06
- One credit in physics. Acceptable classes are: PHYC 1100.06, PHYC 1010.03/1020.03 or 1300.06
- One credit from psychology or sociology and social anthropology. Acceptable Dalhousie University classes are PSYO 1000.06 or 1010.06 or 1500.06; OR SOSA 1000.06 or 1050.06 or 1100.06 or 1200.06
- One-half (½) credit introductory statistics (STAT 1060.03)
- The equivalent of 1½ credits in Arts or Science electives. (One credit must fulfil a writing requirement, see list in Degree Requirements section of this calendar)
- 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 will be interviewed. A limited number of interviews will be conducted.
- 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.

c) Quota System

The School of Physiotherapy at Dalhousie University is the only School serving Atlantic Canada. Due to the 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 which are determined annually will be allocated to each Atlantic province.

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

d) Transfer Students

Students who wish to transfer to the School of Physiotherapy from another university programme 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 space in the programme. 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.

6. School of Health & Human Performance

a) Bachelor of Science (Recreation)

- i. Therapeutic Recreation
- ii. Recreation with a minor in business

The minimum requirement for entry into the Bachelor of Science (Recreation) programme Nova Scotia Grade XII (or equivalent) with an average of 70% in five university preparatory subjects, including:

- Minimum of 65% in English
- Biology or chemistry
- Distribution as outlined under General Admission requirements in Section I

Students already engaged in university study may transfer into the Bachelor of Science (Recreation). A background which includes full-year classes in Psychology, Sociology, Political Science or Economics, with a minimum grade point average of 2.30 (on a 4.30 scale) or higher.

The deadline for receipt of applications to the programme is June 1st of each year. 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.

b) 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:

- Minimum of 65% in English
- Biology or chemistry

- Distribution requirements as outlined under General Admission Requirements in Section I

NOTE: Mathematics 441, or the equivalent, is a prerequisite for many classes in mathematics, science and computing science at Dalhousie.

Students already engaged in university programmes can transfer into the Health Education programme. A minimum grade point average of 2.30 (on a 4.30 scale) or higher is required. Experienced persons in the workplace may be admitted as mature students. Inquiries about admission to this programme should be directed to the Undergraduate Associate Director of the School.

The deadline for receipt of applications to the programme is June 1st of each year. Thirty students will be accepted for the 1998/99 academic year.

c) *Bachelor of Science (Kinesiology)*

Admission to this programme is highly competitive. Admission from high school requires a minimum 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 or equivalent is a prerequisite for many classes in mathematics, science and computing science at Dalhousie).

Transfer Students:

In order to be admitted to the Kinesiology programme, students transferring from other university programmes are expected to have a minimum GPA of 2.30 (on a 4.30 scale). The deadline for receipt of applications to the programme is June 1st of each year. Ninety students will be accepted for the 1998/99 academic year.

7. Maritime School of Social Work

a) *Bachelor of Social Work*

All applicants must meet the following minimum requirements:

- Completion of five university credits (30 credit hours) in subject areas other than Social Work that provide suitable academic preparation for Social Work
- Cumulative grade point average of 2.70 (on a 4.30 scale) or equivalent cumulative academic average of at least B-, or 70%
- Personal maturity and suitability for Social Work.

b) *Degree Requirements*

The BSW program consists of three years of full-time Social Work study following completion of the five prerequisite credits at the required average grade level. Persons with a degree on entry, however, normally complete the program in two full-time years, or part-time equivalent. Students with more than five credits and less than a fifteen-credit degree on entry complete a partial three-year programme.

c) *Personal Suitability*

Aptitude and fitness for the profession of Social Work, as determined by the BSW Admissions Committee, is a requirement for admission. Because the nature of study and practice of Social Work places clients in a position of special trust in relation to social workers and social work, certain types of conduct or impairments may be considered unsuitable for the acceptance of an applicant. The following list illustrates examples of criteria used to assess unsuitability in aptitude and fitness. Other behaviours may also be considered:

- Unethical behaviour. (See Nova Scotia Association of Social Workers Code of Ethics, revised October 1994.)
- 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 judgment
- Persistent substance abuse (e.g., alcoholism, drug addiction, use of illegal drugs)
- Conviction of criminal activity (e.g., assault, sexual assault, fraud and drug trafficking).

In considering the applicant's qualifications, including personal suitability for the study and practice of Social Work, the Admissions Committee observes the principles of confidentiality, natural justice and due process.

d) *Affirmative Action Policy*

Recognizing the need to remedy the effects of systemic discrimination, the Maritime School of Social Work has an affirmative action policy for residents of the three Maritime provinces who belong to regional Aboriginal, Acadian and indigenous Black populations, and for persons with disabilities. Members of these groups who have five general (non-social work) university credits that average B- or 70% are encouraged to apply.

The School is committed to admitting and graduating students who qualify under its affirmative action policy. Applicants who do not yet have the required university credits can request an assessment of their admissibility upon completion of five credits. Further information is available from the Admissions Coordinator, School of Social Work.

e) *Recommended Academic Preparation for Social Work*

High school and other students entering university for the first time are advised to wait until the final year of their first degree before applying to the BSW programme. Because of the competitive nature of the Social Work admissions process, potential applicants are reminded to keep alternate career choices open when deciding upon a degree and selecting classes.

Recommended degrees for providing relevant preparation for Social Work are Bachelor of Arts, with concentration in one or more of the social sciences, or Bachelor of Science in Psychology. Suggested first-year classes for a BA programme include:

- 1 credit - writing class (preferably English)
- 1 credit - introductory sociology
- 1 credit - introductory psychology
- 1 credit - introductory political science, women's studies, economics, history, or other social sciences
- 1 credit - elective

Potential applicants are also strongly encouraged to include social science content in the second and third years of their undergraduate study.

f) *Other Preparation*

Acceptance for professional Social Work training requires a well-developed background as expressed not only in solid academic achievement but also in relevant work and/or volunteer experience. Summer or part-time jobs in areas of social or human services that bear a direct relationship to social work are definite assets. Volunteer activities in which there is direct personal contact, preferably with on-the-job training and supervision can contribute meaningfully to the applicant's preparedness for Social Work practice.

High school students can use volunteer positions as a way to explore their interest in Social Work and at the same time gain practical experience that will be an asset later. A personal history of service commitment is a qualification that increases in value over a period of time.

g) *Selection Criteria*

Candidates with the best qualifications are selected once a year by the admissions committee for first-time enrolments in September on a combined basis of:

- Completion of the admission prerequisites
- Level of academic achievement, particularly in relevant subject areas
- Successful experience in work similar to social work
- Relevant volunteer work
- Strength of academic and work/volunteer references
- Evidence of personal maturity and suitability
- Preparedness for social work and social work education.

In the assessment of applications, priority is given to those who have completed or who are about to complete an undergraduate degree, and who have obtained related work/volunteer experience.

NOTE: Interviews are not a part of the admissions process, unless specifically requested by the Admissions Committee to address a need for further clarification.

Academic Achievement. An initial screening is made on the basis of academic eligibility. Credits from non-university programmes do not qualify for consideration.

All university classes are included in the cumulative academic average, including failures. Grades and grade point averages are interpreted according to the grading scale of the university attended, as stated in the transcript key. In the case of academic credits currently in progress, selections are made on the basis of mid-year grades.

A cumulative GPA of 2.7 (B- or 70%) is necessary for an application to be considered further.

Related Work and Volunteer Experience. In the Admissions Committee's experience, varying amounts of related work and/or volunteer experience contribute to the applicant's preparedness for undertaking social work education and practice.

Preference is given to those who are currently working in social or human services directly related to social work for a period of at least two years. Such applicants are considered on a combined basis of their cumulative performance in five or more credits of previously completed university study and their demonstrated ability for the practice of social work.

Demonstrated ability for Social Work includes the nature and length of current or previous employment, and positive work references. Other experience in community services will also be taken into consideration. Places are offered only to the most qualified candidates with two or more years of related work experience.

Candidates with directly related work experience as above but no previous university study must complete the prerequisite five general university credits with a minimum GPA of 2.70 (B-, 70%) prior to the application deadline date. (See the Admissions Prerequisites section above.) Those who expect to complete their fifth credit by May will also be considered, on the understanding that their priority will be reduced in relation to the number of credits which have final grades by December, and in relation to candidates with completed degrees.

References and Personal Statement. The BSW application package contains three reference forms and a personal statement, with instructions for completion. These provide a basis for assessing the candidate's personal suitability and readiness for professional training in Social Work.

h) Application Procedure

Applications for admission are assessed once a year for first-time enrolment in September only.

The deadline date for postmark and personal delivery of applications and all supporting documents is March 1st. It is advisable to submit the application form and fee, and to request official transcripts early in January.

Candidates should ensure that they receive the undergraduate Application for Admission form *and* the BSW application package from the Registrar's Office at Dalhousie. Acknowledgment of receipt of all supporting documents and related follow-up are issued by the School.

Incomplete and late applications are not considered. Reminders will be sent to selected applicants in April regarding missing reference forms or transcripts from files that are otherwise complete. A final date for resubmitting these will be given, after which all files with missing documents will not be considered.

Applicants are notified by mail during the first week of June of the Admission Committee's final recommendation to the University Registrar. Acceptances are conditional on the receipt of final transcripts.

H. Faculties of Dentistry, Law, Medicine, and Graduate Studies

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

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 Board of 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 on the specific recommendation of the admissions committee of the relevant Faculty or School, which shall take into account all aspects of the applicant's preparedness for the class or programme involved, and which may attach such conditions to the applicant's admission as the committee judges appropriate.
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 who change their name while attending Dalhousie must provide proof of name change to the Registrar's Office.
6. Students taking classes in another Faculty as part of an affiliated course of study 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.
7. In the interests of public health in the University, students are encouraged to have a tuberculin test. This is compulsory for Dentistry, Dental Hygiene, Physiotherapy and Nursing students. Facilities for testing are arranged by the University Health Services.
8. 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 on a student's request to other universities, or to business organizations, etc.
9. Students withdrawing voluntarily from the University should consult the individual faculty regulations and the Fees section of this Calendar.
10. 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.

11. 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 degree/ diploma is to be mailed. Students whose accounts are delinquent on April 15 will not receive their degree/ diploma parchment nor their transcripts. For October graduation the date is September 1.
12. 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.

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. Candidates may not leave their seats during an examination except with the consent of the invigilator.
5. 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.
6. Each question should be started on a separate page.
7. 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.
8. 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.
9. 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.

Retention of Student Work

Faculties of Architecture, Computer Science and Engineering
All work executed by students as part of their academic programmes at DalTech automatically becomes the property of the University and may be retained for exhibition or other purposes at any time and for an indefinite period.

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
- Field of Study (as relates to degree 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.

Policy on Accessibility for Students with Disabilities

1. Dalhousie University is committed to the goal of providing equal opportunity for qualified students with disabilities. To demonstrate full respect for the academic capacities and potential of students with disabilities, the University seeks to remove attitudinal and environmental restrictions which may hamper or prevent academically-qualified students with disabilities from participating fully in University life. The University understands that persons with disabilities may have different ways of doing things, recognizing that performance is not inferior merely because it is different.
2. The University recognizes, subject to its financial and other resource constraints, that qualified students with disabilities have a right to:
 - 2.1 full access to all educational programmes;
 - 2.2 full access to the educational process and learning environment (including but not limited to classes, laboratories, workshops);
 - 2.3 full access to the University campus; and
 - 2.4 full access to University facilities and services.
3. The University recognizes that qualified students with disabilities have a right to assistance that is individualized with respect to scope and pace, consistent with the student's needs, legitimate academic demands, and the University's capacity to respond.
4. To ensure that qualified students with disabilities may pursue quality post-secondary education, the University shall:
 - 4.1 be proactive in fostering, creating and maintaining a barrier-free environment, including:
 - (a) the provision of support services, within reasonable financial and resource limitations; and
 - (b) promoting an attitude of respect for persons with disabilities, and
 - (c) promoting sensitivity to the needs and abilities of persons with disabilities;
 - 4.2 inform the University community about the services available to qualified students with disabilities and seek to ensure that such services are delivered in ways that promote equity;

4.3 where warranted and without compromising the academic standards, and through the relevant academic authority, modify:

- (a) workload;
- (b) examination procedures;
- (c) other course requirements; and
- (d) scholarship and other financial assistance requirements; and

4.4 take all reasonable steps to consult students with disabilities as fully as possible about decisions relating to matters affecting them.

5. In accordance with provisions in the Human Rights Act, the University may also define essential requirements for professional performance for students in programmes, where these are appropriate, and this policy is not intended to replace or supersede these requirements.

6. Students with disabilities requiring assistance from the University shall:

6.1 initiate contact with the Advisor to Students with Disabilities and make the nature of their disability and/or their needs known; and

6.2 be expected to undertake a reasonable measure of self-advocacy to ensure they are provided with an equal opportunity by Dalhousie University.

7. The responsibility to implement these policies throughout the University rests on all members of the University community, including all faculty, administration, staff, students and the Advisor to Students with Disabilities.

Procedures Regarding Students with Learning Disabilities

Dalhousie University is committed to providing equal educational opportunities and full participation for students with learning disabilities. These procedures regarding students with learning disabilities derive from the University's Policy on Accessibility for Students with Disabilities as stated above. These students are intellectually capable and possess potential which may not be fully realized without a recognition of their special needs. We are both morally and legally required to supply such support consistent with the Policy on Accessibility for Students with Disabilities.

I. Admission

Students with diagnosed learning disabilities who meet the current admission requirements for Dalhousie University may follow the current admission procedures. All new Dalhousie students will receive in the offer of admission a statement indicating that, if they have a learning disability or any other disability for which they will require accommodations or special assistance, they should contact the Advisor to Students with Disabilities, in order to ascertain the degree to which their needs can be met.

Students with diagnosed learning disabilities who do not meet the current admission requirements or who otherwise wish to have their learning disability considered may apply for special consideration as may all other students who have extenuating circumstances. These requests will be made to the appropriate admissions committee, acting in consultation with the Advisor to Students with Disabilities and the other knowledgeable professionals.

The following documentation must be submitted by students who wish to apply for special consideration:

1. Letter(s) of recommendation from the individual(s) most familiar with the applicant's academic performance and/or potential for success at university;
2. A written, oral or electronic statement from the student. In this brief personal statement, students should describe their learning disability, how this affected their grades and the type of assistance they would require while at Dalhousie University;
3. A current (within three years) psychological assessment based on standard diagnostic instruments administered by a registered psychologist documenting the presence of learning disabilities. If a current report is not possible, Dalhousie

University may accept an earlier report along with a current opinion (i.e., within the past year) expressed in a letter by a registered psychologist (or individual supervised by a registered psychologist) that the student has a learning disability. This letter should specify the nature, extent and rationale for programme modifications or accommodations that were deemed appropriate in the student's last two years of schooling.

II Academic Accommodation for Students with Learning Disabilities

Students requesting academic accommodation will arrange a personal interview with the Advisor to Students with Disabilities. Schools and Faculties will provide relevant Faculty committees and individual Faculty members with fairly specific instruction as to the circumstances in which certain types of accommodation are normally to be made (e.g., the language requirement of the Faculty of Arts and Social Sciences). The Advisor to Students with Disabilities will assist faculty and students in developing reasonable accommodations.

A. Documentation Required

The student will provide the Advisor with a current (within three years) psychological report documenting the presence of a learning disability as outlined in Section A. above.

B. Procedures Regarding Academic Accommodation

Students are expected to identify themselves as having a learning disability and inform the Advisor to Students with Disabilities as early as possible and preferably before the beginning of the term. They should make this initial contact during office hours and be prepared to discuss strengths, weaknesses and the types of accommodation that may be necessary.

The Dalhousie University Policy on Accessibility for Students with Disabilities will guide the Faculties and the relevant committees in their deliberations. That policy specifies three factors that must be taken into account when considering requests for accommodations from students with disabilities: the needs of the students; preservation of the academic integrity of the programmes; and the ability of the University to provide resources.

C. Types of Academic Accommodation

The types of academic accommodation provided for students with learning disabilities may vary depending on the nature of the learning disability and the class content. For example, a student may benefit from an oral exam in one subject area, but not in another. It is not unusual for there to be an initial trial-and-error period of finding the best way to evaluate a student's ability to demonstrate mastery of class material.

Accommodations for students with learning disabilities typically can include but are not necessarily limited to the following:

- a. Extend the time permitted for a student with a learning disability to earn a degree;
- b. Modify programme requirements (e.g., class substitutions);
- c. Permit examinations to be proctored, read orally, dictated or typed;
- d. Allow extra time for completion of examinations and extend the time for the examination period;
- e. Change the test format (e.g., multiple choice to essay);
- f. Provide alternative formats for class materials;
- g. Permit basic four-function calculators and standard desk dictionaries during examinations;
- h. Use alternative methods for students to demonstrate academic achievement (e.g., a narrative tape instead of a journal);
- i. Permit review of final drafts of term papers with a proof-reader and make changes without altering content; and
- j. Use computer software programs to assist in test-taking.

D. Appeals

Admission and programme appeals by students with learning disabilities will follow the usual procedures of the relevant Faculty at Dalhousie University.

E. Release of Information About Students

A student will be told before disclosing any information on learning disabilities that such information will be governed by the University Regulations on the Release of Information as indicated in this calendar.

III. Support Services

Dalhousie University endeavors to provide a broad range of support services to all of its students. Students wishing to obtain assistance from the University shall be expected to undertake a reasonable measure of self-advocacy to ensure that they are provided with the support services necessary. Such support services may include personal counseling, academic counseling, academic advising, and academic skill training.

NOTE 1: Accommodation of a student's needs due to disability will be facilitated if the student self-discloses and makes prior arrangements. Accommodation may be hindered if advance notification and/or prior arrangements have not been made

Intellectual Honesty

A University should epitomize the quest for intellectual honesty. Failure to measure up to the quest for such a standard can result in an academic offence. 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.

Examples of Academic Offences

1. 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.

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 attribution standards of the discipline concerned in the preparation of essays, term papers and dissertations or theses may, in some cases, constitute plagiarism.

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 members 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.

2. 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.

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.

4. 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).

5. Irregularities in Evaluation Procedures

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

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

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, see examples above, (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. 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.
4. 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.

Senate Discipline Committee

A. Composition

The Committee comprises six representatives of the faculty elected by Senate for staggered three-year terms, one of whom shall be the Chair (chosen annually by the Committee), and four representatives

of the student body. A student who is a member of the Judicial Board of the DSU may not at the same time be a member of the Senate Discipline Committee.

The Senate Nominating Committee shall arrange for nominations to fill casual vacancies for the remainder of the second term.

B. Functions

The Senate Discipline Committee shall:

1. consider all complaints or allegations respecting offenses or irregularities of an academic nature, including those relating to admissions procedures and evaluation procedures, and may impose penalties in cases where the Committee finds an offence or irregularity has occurred;
2. have the power to discipline a student who, before or during the course of the disciplinary process involving him or her but prior to adjudication, has:
 - (i) been compelled to withdraw academically;
 - (ii) chosen to withdraw from the University prior to being disciplined; or
 - (iii) chosen not to register at the University;
3. 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; complaints or allegations may be made by faculty or other evaluators of academic work done by students; a panel of Student-Discipline Officers is available to assist and advise evaluators, and guidelines for evaluators are set out in the document entitled Guidelines for Academic Evaluators Regarding Violations of Academic Regulations by students;
4. conduct open hearings according to the rules of natural justice and such other procedures as the Committee may decide in advance, with due notice to all interested parties. A panel of three faculty and two students shall hear each complaint, including complaints made under the Code of Student Conduct. The Committee Chair or alternate chosen by and from the Committee shall chair each hearing;
5. evaluate the evidence of innocence or guilt of an accused student. This evaluation shall include the premise that the more senior the student in terms of chronological age, year of university registration, extent of other exposure to university rules and regulations at Dalhousie University or elsewhere, the less credible are assertions of ignorance or innocence and the stronger is the case for a more severe penalty than would be imposed on a less senior student;
6. report its findings, and any penalty imposed to the Secretary of Senate who shall forward a copy of the report to the student; if the alleged offender is not a student, a copy shall also be sent to the Vice-President (Academic and Research)

C. Appeals

An appeal from the decisions of the Senate Discipline Committee may be made to the Senate on such grounds as it determines are appropriate.

Where a Faculty, such as Health Professions, wishes to dismiss a student for their unethical conduct or unsuitability for any health profession, there is no appeal to the Senate Discipline Committee. Instead, an appeal may be made to a Senate *ad-hoc* committee.

D. Penalties

The range of penalties which may be imposed by the Senate Discipline Committee be circumscribed only by the requirement that such penalty or penalties be of an academic nature and, without restricting the generality of the foregoing, may include any one or more of:

- (i) notation of the fact of discipline on the offender's transcript for a period of one (1) or more years, but not exceed five (5) years;
- (ii) repeat of the assignment that triggered the discipline;
- (iii) a falling grade or mark or assessment in the piece of work triggering the discipline;
- (iv) failure of the class or seminar or programme;
- (v) failure of the academic year;
- (vi) suspension for an academic term or year (to a maximum suspension of three (3) academic years);

- (vii) expulsion from the University;
- (viii) loss of a current or continuing scholarship, or both, or loss of eligibility to receive or to maintain scholarships or prizes or bursaries; and
- (ix) removal from the Dean's List.

PLEASE NOTE: Transcripts will not be issued for a student while a Senate Discipline case is pending.

Code of Student Conduct

Commentary

1. Dalhousie University is a community of faculty, support staff and students, involved in teaching, research, learning and other activities. Students are members of the University for the period of their registration in the academic programme to which they have been admitted and as such assume the responsibilities that such registration entails.
2. The University does not stand *in loco parentis* to its student members, that is, it has no general responsibility for the moral and social behaviour of its students, as if they were its wards. In the exercise of its disciplinary authority and responsibility, the University treats students as free to organize their own personal lives, behaviour and associations subject only to the law and to University regulations that are necessary to protect the integrity of University activities, the peaceful and safe enjoyment of University facilities by other members of the University and public, the freedom of members of the University to participate reasonably in the programmes of the University and in activities in or on the University's premises, or the property of the University or its members. Strict regulation of such activities by Dalhousie University is otherwise neither necessary nor appropriate.
3. University members are not, as such, immune from the criminal and civil laws of the wider political units to which they belong. Provisions for non-academic discipline should not attempt to shelter students from their civic responsibilities nor add unnecessarily to these responsibilities. Conduct that constitutes a breach of the Criminal Code or other statute, or that would give rise to a civil claim or action, should ordinarily be dealt with by the appropriate criminal or civil court. In cases, however, in which criminal or civil proceedings have not been taken or would not adequately protect the University's interest and responsibilities as defined below, proceedings may be brought under a discipline code of the University.
4. The University must define standards of student behaviour and make provisions for student discipline with respect to conduct that jeopardizes the good order and proper functioning of the academic and non-academic programmes and activities of the University or its faculties, schools or departments, or that endangers the health, safety, rights or property of the University or its members or visitors.
5. The University may also define standards of professional conduct for students in programs where these are appropriate, and this Code is not intended to replace or supersede such standards.

A. Definitions

1. In this Code, the word "premises" includes lands, buildings and grounds of the University, or other places or facilities used for the provision of the University's programs or services or for University-approved events and activities.
2. In this Code, "student" means a person:
 - (i) engaged in any academic work or placement which leads to the recording and/or issue of a mark, grade or statement of performance by the appropriate authority in the University or another institution; and/or
 - (ii) registered in, enrolled in, or attending any course or class, or otherwise participating as a learner in any activity which entitles the person to the use of a University library, library materials, library resources, computer facility or dataset.
3. In this Code, the words "Dalhousie University" refer to Dalhousie University and include any institutions affiliated with it, where such inclusion has been agreed upon by the

University and the affiliated institution, with respect to the premises, facilities, equipment, services, activities, students and other members of the affiliated institution.

4. Unless otherwise stated, a student will only be liable for conduct that she or he knew or ought reasonably to have known would constitute conduct prohibited under this Code.
5. Nothing in this Code shall be construed to prohibit peaceful assemblies and demonstrations, or lawful picketing, or to inhibit freedom of speech.

B. Offences

The following conduct shall be deemed to be an offence under this Code, when committed by a student of Dalhousie University, provided that such conduct:

- (i) occurs on premises of Dalhousie University or elsewhere in the course of activities sponsored by Dalhousie University or by any of its faculties, schools or departments; and
- (ii) is not specifically assigned to another disciplinary body within the University as in the case of sexual harassment as described in the Policy and Procedures: Sexual Harassment; and
- (iii) (a) has not already been dealt with as failure to meet standards of professional conduct as required by a college, faculty or school; or
 - (b) is not subject to the disciplinary authority of the Dalhousie Student Union; or
 - (c) is not subject to action under a residence discipline policy unless some non-residence University interests are deemed to be involved, in which case the President may specifically authorize proceedings under this Code.

1. Offences Against Persons

- (a) No student shall assault another person sexually or threaten any other person with sexual assault.
- (b) No student shall otherwise assault another person, threaten any other person with bodily harm, or cause any other person to fear bodily harm.
- (c) No student shall create a condition that unnecessarily endangers the health or safety of other persons.
- (d) No student shall threaten any other person with damage to such person's property, or cause any other person to fear damage to her or his property.

2. Disruption

No student shall undertake by action, threat or otherwise, to disrupt, obstruct or adversely affect any activity organized by Dalhousie University or by any of its faculties, schools or departments, or the right of another person or persons to carry on their legitimate activities, to speak or to associate with others.

3. Offences Involving Property

- (a) No student shall take without authorization, mis-use, destroy or damage the property or premises of Dalhousie University, or property that is not her or his own, or information or intellectual property belonging to Dalhousie University or to any of its members.
- (b) No student shall deface the property of Dalhousie University.
- (c) No student shall possess the property of Dalhousie University, property in the custody of Dalhousie University, or property that is not her or his own, if the student knows that property to have been appropriated without authorization.
- (d) No student shall create a condition that unnecessarily endangers or threatens destruction of the property of Dalhousie University or of any of its members.

4. Unauthorized Use of University Facilities, Equipment or Services

- (a) No student shall use any facility, equipment or service of the University, or enter or remain on any premises, to which he or she does not have legitimate access, or contrary to the expressed instruction of a person or persons authorized to give such instruction, unless the student has good reason for doing so.
- (b) No student shall gain access to or use any University computing or internal or external communications facility to which legitimate authorization has not been granted. No

student shall use any such facility for any commercial, disruptive or unauthorized purpose, or in any other way that is incompatible with the principles in the Guide to Responsible Computing.

- (c) No student shall mutilate, misplace, misfile, or render inoperable any stored information such as books, film, data files or programs from a library, computer or other information storage, processing or retrieval system.

5. Aiding in the Commission of an Offence

No student shall encourage or aid another student in the commission of an offence defined in this Code, or encourage or aid behaviour by a non-student which, if committed by a student, would be an offence under this Code.

6. Alcohol and Drug Use

No student shall contravene the Liquor License Act of Nova Scotia or a provision of the Campus Alcohol Policy, nor shall any student possess, use or sell a drug to which access is restricted by the Narcotics Control Act.

7. False Information and Identification

- (a) No student shall knowingly furnish false information to any person or office acting on behalf of the University.
(b) No student shall forge, alter or misuse any document, record or instrument of identification.

8. Unauthorized Possession of a Firearm or Weapon

No student shall possess a firearm or other weapon on the University premises without the specific written permission of the Chief of Security.

9. Contravention of University Regulations

When a rule, regulation or policy of the University prohibits or proscribes certain conduct but does not provide any penalty for breaches of the rule, regulation or policy, breaches shall be dealt with under this Code.

10. Other

No student shall contravene any provision of the Criminal Code or any other federal, provincial or municipal statute on the premises of the University or in the course of the University's programs or services, or University-approved events or activities.

C. Procedures

1. Whenever possible and appropriate, reason and moral suasion shall be used to resolve issues of individual behaviour before resort is made to formal disciplinary procedures.
2. Any person may make a complaint against any student for misconduct. A complaint shall be prepared in writing and directed to the Vice-President, Student Services. Any complaint should be submitted as soon as possible after the event takes place. All complaints shall be presented to the accused student in written form.
3. The Vice-President, Student Services, or designate shall conduct an investigation to determine if the complaint has merit and/or if it can be disposed of informally by mutual consent of the parties involved on a basis acceptable to the Vice-President, Student Services. The Vice-President, Student Services, shall invite the President of the Student Union or his or her designate to participate in any attempts to resolve the matter informally. If an informal disposition of the complaint results, such disposition shall be final and there shall be no subsequent proceedings.
4. If the complaint cannot be resolved informally through the procedures described in section 3, or if in the judgment of the Vice-President, Student Services, it is not appropriate for the complaint to be so resolved, the Vice-President, Student Services, shall refer the complaint to the Senate Discipline Committee for a formal hearing.
5. Hearings shall be conducted by the Senate Discipline Committee according to procedures determined by the Committee.
6. The President or designate shall appoint a person to present the complaint.
7. If a student fails to appear at a hearing, the hearing may proceed, provided that the student has been given adequate

notice. Except in the case of a student charged with failing to obey the summons of the Committee or University official, no student may be found to have violated the Student Code solely because the student failed to appear before the Committee. In all cases, the evidence in support of the complaint shall be presented and considered.

D. Sanctions

1. In each case in which the Senate Discipline Committee determines that a student has violated the Student Code, the sanction(s) shall be determined and imposed by the Committee.
2. The following sanctions may be imposed upon any student found to have violated the Student Code:
 - (a) Warning—A notice in writing to the student that the student is violating or has violated institutional regulations.
 - (b) Probation—A written reprimand for violation of specified regulations. Probation is for a designated period of time and includes the probability of more severe disciplinary sanctions if the student is found to be violating any institutional regulation(s) during the probationary period.
 - (c) Loss of Privileges—Denial of specified privileges for a designated period of time.
 - (d) Fines—Previously established and published fines may be imposed.
 - (e) Restitution—Compensation for loss, damage or injury. This may take the form of appropriate service and/or monetary or material replacement.
 - (f) Discretionary Sanctions—Work assignments, service to the University or other such discretionary assignments that are considered appropriate by the Discipline Committee.
 - (g) Conditions—Conditions may be imposed upon a student's continued attendance.
 - (h) University Suspension—Suspension of the student from the University for a specified period of time, after which the student is eligible to return. Conditions for readmission may be specified.
 - (i) University Expulsion—Permanent separation of the student from the University.
3. More than one of the sanctions listed above may be imposed for any single violation.
4. Other than expulsion from the University and suspension for the duration of its effect, disciplinary sanctions shall not be made part of the student's academic record, but shall be kept on file in the Office of the Vice-President, Student Services, for use in the event of further breaches of this Code.
5. No student found guilty of an offence under this Code shall refuse to comply with a sanction or sanctions imposed under the procedures of this Code. Such refusal will constitute grounds for the imposition of additional sanctions.
6. The Committee may direct that a sanction be held in abeyance if a student's registration at the University is interrupted for any reason.

E. Interim Suspension

In the following circumstances, the President of the University, or a designate, may impose an interim suspension prior to the hearing before the Committee.

1. Interim suspension may be imposed only: (a) to ensure the safety and well-being of members of the University community or preservation of University property; (b) to ensure the student's own physical or emotional safety and well-being; or (c) if the student poses a threat of disruption or of interference with the normal operations of the University.
2. During the interim suspension, students may be denied access to specified campus facilities (including classes) and/or any other University activities or privileges for which the student might otherwise be eligible, as the President or the designate may determine to be appropriate.
3. A student who is the subject of an interim suspension may request a hearing before the Senate Discipline Committee on the issue of the interim suspension itself. This request shall be submitted in writing, with reasons, to the Secretary of Senate.

The Committee shall hear the matter, including submissions by the President or designate, within ten working days, and shall have the authority to confirm, negate, or alter the terms of the interim suspension.

Suspension or Dismissal from a Programme on the Grounds of Professional Unsuitability - Faculty of Health Professions

The Faculty of Health Professions, acting through its Committees on Studies at the School/College and Faculty levels, and in consultation with the Directors and Dean, may suspend or terminate a student from a programme if the student is judged to be unsuitable for the profession in which s/he is studying. Because of the nature of the study and practice of the various health professions, which places caregivers in a position of special trust, certain impairments or some types of conduct unbecoming to a member of a health profession may be grounds for suspension or dismissal.

The following list includes examples of behaviours that might indicate unsuitability for the various health professions. The nature of these behaviours is such that, should any of them ever be repeated, grievous harm could be caused to clients. This list should not be considered to be all inclusive:

- (i) a criminal act (e.g., assault, sexual assault, fraud, and drug trafficking) which according to established Faculty processes was determined to be of such a nature as to bring disrepute to the profession, or by which in the opinion of the Faculty, the student demonstrated poor judgement, lack of integrity or (other) unsuitability for the profession; or evidence that, on the balance of probability, the student had committed such an act;
- (ii) being under the influence of alcohol or drugs while participating in client care, any other professional activity, or any activity related to the practice of the health profession;
- (iii) in accordance with provisions of the Nova Scotia Human Rights Act, the occurrence of a health condition that impairs essential performance required for the health profession;
- (iv) unethical behaviour as specified by the code of ethics/standard of practice of the health profession.

The student's situation will be considered with discretion throughout the investigation of the allegation of unsuitability and these deliberations shall determine whether suspension, dismissal or neither is recommended. The principles of natural justice and due process will be observed in all investigations.

Any member of the University community can bring to the attention of the Director behaviours that are deemed unsuitable. These behaviours will be investigated and allegations heard.

Appeals will follow the appeal procedure for academic matters within the Faculty of Health Professions notwithstanding that the criteria are different. At the University level, appeals will require formation of an *ad hoc* Senate Committee.

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.

A. 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.

B. 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.

C. 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.

Academic Regulations

These regulations apply to all students in the College of Arts and Science and the Faculties of Architecture, Computer Science, Engineering, Health Professions and Management. Students in the Faculties of Architecture, Computer Science, Engineering and Health Professions should also consult the regulations specific to their school, faculty or college found in the appropriate sections of this calendar.

PLEASE NOTE:

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, pg. 27), 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.

It is a student's responsibility to maintain documentation of registration and subsequent changes. For environmental and financial reasons, the Office of the Registrar 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 Undergraduate Committee on Studies in the Faculty of Health Professions, the Undergraduate Academic Appeals Committee in the Faculty of Management, the Academic Appeals Committee in the Faculty of Engineering, the Appeals Committee in the Faculty of Computer Science and the Dean's Office in the Faculty of Architecture.

2. Faculties/Colleges

2.1 College of Arts and Science

- Biochemistry (also in the Faculty of Medicine)
- Biology
- Chemistry
- Classics
- Comparative Religion
- Earth Science
- Economics
- English
- French
- German
- History
- Mathematics, Statistics and Computing Science
- Microbiology and Immunology (also in the Faculty of Medicine)
- Multidisciplinary Studies Centre
- Music
- Oceanography
- Philosophy
- Physics
- Political Science
- Psychology
- Russian Studies
- Sociology and Social Anthropology
- Spanish
- Statistics
- Theatre
- Women's Studies

2.2 Faculty of Architecture

- Architecture

2.3 Faculty of Computer Science

- Computer Science

2.4 Faculty of Engineering

- Biological
- Chemical
- Civil
- Electrical & Computer
- Industrial
- Mechanical
- Mining and Metallurgical
- Engineering Mathematics
- Food Science and Technology

2.5 Faculty of Health Professions

- Nursing
- Occupational Therapy
- Pharmacy
- Physiotherapy
- Health and Human Performance
- Social Work

2.6 Faculty of Management

- Business Administration
 - Commerce
 - Management
- 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.

An example of a class identifier is as follows: ENGL - 1000.06R

ENGL subject code
1000 class number & level
06 credit hours
R session in which the class is taught

The letters A and B denote classes given in the first and second terms respectively. The letter R denotes a class spread over both terms (i.e., given for the full academic year). 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 a class continuing for seven weeks.

Classes with numbers below 1000 normally do not carry credit.

3.2 Academic Advice

At Dalhousie academic advice is available to all students 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 department/school/college. Students complete and submit the Registration and Class Selection Form to the Registrar's Office.

4. Workload

4.1 Regular Year

4.1.1

College of Arts and Science

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 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 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, earned a sessional GPA of less than 3.00.

NOTE: University Exploration students may take a maximum of 4 full-credits per academic year.

4.1.2 School of Business

Five and one-half full credits per academic year in the first and fourth years, five full credits per academic year in the second and third years, will be regarded as constituting a normal workload for the BCom Co-op student.

During the work term, the work assignment shall constitute the normal workload.

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 for more than one half credit per term, nor to any student who is in his/her first year of study or who, in the preceding academic term, earned a sessional GPA of less than 3.00 on a full load of classes.

4.1.3 Faculties of Architecture, Computer Science, Engineering and Health Professions

For normal workloads, 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 3.00.

Note that the co-op summer session and the DalTech summer session are regular academic terms.

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 the Faculty of 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 sessional and cumulative GPA at the end of the next regular academic year. A sessional GPA is not calculated for the spring and summer session.

5. Registration

5.1 Registration material will be sent to all eligible students. Students are strongly encouraged to register by mail. Students admitted late must register in person.

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.

ID cards are mandatory and must be presented to write an officially scheduled examination. In addition, some services such as the issuance of bursary or scholarship cheques, library privileges and Dalplex require the presentation of a valid Dalhousie ID.

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" and "R" classes 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.

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 Health and Human Performance, these are signed by the Undergraduate Associate Director, not by the Director,) in the School of Business Administration, by the Director, Academic Programmes and in the Faculty of Architecture by the Academic Coordinator. No change is effective until a class change form is received by the Office of the Registrar.

Please note that dropping or changing classes may affect your eligibility for student aid.

6.2 Withdrawal

Non-attendance does not, in itself, constitute withdrawal. Withdrawals are not effective until written 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 withdrawal has been approved.

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 22.

7.1 College of Arts and Science

For the Honours degree, a minimum of ten 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 ten 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 7.5 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 BCom Co-op degree a minimum of ten (10) new full credits must be taken, of which at least eight (8) 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.

7.4 Architecture

For the BEDS degree, a minimum of one third of the credits required for the degree must be taken while registered in the BEDS programme.

7.5 Computer Science and Engineering

For the BCS and BEng degrees, a minimum of seven new credits must be taken.

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 the approval of the appropriate department/school/college. For classes not within the purview of a Dalhousie department/school/college, the Registrar's Office 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 Architecture

For the BEDS degree, at least one third of the credits required for the degree, i.e. the last two terms must be completed at Dalhousie.

8.3 Computer Science

For the BCS degree, at least seven credits must be taken at Dalhousie.

8.4 Engineering

For the BEng degree, at least seven credits, including the final two study terms with a full class load, must be taken at Dalhousie.

8.5 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 BIOL 2101.03 and BIOL 4321.06. These classes are to be included within the 10 full credits which the Dental Hygiene students are eligible to receive as credit towards a BSc or BA degree upon completion of the current diploma requirements.

8.6 No Transfer Credits

No credit will be given for any work used as the basis of 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. College of Arts and Science and Management classes that are more than ten (10) years old may not be used to fulfil degree requirements unless a waiver is granted. See Regulation 17, page 27 for information on other faculties.

No classes taken at another institution will be counted towards fulfilment of the major, advanced major or honours requirement of the Bachelor's degree without specific advance approval from the appropriate department/ school/ college at Dalhousie.

No credit will be given for any classes taken at another university while a student is not in good standing at Dalhousie.

8.7 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 time 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/ school/ college to determine how the transfer credits will fit into the student's specific academic programme at Dalhousie.

8.8 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 and the student is in good academic standing. 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:

- The student is registered and has paid fees as a full-time student at Dalhousie,
- The classes are approved as part of the student's programme, and
- The class is not part of a spring/summer school programme.

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 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, regulation 8.1 above 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 on 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 Health and Human Performance, the Maritime School of Social Work, and the Bachelor of Science (Nursing) programmes for Registered Nurses.

10.4 Faculty of Architecture

The opportunity for part-time study is not available in the BEDS programme.

10.5 Faculty of Engineering

Because of the restriction on the duration of undergraduate studies, (see Regulation 17), the opportunity for part-time study is limited.

10.6 Faculty of Computer Science

Part-time students may be admitted to the Bachelor of Computer Science programme.

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 'W' (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 6 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.

The class may be offered over the regular academic session or for one term only.

A class shall be considered 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 winter 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 formation and content of the class; (b) obtaining from the 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 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 full credit experimental classes (or some equivalent combination of these with half-credit 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 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 Faculty. 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:

- That the equivalent of five credits constitutes a normal year,
- That the function of each programme form part of the Calendar description of each programme,
- That each two-year programme permits students at least one credit of their own choice in each of the second and third years,
- That two-year programmes normally not be exclusively in a single discipline,
- That the normal prerequisite for entry into a departmental one-year or two-year programme be the introductory class of the department in question, or an equivalent that the department 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. Correspondence and Summer School Classes Taken at Other Universities

14.1 Faculty of Health Professions

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. 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.

See section 8.5 for information on classes taken at other institutions on letter of permission.

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 schedule from the Office of the Registrar, Dalhousie University.

15. International/Exchange Programmes

The College of Arts and Science, the Faculty of Management and the Schools of Health and Human Performance, Physiotherapy, and Nursing 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:

- One year of study in Aix-en-Provence in France. Consult the French Department.
- Up to one full year of study at a francophone university in Québec. Consult the Department of French.
- A summer of study in German in the DAAD Summer programme. Up to one full year of study at one of the following locations: Heidelberg, Freiberg, Munich, Dresden. Consult the German Department.
- One term of study at Colegio de España, Salamanca, Spain or Unibe University, Dominican Republic. Consult the Co-ordinator in the Spanish Department.
- One term of study at St. Petersburg State University or the Moscow Pedagogical University. Consult the Administrator of the Russian Studies Programme in the Department of Russian.
- Up to one full year of study in Engineering in the Regional Academic Mobility Programme (RAMP), a trilateral exchange programme for engineering students in Canada, the U.S. and Mexico. Consult the Faculty of Engineering.
- A reciprocal exchange programme with the Chelsea School of Physical Education, Sport Science, Dance and Leisure and the University of Brighton, England. Contact the School of Health and Human Performance.

- (h) Up to one full academic year at one of eighteen (18) universities in the New England States. Consult the Registrar's Office.
- (i) Up to one full academic year at one of the following (Consult the School of Business):
 - Aalborg University, Denmark
 - Brandenburg University, Germany
 - Institute Superior de Commerce International (ISCID), Dunkirk, France
 - Instituto Tecnológico Autónomo de México (ITAM), Mexico
 - Jönköping International Business School, Sweden
 - Jyväskylä University, Finland
 - Royal Melbourne Institute of Technology, Australia
 - Waikato University, New Zealand
 - Yonsei University, Republic of Korea
- (j) Up to one full year of study in a Commonwealth country. Consult the Lester Pearson International.
- (k) A six week clinical practicum for Nursing students at Queen Margaret College, Edinburgh, Scotland. Consult the School of Nursing.
- (l) A five week clinical practical internship for Physiotherapy students in England, Finland, Ireland, Kuwait, Scotland, Sweden or the United States. Consult the School of Physiotherapy.
- (m) For students in the Advanced Diploma in Costume Studies, one term of study at an American institution. Consult the Chair of the Theatre Department.
- (n) Up to one full year of study at Umeå University, Umeå, Sweden. Consult Lester Pearson International.
- (o) A special work/study programme for students to provide them with a placement to complement the theory study in International Development Studies, at the University of Havana, Cuba. Consult the International Development Studies Department.
- (p) One full academic credit during the summer at the Shastri Indo-Canadian Institute, India. Consult the International Development Studies Department.
- (q) One academic term at a participating institution in Ireland, Finland or Germany, in the Canada-European Community Programme for Cooperation in Higher Education and Training. Consult the School of Health Services Administration.
- (r) Canadian-European Community Programme for Cooperation in Higher Education and Training with 24 partners in the European union. Consult the Chemistry department.
- (s) A student exchange programme administered by the Association of Universities and Colleges of Canada (AUCC) provides opportunities for undergraduate students to study in Taiwan. Consult Lester Pearson International.

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 19.4.

16. Preparation for Other Programmes

Work in the College of Arts and Science is a 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 university study, including at least one credit in mathematics, are required for entry to a programme in Architecture. For the mathematics credit, calculus is recommended but a math-based class in Physics, Economics, or Statistics may also be acceptable. For details, see the Faculty of Architecture section page 320.

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, Medicine, and Graduate Studies calendar.

Dentistry: See the Dentistry, Law, Medicine, and Graduate Studies 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.

Law: At least two years of work leading to one of the degrees of BA, BSc, BCom. For details, please see the Dentistry, Law, Medicine and Graduate Studies calendar.

Medicine: A BA, BSc, or BCom degree. For details, see the Dentistry, Law, Medicine, and Graduate Studies calendar.

Occupational Therapy, Physiotherapy, Pharmacy, and Social Work: One year of work in the College of Arts and Science, or the equivalent elsewhere, is required for admission to these four programmes. For details, see the Admissions Information section of this calendar.

Veterinary Medicine: The equivalent of twenty, one-semester classes (two years of university study) are required for admission to the Atlantic Veterinary College of the University of Prince Edward Island. Credits must include two Mathematics classes, including Statistics; four Biology classes, including Genetics and Microbiology; three Chemistry classes including Organic Chemistry; one Physics class; two English classes, including one with an emphasis on writing; three Humanities and Social Sciences classes; five electives from any discipline.

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 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 Health and Human Performance 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.

17.3 Faculty of Architecture: Students in the BEDS programme are normally required to complete their degree within four calendar years.

17.4 Faculty of Computer Science: Students in the BCS degree programme are normally required to complete their degree within 8 years.

17.5 Faculty of Engineering: Students in the BEng degree programme are normally required to complete their degree in a period of not more than four consecutive years from the date of first registration in Term 5.

18. Assessment

18.1 Method

Examinations may be oral, written (closed or open book) under supervision, or take-home.

Students will be provided with a class outline by the instructor at the first meeting of the class. In order to complete a class satisfactorily, a student must fulfil all the requirements as set down

in the class outline. Changes to the outline which affect assessment components, the weight of individual assessment components, or examination requirements with a value of ten percent or more must have the approval of at least two-thirds of enrolled students in order to be valid.

Within four weeks after the beginning of each term, class outlines will be placed on file with the appropriate department/school.

18.1.1 Academic Accommodation for Students with Learning Disabilities

See University Regulations, Procedures for Students with Learning Disabilities (pg. 17).

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 to mid-November and mid-February to 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 first 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.

18.2.1. College of Arts and Sciences, Faculties of Architecture, Computer Science, Engineering, Health Professions and Management

No written tests or examinations, with the exception of project presentations and major papers, worth more than 25% of the final grade may be held in the last two weeks of a term, without the explicit approval of the appropriate Faculty, School or College. 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 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.

18.4 Incomplete

Students are expected to complete class work by the prescribed deadlines. Only in special circumstances (e.g. the death of a close relative) may an instructor extend such deadlines. Incomplete work in a class must be completed by:

Fall term classes (A)	Feb 1
Winter and Regular term classes (B or R)	June 1
Spring term classes (A, B, or R)	Aug 1
Summer term and Commerce Co-op/DalTech Summer Session classes (A, B, or R)	Oct 1

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 consists of

- BIOL 4800.06, 4806.03, 4807.03, 4808.03, and 4900.06
- HEED 1495.02, 1595.02;
- LEIS 4496.06;
- MUSC 3470.03 and 4470.03;
- NURS 2220.06, 3240.03 and 3250.03;
- OCCU 2221.00, 3319.00, 3321.00, and 4420.00;
- PHAR 3000.00;
- PHSE 3398.06, and 3402.06;
- PHYT 2500.00, and 3500.00.
- SLWK 2001.06, 3020.06, 4020.15, and 4030.12;

Students taking any of these classes in their final year should note that they will not be able to graduate at the spring convocation.

The Office of the Registrar is not permitted to accept a late clearance of INC or late grade changes other than those due to errors. If there are exceptional circumstances, a recommendation should be forwarded to the undergraduate coordinator or the Committee on Studies of the appropriate Faculty/School. Unless INC is changed it counts in the GPA and has a grade point value of 0.00 - it is a failing grade.

18.5 Supplementals

Faculties of Architecture, Engineering and Health Professions

In classes where supplementals are available, a student must have achieved a grade of "FM" in the class in which the supplemental is to be written.

On re-examination the grade awarded for the class will be recorded on the student's transcript along with a notation that the grade was earned by supplemental examination. In the Faculty of Health Professions, the highest grade that can be awarded is C for professional classes and D for other classes. Although both the original and supplemental grades are recorded on the transcript, only the supplemental grade will be included in the grade point average. Supplemental exams will be administered by the participating Faculty/school/college. Students should check directly with their Faculty/school/college for detailed information on the awarding of FM grades and eligibility for supplemental examinations.

18.6 Correction of Errors in Recorded Grades

Students must request correction in the calculation or recording of final grades by March 1 for first-term grades, July 1 for second-term grades, Sept 1 for spring session grades and Nov 1 for summer term grades and grades for the co-op summer session.

18.7 Reassessment of a Final Grade

Students who have questions about final grades that are assigned are encouraged to discuss them with the class instructor. In addition, students may consult the Chair of the Department, Director of the School/College, Dean of the Faculty, the Student Advocate or the Ombud. If their concerns cannot be resolved, students may also use the formal process that follows for the re-assessment of final grades.

Once a final class grade has been submitted to the Registrar, a student who wishes to have a final grade re-assessed should make a written request to the Registrar and pay the requisite fee of \$50.00. The request must identify the specific component which the student wishes re-assessed and the grounds for the request. Such requests must be made by March 1 for first-term grades, July 1 for second-term grades, Sept 1 for spring session grades and Nov 1 for summer session grades and for the co-op summer session. When such a request is received, the Registrar will forward it to the Dean of the Faculty or Director of the School/College offering the class. The re-assessment will be conducted according to procedures developed for the purpose by the Faculty or School/College. These should reflect the nature of the academic disciplines and assessment involved, and should provide for a review of the assessment by a qualified person or persons not responsible for the original evaluation

The student will be notified, by the Office of the Registrar, of the outcome of the re-assessment. If the re-assessment results in the assignment of a grade that is different (higher or lower) from the original one, the new grade will replace the original one and the \$50.00 will be refunded.

Students who wish information about grade re-assessment procedures should contact their Faculty or School/College office.

18.8 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 fulfil 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" and "B" classes for the Regular session. For the Spring and Summer (including the Coop Summer and DalTech 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, college or faculty.

NOTE: Any student whose request for special arrangements has been denied and wishes to appeal, should refer to Appeals, Academic Regulation 26 (pg. 30).

19. Academic Standing

Students' academic standing is normally assessed at the end of the Regular session.

3Comm Co-op students will be assessed after two consecutive academic terms or after a single academic term which is followed by a work term.

In the Faculties of Computer Science and Engineering students are assessed after each study term.

In the Faculty of Architecture, BEDS students are assessed annually at the end of the Summer Session.

Students entering the College of Pharmacy in 1997 or later are on a pass/fail grading system and should consult the College of Pharmacy for information on academic standing, probation and dismissal.

19.1 Grade Scale and Definitions

Grade	Grade Point Value	Definition	
A+	4.30	Excellent	Considerable evidence of original thinking; demonstrated outstanding capacity to analyze and synthesize; outstanding grasp of subject matter; evidence of extensive knowledge base.
A	4.00		
A-	3.70		
B+	3.30	Good	Evidence of grasp of subject matter, some evidence of critical capacity and analytical ability; reasonable understanding of relevant issues; evidence of familiarity with the literature.
B	3.00		
B-	2.70		
C+	2.30	Satisfactory	Evidence of some understanding of the subject matter; ability to develop solutions to simple problems; benefiting from his/her university experience.
C	2.00		
C-	1.70		
D	1.00	Marginal Pass	Evidence of minimally acceptable (except in programmes where a minimum grade of 'C' is required; familiarity with subject matter, critical and analytical skills.
FM	0.00	Marginal Failure	Only available in professional faculties.
F	0.00	Inadequate	Insufficient evidence of understanding of the subject matter; weakness in critical and analytical skills; limited or irrelevant use of the literature.
INC	0.00	Incomplete	
W	Neutral and no credit obtained	Withdrawn after deadline	
ILL	Neutral and no credit obtained	Compassionate reasons, illness	
P	Neutral	Pass for credit classes	
T	Neutral	Transfer credit on admission	

19.1.1 Grade Point Average (GPA)

The Grade Point Average is calculated by summing the values obtained by multiplying the credit points obtained in each class in accordance with the scale in 19.1, by the number of credit hours of each class then dividing that sum by the total credit hours attempted. A Sessional GPA includes only those classes attempted in the regular and prior spring/summer sessions; and the Cumulative GPA includes all classes attempted while registered for the current degree or carried forward from a previous degree.

19.2 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 and the sessional GPA for the next regular academic session. A sessional GPA will not be calculated for spring and summer sessions.

NOTE: The Coop Summer Session and the DalTech Summer Session are regular academic sessions, i.e. Sessional and cumulative GPA's are calculated at the end of these sessions.

19.3 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.

19.4 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.

19.5 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.

20. Probation

20.1 College of Arts and Science

20.1.1 Students with a cumulative GPA of less than 1.70 and greater than or equal to 1.00 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 their sessional GPA is at least 1.70. Students will be returned to "good standing" when they achieve a cumulative GPA of 1.70. Students on probation who do not achieve a sessional GPA of 1.70 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 their sessional GPA is at least 1.70. Students will be returned to "good standing" when they achieve a cumulative GPA of 1.70. Students who do not achieve a sessional GPA of at least 1.70 will be dismissed academically for the second time for a 36-month period.

20.1.4 Students require a cumulative GPA of 1.70 to graduate. Therefore, no one will be allowed to graduate while on probation.

20.2 Faculties of Architecture, Computer Science, Engineering, Health Professions and Management

20.2.1 Students with a cumulative GPA of less than 2.00 and greater than or equal to 1.70 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 their sessional GPA is at least 2.00. Students will be returned to "good standing" when they achieve a cumulative GPA of 2.00. Students on probation who do not achieve a sessional GPA of 2.00 will be academically dismissed.

20.2.3 Students require a cumulative GPA of 2.00 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 1.00 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 1.70 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 - Faculties of Architecture, Computer Science, Engineering, Health Professions and Management

21.2.1 Students with a cumulative GPA of less than 1.70 who have completed at least four full credits will be academically dismissed for a 12-month period.

NOTE: BCS students who fail more than one Work Term will also be dismissed.

21.2.2 Students on probation who do not achieve a sessional GPA of 2.00 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 for the first time and have subsequently been re-admitted after an absence of a 12-month period may re-register on probation.

21.2.5 Faculty of Health Professions students who have been academically dismissed twice will not be allowed to apply for re-admission.

21.2.6 Faculty of Engineering students who have been required to withdraw for a second time will not be readmitted to any engineering programme at Dalhousie.

21.2.7 Faculty of Computer Science students may be readmitted to the programme only once.

21.2.8 Faculty of Health Professions - Suspension or Dismissal from a Programme on the Grounds of Professional Unsuitability, University Regulations page 30.

22. Graduation Standing

Note that students entering the college of Pharmacy in September 1997 or later should consult the College of Pharmacy for information on graduation and scholarship standing.

22.1 Minimum Cumulative GPA

22.1.1 A minimum cumulative GPA of 1.70 is required for the awarding of a degree in the College of Arts and Science except for Honours programmes. Please see the Degree Requirements section for details on Required Standing for Graduation in Honours programmes.

22.1.2 A minimum cumulative GPA of 2.00 is required for the awarding of an undergraduate degree in the Faculties of Architecture, Computer Science, Engineering, Health Professions and Management.

22.2 Graduation with Distinction

A cumulative GPA of at least 3.70 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 Scholarship Standing

Please see Awards Section, Scholarship GPA (page 414) for information on the GPA required for scholarship purposes.

23. Graduation

In order to graduate students must submit an Intention to Graduate Form to the Office of the Registrar by the deadlines indicated below:

Graduation Month	Deadline
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 submitting an admissions application to the Office of the Registrar by September 25.

25. Deans' Lists

25.1 College of Arts and Science and Faculties of Architecture, Computer Science, Engineering, and Management

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 3.70 in the last five credits or equivalent credit hours will be placed on the Dean's List of the Faculty. The notation "Dean's List" will appear on the student's transcript. Normally, fewer than fifteen percent of students are on the Deans' Lists.

25.2 Faculty of Health Professions

For those programmes enrolling full-time students, the Dean's list will be considered annually on a minimum (and no maximum) number of credits designated by the School/College as a normal yearly workload. Students who have achieved a sessional GPA of 3.70 in the normal yearly workload will be placed on the Dean's List of the Faculty. For those programmes where there are part-time students, see 25.1 for the method used. The notation "Dean's List" will appear on the student's transcript.

Note that students entering the College of Pharmacy in September 1997 or later should contact the College of Pharmacy for information on eligibility for the Dean's list.

25.3 Sexton Scholar List

Students in the Faculties of Architecture, Computer Science, and Engineering who have taken a full class load, as determined by the Faculty and achieved a cumulative GPA of 4.00 will be placed on the Sexton Scholar List. The notation "Sexton Scholar" will appear on the transcript.

26. Appeals

26.1 Appeals for Students with Learning Disabilities

Appeals by students with learning disabilities will follow the usual procedures of the relevant Faculty at Dalhousie University. See University Regulations, Procedures for Students with Learning Disabilities (pg. 17).

26.2 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 Faculty/School regulations must complete an "Application for a

Waiver of an Academic Regulation" form, available in the Registrar's Office. The arguments and expectations of the petitioner must be clearly stated.

An appeal from a student, arising from a required withdrawal from the faculty should be addressed to the Assistant Dean of the appropriate Faculty for students in the College of Arts and Science or the Director of Academic Programmes in the School of Business.

Students who wish to appeal on matters other than those dealt with by College or Faculty regulations should consult with the Faculty/School or Registrar's Office.

The document "Academic Appeals at Dalhousie University" is available in the Registrar's Office.

26.3 Faculty of Architecture

Appeals should be directed to the Office of the Dean.

26.4 Faculty of Computer Science

Appeals should be directed to the Appeals Coordinator.

26.5 Faculty of Engineering

Appeals should be directed to the Academic Appeals Committee.

26.6 Faculty of Health Professions

Committee on Studies (Appeal Procedures)

The Faculty Committee on Undergraduate Studies (hereinafter referred to as the Committee) is a standing committee of the Faculty of Health Professions. The Committee is concerned with the interpretation and application of the academic regulations of the Faculty of Health Professions. The jurisdiction of the Committee is to hear academic appeals beyond the School/College level when the approved appeal regulations and procedures of the respective School/College have been fully exhausted by the student. Decisions of the Committee may be appealed to the Senate Academic Appeals Committee.

The Committee has no jurisdiction to hear student appeals on a matter involving a requested exemption from the application of Faculty or University regulations or procedures, except when irregularities or unfairness in the application thereof is alleged. This means that only procedural issues, and not the merits of the case, are subject to appeal.

Appeals

The Committee hears appeals pertaining to the application of regulations of the Faculty and its Schools and College. The Committee does not hear appeals of a grade or plagiarism/academic discipline. (For regulations pertaining to reassessment of a grade or plagiarism, see elsewhere in the current Calendar)

Procedures

- 6.1 The purpose of these procedures is to assist in the orderly, fair and expeditious resolution of appeals to the Committee. If any party to an appeal fails to comply with these procedures or with any request for information after having been given a reasonable opportunity to do so, the Committee may, at its discretion, deal with the appeal without the benefit of that information. Only written appeals will be heard by the Committee and the appeal must be received in the Office of the Dean of the Faculty of Health Professions within 15 calendar days of the notification of the decision giving rise to the appeal.
- 6.2 The appeal must contain:
 - the name of the student
 - a mailing address certified by the student as well as a telephone number and e-mail address (if applicable)
 - a statement by the appellant that School/College authorized appeal procedures have been exhausted
 - a description of the matter under appeal
 - a statement of the decision being sought
 - a statement as to whether or not a personal hearing before the Committee is requested

- 6.3 the Dean (or her/his designate) will forward the appeal to the Chair of the Committee who will then set the earliest possible date for the meeting or hearing and give reasonable notice of that date.
- 6.4 the student may be accompanied by a lay advocate.
- 6.5 it is the responsibility of each party to the appeal to present to the Committee all relevant information and submissions that it wishes to bring forward.
- 6.6 at the request of the Committee, the Chair may require the School/College to provide a written statement of position on the appeal by the Chair of the School/College Committee on Studies.
- 6.7 the Committee may solicit additional information, consider relevant evidence and submissions from other sources, and act upon these provided that the parties to the appeal are apprised of the additional evidence, submissions or information, with an opportunity to respond.
- 6.8 after hearing the appeal, all parties except the Committee will leave. The Committee will then deliberate in camera to reach its decision. The decision will be by simple majority and recorded in writing. Dissenting voters may have their written reasons attached to the decision.
- 6.9 the decision of the Committee will be conveyed to the appellant, the Director of the School/College and the Dean in writing and within 72 hours of the decision.
- 6.10 where the appeal is not upheld, the appellant will also be advised in the notice of the decision of the subsequent procedures for appeal.
- 6.11 a quorum shall consist of five members.
- 6.12 the Committee shall keep written minutes of its meetings and correspondence filed in the office of the Dean of the Faculty of Health Professions.

Please contact the School/College or Dean of Health Professions Office for the complete terms of reference for the Committee on Undergraduate Studies and the Application regarding Academic Appeals.

School/College Committee on Undergraduate Studies, Terms of Reference for Appeals

The process of appeal is initiated by the student. A student may appeal to the School/College Committee on Studies (hereinafter referred to as the Committee) when the informal process has not resolved the issue and when s/he feels that there has been an irregularity or unfairness regarding the application of a regulation concerning academic matters. For example: evaluation, academic or clinical work, waiver of regulations, other regulations and policies of the school/college.

Informal Process

In the first instance, the student is expected to attempt to resolve the matter informally with the faculty member, preceptor or clinical/fieldwork supervisor with whom the issue of appeal has originated. This should be done within 15 days of the alleged unfairness or irregularity.

Faculty members will make every reasonable effort to resolve the student's concern within the specified time frame (15 days). It is to be understood that faculty members have an obligation to participate as required in both the informal and formal appeal procedures. In most cases it is expected that the matter can be resolved through an informal meeting.

If no resolution arises from this meeting(s), the student may initiate a formal appeal.

In unusual or special circumstances, a student will be permitted to initiate a formal appeal without first attempting to resolve the matter informally. The student must file a written request to the Chairperson of the Committee stating clearly why an exemption to the informal process is sought. The Committee will determine whether or not to allow the request. The Committee may consult the faculty member, preceptor or clinical/fieldwork supervisor for information in deciding whether or not to accept an exemption from the informal process.

Formal Process

Authority

The Committee is a standing committee of the School/College Council and the decisions of the Committee shall be final at the School/College level. Decisions of the Committee may be appealed to the Faculty of Health Professions Committee on Undergraduate Studies.

- 3.1 The Committee considers such routine matters as :
- 3.1.1 waiver of the six and ten year rules
 - 3.1.2 application of previously earned credits to a current degree
 - 3.1.3 retroactive registration
 - 3.1.4 retroactive withdrawal
 - 3.1.5 concurrent registration
 - 3.1.6 credit for non-university work (assessed by individual departments)
 - 3.1.7 permission to carry more than a normal workload during the summer as well as regular terms
 - 3.1.8 assessment of credit for classes taken at other institutes
 - 3.1.9 block transfer credit
 - 3.1.10 matters related to illness

Appeals

If the matter giving rise to the appeal cannot be resolved informally, the student may initiate a formal appeal using the following procedures.

In all cases, the principles of natural justice will be followed and all parties involved will be given ample opportunity to present their arguments in a fair and reasonable manner.

If any party to an appeal fails to comply with these procedures or with any request for information after having been given a reasonable opportunity to do so, the Committee may, at its discretion, deal with the appeal without the benefit of such information.

Procedures

- 6.1 The purpose of these procedures is to assist in the orderly, fair and expeditious resolution of appeals.
- 6.2 Requests for appeals shall be made in writing to the Chairperson and the request shall be accompanied by an approved appeal form.
- 6.3 The appeal must include:
- the name of student
 - a mailing address certified by the student as well as a telephone number, facsimile number and e-mail address (if applicable)
 - the exact purpose and nature of the appeal
 - any supporting arguments and evidence
 - any other relevant considerations
 - any supporting letters
 - the expectations of the petitioner
 - a statement as to whether or not a personal hearing before the Committee is requested
 - a statement indicating whether a lay advocate will attend the personal hearing giving the name and affiliation of the lay advocate.
- 6.4 The request must be submitted to the Chairperson of the School/College Committee on Studies within 30 calendar days of the matter giving rise to the appeal.
- 6.5 The student is responsible for preparing all the necessary documentation for his/her appeal.
- 6.6 The student has the right to appear before the Committee and may be accompanied by a lay advocate of his/her choice. An advocate may be a friend, family member, or student advocate representative.
- 6.7 All parties to the appeal have the right to be present at the meeting, hear all supporting data presented, challenge any data presented, and question any individuals who present information through the Chairperson.
- 6.8 In addition to considering all such evidence and submissions, the Committee may consider relevant evidence and submissions from other sources and on its own initiative solicit

additional information and act upon it, provided that the parties are apprised of the additional evidence, submissions and information with an opportunity to respond.

- 6.9 The initial meeting and hearing must be held within 30 days of the start of the formal procedure. Minutes will be taken to record the proceedings and the proceedings are to be confidential. The Chairperson will caution the Committee members against discussing the case with anyone before, during and after the meeting.
- 6.10 Deliberation and decision
- 6.10.1 The material basis for Committee deliberations shall consist of
- all submissions from the parties to the case
 - all information solicited by correspondence between committee members and the parties to the case
 - all information provided in the course of the Committee hearing.
- 6.10.2 After the student's appeal has been heard, all parties, except for the members of the Committee, will leave. The Committee will then deliberate in camera to reach its decision. The decision will be by simple majority and recorded in writing. Dissenting voters may have their written reasons attached to the decision.
- 6.10.3 If the complaint is upheld the Committee shall determine what remedial action is to be applied.
- 6.10.4 If the Committee denies the appeal, the student has the right to appeal to the Faculty of Health Professions (FHP) Committee on Undergraduate Studies and will be informed of this right and of the procedures to be followed.
- 6.10.5 The Chairperson will inform the student of the final decision of the Committee. The student will be given reason(s) for the decision in writing by registered mail within 72 hours of the hearing.
- 6.10.6 All documentation in possession of Committee members shall be returned to the Chairperson and the official records will be kept in the School/College office.

Refer to the Academic Regulations - Appeals section of the Undergraduate Calendar for more information concerning further appeals.

Please contact the School/College or Dean of Health Professions Office for the complete terms of reference for the Committee on Undergraduate Studies and the Application regarding Academic Appeals.

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, 26.1 and 26.2 above.

Degree Options

	One Year Programme	Two Year Programme BEDE ⁶	Three Year Major	Four Year Adv. Major	Four Year Honours
Architecture	—	—	—	—	—
Arts and Social Sciences	—	—	—	—	—
Classics	—	—	BA	BA ⁶	BA ⁶
Comparative Religion	—	—	BA	BA ⁶	—
Contemporary Studies	—	—	—	—	BA ⁴
English	—	—	BA	BA ⁶	BA ⁶
French	—	—	BA	BA ⁶	BA ⁶
German	—	—	BA	BA ⁶	BA ⁶
History	—	—	BA	BA ⁶	BA ⁶
International Development Studies	—	—	BA	BA ⁶	BA ⁶
Linguistics ¹	—	—	BA	BA ⁶	BA ⁶
Music	—	—	BA	—	BA ⁴
Music Instruction	—	—	—	BMus ⁵	—
Philosophy	—	—	BA	BA ⁶	BA ⁶
Political Science	—	—	BA	BA ⁶	BA ⁶
Russian Studies	—	—	BA	BA ⁶	BA ⁶
Sociology & Social Anthropology	—	—	BA	BA ⁶	BA ⁶
Spanish	—	—	BA	BA ⁶	BA ⁶
Theatre	—	—	BA	BA ⁶	BA ⁶
Women's Studies	—	—	BA	BA ⁶	BA ⁴
Costume Studies	—	Diploma	Advanced Diploma	—	—
Computer Science	—	—	—	BCSc (Co-op) ⁵	—
			BA, BSc	BA, BSc ^{2,6}	BA, BSc ^{2,6}
Dentistry	—	—	—	—	—
Dental Hygiene	—	Diploma ¹	—	—	—
Engineering	—	—	—	—	—
Biological Engineering	—	—	—	BEng ⁵	—
Chemical Engineering	—	—	—	BEng ⁵	—
Civil Engineering	—	—	—	BEng ⁵	—
Electrical and Computer Engineering	—	—	—	BEng ⁵	—
Industrial Engineering	—	—	—	BEng ⁵	—
Mechanical Engineering	—	—	—	BEng ⁵	—
Mining and Metallurgical Engineering	—	—	—	BEng ⁵	—
Health Professions	—	—	—	—	—
Arctic Nursing	—	—	—	BScN (Arctic Nursing) ⁵	—
Nursing	—	—	—	BScN ⁵	—
Nursing for Registered Nurses	—	—	BScN	—	—
Outpost and Community	—	—	—	—	—
Health Nursing	Diploma ⁷	—	—	—	—
Pharmacy	—	—	—	BSc(Pharm) ^{1,5}	—
Recreation	—	—	—	BSc(Rec) ^{5,6}	—
Health Education	—	—	—	BSc(HE) ⁵	—
Health Services Admin.	Diploma	—	—	—	—
Kinesiology	—	—	—	BSc(Kln) ⁵	—
Occupational Therapy	—	—	—	—	—
Physiotherapy	—	—	BSc(OT) ¹	—	—
social Work	—	—	BSc(PT) ¹	—	—
Management	—	—	BSW ¹	—	—
Commerce	—	—	—	—	—
Management	—	—	—	BComm (co-op) ⁵	BComm (co-op)
Public Administration	Diploma	—	—	BMgt ⁵	—
Science	—	—	—	—	—
Biochemistry	—	—	—	BA, BSc ^{2,6}	BA, BSc ^{2,6}
Biology	—	—	BA, BSc	BA, BSc ⁶	BA, BSc ⁶
Chemistry	—	—	BA, BSc	BA, BSc ^{2,6}	BA, BSc ^{2,6}
Economics	—	—	BA, BSc	BA, BSc ^{2,6}	BA, BSc ^{2,6}
Earth Sciences	—	—	BA, BSc	BA, BSc ^{2,6}	BA, BSc ^{2,6}
Marine Biology	—	—	—	BA, BSc ^{2,6}	BA, BSc ^{2,6}
Mathematics	—	—	BA, BSc	BA, BSc ^{2,6}	BA, BSc ^{2,6}
Microbiology	—	—	—	BA, BSc ⁶	BA, BSc ⁶
Neuroscience	—	—	—	—	BA, BSc ⁶
Physics	—	—	BA, BSc	BA, BSc ^{2,6}	BA, BSc ^{2,6}
Psychology	—	—	BA, BSc	BA, BSc ⁶	BA, BSc ⁶
Statistics	—	—	BA, BSc	BA, BSc ^{2,6}	BA, BSc ^{2,6}
Meteorology	Diploma ³	—	—	—	—

Notes: See next page

Degree Options Notes:

- 1 - following one year of appropriate university studies
- 2 - Co-operative Education programs are available. These programs include all the work required for the advanced major or honours together with several work terms. At least four to four and one half years are required for completion.
- 3 - following an appropriate bachelor's degree
- 4 - Combined Honours only
- 5 - four year programmes which are not Advanced Major programmes
- 6 - These programmes are also available with a Minor in Business
- 7 - 15 month programme. This programme may not be offered in 1998/99.
- 8 - following 2 years of appropriate university studies. The BEDS is a cooperative education programme.

Degree Requirements

Following is a list of the faculty requirements needed to satisfy degree programmes at Dalhousie University. Details of these requirements can be found on the pages following these lists. Departmental requirements can be found in the appropriate departmental/faculty listing in this calendar. Please note that students must satisfy both departmental and faculty requirements. 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.

Requirements for degree programmes not listed here can be found in the appropriate department/school/college/faculty listing.

BA, BSc Major (3 year)

- First Year
no more than three (3) full credit equivalents of the first five credits taken may be in a single subject
- One credit in a writing class (see 1.2.1., page 38)
- One credit in a single language/humanities subject (see 1.1.1., page 38)
- One credit in a single social science subject (see 1.1.2., page 37)
- One credit in a single life or physical science subject (see 1.1.3., page 37)
- One credit in a single language for Bachelor of Arts (see 1.2.3., page 38)
- One credit in math for Bachelor of Science (see 1.2.2., page 34)
- Minimum of four (4), maximum of eight (8) credits in the major subject beyond the 1000 level, including two (2) credits beyond the 2000 level. Chemistry majors and students enrolled in the combined Diploma in Engineering and 15 credit major programme in Math or Chemistry need take only one credit beyond the 2000 level.

Bachelor of Arts Major - subjects: Classics, Comparative Religion, Economics, English, French, German, Greek, History, International Development Studies, Latin, Music, Philosophy, Political Science, Russian Studies, Sociology and Social Anthropology, Spanish, Theatre, Women's Studies or any of the BSc major subjects.

Bachelor of Science Major - subjects: Biology, Chemistry, Computer Science, Earth Science, Economics, Mathematics, Physics, Psychology, or Statistics.

- Within the last ten (10) credits, complete one (1) credit in each of two subjects other than the major.
- Total credits required above 1000 level - 7
- Total credits required for degree - 15
- Required GPA for graduation - 1.70
- Graduation with distinction - 3.70

Advanced Major Programmes

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. Unlike the Honours degree, the Advanced Major degree may not be adequate for admission to graduate programmes.

BA, BSc Advanced Major (4 year)

- First Year
no more than three (3) full credit equivalents of the first five credits taken may be in a single subject

- One credit in a writing class (see 1.2.1., page 36)
- One credit in a single language/humanities subject (see 1.1.1., page 37)
- One credit in a single social science subject (see 1.1.2., page 37)
- One credit in a single life or physical science subject (see 1.1.3., page 37)
- One credit in a single language subject for Bachelor of Arts (see 1.2.3., page 38)
- One credit in math for Bachelor of Science (see 1.2.2., page 34)
- Minimum of six (6), maximum of (9) credits in the major subject beyond the 1000 level, including three (3) credits beyond the 2000 level.

Bachelor of Arts Advanced Major - subjects: Classics, Comparative Religion, Economics, English, French, German, History, International Development Studies, Philosophy, Political Science, Psychology, Russian Studies, Sociology and Social Anthropology, Spanish, Women's Studies or from any of the BSc Advanced Major subjects.

Bachelor of Science Advanced Major - subjects: Biochemistry, Biology, Chemistry, Computer Science, Earth Sciences, Economics, Marine Biology, Mathematics, Microbiology & Immunology, Neuroscience, Physics, Psychology, or Statistics.

- Within the last fifteen (15) credits, complete one credit in each of two subjects other than the major.
- Total credits required above 1000 level - 12
- Total credits required for degree - 20
- Required GPA for graduation - 1.70
- Graduation with distinction - 3.70

Science Programmes in Co-operative Education

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 the Advanced Major degree.

The following Departments currently offer Co-op programmes: Biochemistry, Chemistry, Earth Sciences, Economics, Marine Biology, Mathematics, Statistics and Computer Science, and Physics. For details of these programmes, consult the Calendar entries for the Departments and the Cooperative Education in Science section, page 105.

BA, BSc Advanced Major Co-op (4 year)

Requirements are as for the regular Advanced Major programme with the addition of the following:

- Four (4) co-op work terms

Advanced Double Major

Students interested in the advanced double major are advised to consult the departments concerned, before enrolling in the programme, to determine when required classes will be offered.

BA, BSc Advanced Double Major (4 year)

- **First Year**
no more than three (3) full credit equivalents of the first five credits taken may be in a single subject
- One credit in a writing class (see 1.2.1., page 36)
- One credit in a single language/humanities subject (see 1.1.1., page 37)
- One credit in a single social science subject (see 1.1.2., page 37)
- One credit in a single life or physical science subject (see 1.1.3., page 37)
- One credit in a single language for Bachelor of Arts (see 1.2.3., page 38)
- One credit in math for Bachelor of Science (see 1.2.2., page 34)

- Minimum of ten (10) and a maximum of thirteen (13) credits in the major subjects beyond the 1000 level are to be in the two allied subjects, with no more than nine (9) and no fewer than four (4) in either, including at least 2 credits beyond the 2000 level in each of the two major subjects.

Bachelor of Arts Advanced Double Major - subjects: see Bachelor of Arts Advanced Major subjects above.

Bachelor of Science Advanced Double Major - subjects: Choose both subjects from the Bachelor of Science Advanced Major subjects above or combine one of the BSc Advanced Major subjects with one of the BA Advanced Major subjects, provided the larger number of Advanced Major credits is in a science subject.

- Within the last fifteen (15) credits, complete one (1) credit in a single subject other than the two major subjects.
- Total credits required above 1000 level - 12
- Total credits required for degree - 20
- Required GPA for graduation - 1.70
- Graduation with distinction - 3.70

Upgrading of a BA or BSc to an Advanced Major

A person who holds a Dalhousie BA or BSc (15 credit) degree may apply through the Registrar's Office for admission to an Advanced Major. 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 status.

Honours Programmes

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 multidisciplinary.

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 multidisciplinary 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 multidisciplinary honours, by an interdisciplinary committee.

NOTE: The last day to apply to an Honours programme is September 25.

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.

BA, BSc Concentrated Honours (4 year)

- **First Year**
no more than three (3) full credit equivalents of the first five credits taken may be in a single subject
- One credit in a writing class (see 1.2.1., page 36)

- One credit in a single language/humanities subject (see 1.1.1., page 37)
- One credit in a single social science subject (see 1.1.2., page 37)
- One credit in a single life or physical science subject (see 1.1.3., page 37)
- One credit in a single language for Bachelor of Arts (see 1.2.3., page 38)
- One credit in math for Bachelor of Science (see 1.2.2., page 34)
- Two credits in a minor subject - not taken within first year, grade must be "C" or better
- Minimum of nine (9), maximum of eleven (11) credits beyond the 1000-level in the honours subject - grade must be "C" or better, otherwise class will not count towards degree.

Bachelor of Arts Concentrated Honours subjects: Classics, Economics, English, French, German, History, International Development Studies, Philosophy, Political Science, Russian Studies, Social Anthropology, Sociology, Spanish, and Theatre or any of the BSc Honours subjects.

Bachelor of Science Concentrated Honours subjects: Biochemistry, Biology, Chemistry, Computer Science, Earth Sciences, Economics, Marine Biology, Mathematics, Microbiology & Immunology, Neuroscience, Physics, Psychology and Statistics.

- Two (2) to four (4) - depending on the number selected in the major subject - elective credits, at least one of which must be in a single subject other than the major or minor.
- 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 examination. Unless pass/fail grading is employed, the grade must be "B-" or better for Honours, and "A-" or better for First Class Honours.
- Required standing for graduation:

Arts and Social Science Subjects require a GPA of 2.70 (3.70 for First Class) on classes in the major and minor.

Science subjects (Biochemistry, Biology, Chemistry, Computer Science, Economics, Earth Sciences, Marine Biology, Mathematics, Microbiology & Immunology, Neuroscience, Physics, Psychology and Statistics) require a GPA of 3.00 (3.70 for First Class) in the major and minor classes.

BA, BSc Combined Honours (4 year)

- First Year
 - no more than three (3) full credit equivalents of the first five credits taken may be in a single subject
- One credit in a writing class (see 1.2.1., page 38)
- One credit in a single language/humanities subject (see 1.1.1., page 37)
- One credit in a single social science subject (see 1.1.2., page 37)
- One credit in a single life or physical science subject (see 1.1.3., page 37)
- One credit in a single language for Bachelor of Arts (see 1.2.3., page 38)
- One credit in math for Bachelor of Science (see 1.2.2., page 34)
- Minimum of eleven (11) credits beyond the 1000-level in two allied subjects, not more than seven (7) nor fewer than four (4) credits being in either of them. Students may, with the approval of the departments concerned, elect a maximum of thirteen (13) credits in two allied subjects with no more than nine (9) and no fewer than four (4) credits being in either of them. Grade must be "C" or better, otherwise, class will not count toward degree.

- Two (2) to four (4) - depending on the number selected in the major subject - elective credits in subjects other than the two offered to satisfy the requirement of the preceding clause.

Bachelor of Arts Combined Honours - subjects: Classics, Contemporary Studies, Economics, English, French, German, History, International Development Studies, Music, Philosophy, Political Science, Russian Studies, Social Anthropology, Sociology, Spanish, Theatre and Women's Studies or any of the BSc Honours subjects.

Bachelor of Science Combined Honours subjects: Biochemistry, Biology, Chemistry, Computer Science, Earth Sciences, Economics, Marine Biology, Mathematics, Microbiology & Immunology, Neuroscience, Physics, Psychology and Statistics. Choose both subjects from the BSc honours subjects listed above or combine one of the BSc honours subjects with one of the BA Honours subjects, provided the larger number of Honours credits is in a science subject.

- Honours Qualifying Examination: see Concentrated Honours programme above for details.
- Required standing for graduation:

Arts and Social Science Subjects require a GPA of 2.70 (3.70 for First Class) on classes in the major.

Science subjects (Biochemistry, Biology, Chemistry, Computer Science, Earth Sciences, Economics, Marine Biology, Mathematics, Microbiology & Immunology, Neuroscience, Physics, Psychology and Statistics) require a GPA of 3.00 (3.70 for First Class) in the major.

BA, BSc Multidisciplinary Honours (4 year)

- First Year
 - no more than three (3) full credit equivalents of the first five credits taken may be in a single subject
- One credit in a writing class (see 1.2.1., page 38)
- One credit in a single language/humanities subject (see 1.1.1., page 37)
- One credit in a single social science subject (see 1.1.2., page 37)
- One credit in a single life or physical science subject (see 1.1.3., page 37)
- One credit in a single language for Bachelor of Arts (see 1.2.3., page 38)
- One credit in math for Bachelor of Science (see 1.2.2., page 34)
- Twelve (12) credits beyond the 1000 level in three or more subjects. No more than five (5) of these may be in a single subject; no less than six (6) nor more than nine (9) may be in two subjects. Grade must be "C" or better, otherwise the class will not count towards degree.

Bachelor of Arts Multidisciplinary Honours - at least ten (10) credits of the twenty selected must be from the following subjects: Classics, Contemporary Studies, Economics, English, French, German, History, International Development Studies, Philosophy, Political Science, Russian, Social Anthropology, Sociology, Spanish, Theatre and Women's Studies or any of the BSc Honours subjects.

Bachelor of Science Multidisciplinary Honours - at least eight (8) credits of the twenty selected must be from the following subjects: Biochemistry, Biology, Chemistry, Computer Science, Earth Sciences, Economics, Mathematics, Microbiology & Immunology, Neuroscience, Physics, Psychology and Statistics.

- Three (3) elective credits.
- Honours Qualifying Examination: See Concentrated Honours programme above for details.
- Required standing for graduation:

Arts and Social Science Subjects require a GPA of 2.70 (3.70 for First Class) on classes in the major.

Science subjects (Biochemistry, Biology, Chemistry, Computer Science, Earth Sciences, Economics, Marine Biology, Mathematics, Microbiology, Neuroscience, Physics, Psychology and Statistics) require a GPA of 3.00 (3.70 for First Class) on classes in the major.

Honours Programmes in Co-operative Education

Co-operative Education programmes are also available for the Bachelor of Arts and Bachelor of Science Honours degrees.

BA, BSc Honours Co-op (4 year)

Requirements are as for appropriate Honours programme (described above) with the addition of the following:

- Four (4) co-op work terms

Upgrading of a BA or BSc to an Honours Degree

A person who holds a Dalhousie BA or BSc (15 or 20 credit) degree may apply through his/her department advisor or, for Multidisciplinary Honours Programmes, the Registrar may be consulted. On completion of the required work with proper standing, a certificate will be awarded which has the effect of upgrading the degree to Honours status.

BA and BSc Programmes with Minor in Business

BA, BSc Advanced Major with Minor in Business (4 year)

- **First Year**
no more than three (3) full credit equivalents of the first five credits taken may be in a single subject
- COMM 1000.03, 1501.03, ECON 1101.03/1102.03
- One credit in Mathematics (for the BSc the mathematics credit must be other than MATH 1001.03/1002.03, 1110.03/1120.03)
- One credit in a writing class (see 1.2.1., page 38)
- One credit in a single language/humanities subject (see 1.1.1., page 37)
- One credit in a single social science subject (ECON 1101.03/1102.03)
- One credit in a single life or physical science subject
- One credit in a single language subject for BA (see 1.2.3., page 38)
- **Required Advanced Commerce classes:**
COMM 2101.03, 2301.03, 2401.03 and 1.5 other Commerce classes above the 1000 level; one (1) Commerce credit above the 2000 level.
- Minimum of six (6), maximum of nine (9) credits above the 1000 level in the major, at least three (3) of which must be above the 2000 level.

Bachelor of Arts Advanced Major - subjects: Classics, Comparative Religion, Economics, English, French, German, History, International Development Studies, Philosophy, Political Science, Psychology, Russian Studies, Sociology and Social Anthropology, Spanish, Women's Studies or from any of the BSc Advanced Major subjects.

Bachelor of Science Advanced Major - subjects: Biochemistry, Biology, Chemistry, Computer Science, Earth Sciences, Economics, Marine Biology, Mathematics, Microbiology & Immunology, Neuroscience, Physics, Psychology, or Statistics.

- Within the last fifteen credits, complete one credit in a single subject other than the major subject or Commerce.
- Total credits required above the 1000 level - 12
- Total credits required for degree - 20
- Required GPA for graduation - 1.70
- Graduation with distinction - 3.70

BA, BSc Honours with Minor in Business (4 year)

- **First Year - first five credits**
no more than three (3) full credit equivalents of the first five credits taken may be in a single subject
- COMM 1000.03, 1501.03, ECON 1101.03/1102.03

- One credit in Mathematics (for the BSc mathematics credit must be other than MATH 1001.03/1002.03, 1110.03/1120.03)
- One credit in a writing class (see 1.2.1., page 38)
- One credit in a single language/humanities subject (see 1.1.1., page 37)
- One credit in a single social science subject (ECON 1101.03/1102.03)
- One credit in a single life or physical science subject
- One credit in a single language for BA (see 1.2.3., page 38)
- **Required Advanced Commerce classes:**
COMM 2101.03, 2301.03, 2401.03 and 1.5 other Commerce credits above the 1000 level; one (1) Commerce credit above the 2000 level.
- Nine (9) credits beyond the 1000 level in the Honours subject - grade must be a "C" or better or credit will not count towards degree.

Bachelor of Arts Concentrated Honours subjects: Classics, Economics, English, French, German, History, International Development Studies, Philosophy, Political Science, Russian Studies, Social Anthropology, Sociology, Spanish, and Theatre or any of the BSc Honours subjects.

Bachelor of Science Concentrated Honours subjects: Biochemistry, Biology, Chemistry, Computer Science, Earth Sciences, Economics, Marine Biology, Mathematics, Microbiology & Immunology, Neuroscience, Physics, Psychology and Statistics.

- Two (2) elective credits, one full credit of which must be in a single subject other than Commerce or the Honours subject.
- Honours Qualifying Examination: see Concentrated Honours programme for details.
- Required standing for graduation:

Arts and Social Sciences Subjects require a GPA of 2.70 (3.70 for First Class) on classes in the major and minor.

Science subjects (Biochemistry, Biology, Chemistry, Computer Science, Economics, Earth Sciences, Marine Biology, Mathematics, Microbiology & Immunology, Neuroscience, Physics, Psychology and Statistics) require a GPA of 3.00 (3.70 for First Class) on classes in the major and minor.

Individual Programmes

In cases where students feel 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 prior to or during the student's second academic year. The Dean shall act as advisor for such students.

1. College of Arts and Sciences

1.1. Subject Groupings in the College of Arts and 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, King's Foundation Year, Latin, Music, Philosophy, Russian, Spanish, Theatre, and Women's Studies.

1.1.2. Social Sciences:

Canadian Studies, Economics, Education, History, International Development Studies, King's Foundation Year, Political Science, Psychology, Sociology and Social Anthropology, and Women's Studies.

1.1.3. Life Sciences and Physical Sciences:

Biochemistry, Biology, Chemistry, Computer Science, Earth Sciences, Economics, Engineering, Mathematics, Microbiology & Immunology, Neuroscience, Oceanography, Physics, Psychology, Science and Statistics.

PLEASE NOTE:

- (1) In cases where a subject is listed in more than one 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. The exceptions are the Dalhousie Integrated Science Programme and King's Foundation Year Programme. King's Foundation Year Programme (KING 1000.24, 1100.18) satisfies the Humanities-Languages and Social Science groupings and students must take a full credit in a single Life / Physical Sciences subject to complete the subject grouping requirements. The Dalhousie Integrated Science Programme (SCIE 1500.30) satisfies the Science and Social Science requirements and students must take a full credit in a single language/ humanities subject to complete the subject grouping requirement.
- (2) The subject groupings requirement should normally be completed in the first ten credits.

1.2.1. Writing Class

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.

- CHEM 1000.06;
- CLAS 1000.06, 1010.06, 1100.06;
- COMR 1301.06;
- ENGL 1000.06;
- GERM 1020.06;
- HIST 1400.06;
- King's Foundation Year;
- MUSC 1010.06;
- PHIL 1010.06;
- POLI 1103.06;
- RUSS 2051.03/2052.03 (both RUSS 2051.03 and 2052.03 must be successfully completed in order to satisfy the Writing Requirement);
- SCIE 1500.30;
- SOSA 1050.06;
- THEA 1000.06.

The Writing Class may also be used to satisfy one of the subject groupings.

Classes which satisfy the Writing Requirement are identified by the following symbol and notation in their format description:

✍ Writing Requirement

PLEASE NOTE: Classes identified as Writing Intensive do not satisfy the Writing Requirement.

1.2.2. Mathematics 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 MATH 1001.03/ 1002.03, MATH 1110.03/1120.03. A class taken to satisfy this requirement cannot also satisfy the requirement of a class from section 1.1.3. Students may also satisfy this requirement by completing the Science Foundation year or passing the test which is administered by the Department of Mathematics, Statistics & Computer Science. Such students must nevertheless complete 15 or 20 credits in order to graduate.

1.2.3. Language Class

Students should consider becoming fluent in French. BA students are required to obtain one credit from the following language classes:

- CLAS 1700.06, 1800.06;
- FRFN (any class)
- GERM 1010.06, 1060.06;
- RUSS 1000.06, 1050.06;
- SPAN 1020.06, 2000.03/2010.03 (both SPAN 2000.03 and 2010.03 must be successfully completed in order to satisfy the Language Requirement)

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 MATH 1001.03/1002.03 or MATH 1110.03/ 1120.03, to meet this requirement; or they may meet it by passing the test administered by the Department of Mathematics, Statistics & Computer Science. A class taken to satisfy this requirement cannot also satisfy the requirement of a class from section 1.1.3.

1.2.4. Cross-listed Classes

Please note that cross-listed classes will count as one subject only for the purpose of satisfying degree requirements, e.g. ECON 2260.03 cross-listed with MATH 2060.03 may count either as part of the Mathematics requirement or as part of a major in Economics, but not both.

1.2.5. Arts and Science Electives

Students may choose electives from any of the classes offered by teaching units within the College of Arts and Science. In addition, without prior permission, the equivalent of one full credit may be chosen from programs offered in other areas provided that any prerequisite requirements are met and that the consent of the instructor(s) concerned is obtained when necessary.

BSc students are permitted to select up to five full credits from Engineering classes as electives without special approval, provided prerequisites are met and space is available in the class.

Students wishing to do so may add up to two elective credits by taking Commerce classes beyond the provisions of the previous paragraph, and those seeking to complete a B.A. or B.Sc. degree with Minor in Business are permitted to select as many Commerce classes as needed to satisfy the Minor requirement for the degree, without special approval in either case.

Any additional elective credits outside of the College of Arts and Science will require explicit permission, to be obtained by application to the appropriate Dean's Office. Permission to count a requested class for degree credit will only be granted to students who demonstrate clearly, in a written submission, how a desired class will enhance the objectives of the B.A. or B.Sc. program in progress. In this regard, a written statement of support from an academic advisor in the major department is desirable.

Students seeking to enrol in classes beyond the above provisions as a means of preparing to transfer to a program of study outside of the College of Arts and Science will be given approval to do so by the appropriate Dean's Office if admission to the class(es) has been granted by the instructor(s) concerned. In such cases, however, it will be explicitly stated that the classes will not count for credit towards a BA or BSc degree.

NOTE: Students enrolling in elective classes must meet normal class prerequisites.

1.3. Bachelor of Music and Bachelor of Music Education

For the special requirements of these degrees, see the entry for the Department of Music.

1.4. Diploma and Advanced Diploma in Costume Studies

Study for these credentials is entirely within the Department of Theatre. See the entry for that department for detailed information.

1.5. 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. Bachelor of Commerce

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) are required for graduation.

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: (all classes are half-credits except those designated as .06, which are full credits)

2.1.1. Required Core Area Classes

The equivalent of ten and a half full credits (twenty-one half credits): COMM 1000.03, 1501.03, 2101.03, 2102.03, 2202.03, 2203.03, 2301.03, 2401.03, 2501.03, 2502.03, 2601.03, 2701.03, 3301.03, 3501.03, 3701.03, 4350.06; ECON 1101.03, 1102.03; MATH 1110.03 and 1120.03, or 1000.03 and 1010.03

NOTE: MATH 1110.03 and 1120.03 are specifically designed for the Commerce programme, and are not normally accepted as the prerequisites for upper level Mathematics or Computer Science classes.

2.1.2. Core Area Electives

The equivalent of three and a half full credits (seven half credits) to be selected from offerings in the core areas of Commerce, Economics and Mathematics (including Computer Science and Statistics). One of these must be a class in Information Systems, selected from a list of approved classes in this area (including some from outside the School of Business Administration) compiled by the School.

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, from all classes offered in the University above the 1000-level.

2.1.5. Work Term Requirements

The equivalent of one and one-half full credits (three half credits); requires the satisfactory completion of three work terms.

Students are expected to ensure that the classes taken comply with the above.

The Bachelor of Commerce Co-op is a structured programme, with most of its classes assigned to specific years and terms. The chart below 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 COMM 1000.03 and 2101.03 will be offered in the Spring and Summer terms, to permit students an opportunity to make up academic deficiencies and proceed to Year II of the Bachelor of Commerce Programme.)

Term	Fall Sept/Dec	Winter Jan/Apr	Co-op Summer May/Aug
Year I	COMM 1000.03 (1) ECON 1101.03 (1) MATH 1110.03 (1) (or MATH 1000.03)	COMM 2101.03 (1) ECON 1102.03 (1) MATH 1120.03 (1) (or MATH 1010.03)	Free (students with less than 5 1/2 credits should enrol in the appropriate class(es))
	COMM 1501.03 (1) 2 Non-commerce electives (4)		
Year II	COMM 2102.03 (1) COMM 2202.03 (1) COMM 2401.03 (1) COMM 2501.03 (1) COMM 2701.03 (1) Seminar	Work Term(1)	COMM 2203.03 (1) COMM 2301.03 (1) COMM 2502.03 (1) COMM 2601.03 (1) COMM 3701.03 (1)
Year III	Work Term(1)	COMM 3301.03 (1) COMM 3501.03 (1) 3 Core Electives(3)	Work Term(1)
Year IV	COMM 4350.06 (2) 4 Core Electives (4) 3 Free Electives (3) 2 Non-Commerce Elective (2)		

* Student's academic standing will be assessed at the end of this academic term (see Section 20, 21 and 22, Academic Regulations).

2.1.6. 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 COMM 1000.03: Introduction to Business and COMM 2701.03: Business Communication.

The School recommends, but does not require, that students take at least one class 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 identified by the following symbol and notation in their format description:

W Writing Requirement

PLEASE NOTE: Classes identified as Writing Intensive do not satisfy the Writing Requirement.

2.2. Bachelor of Management

The School of Business Administration will be offering a non cooperative education management degree. Requests for information should be forwarded to the administrative office of the School of Business Administration at (902) 494-7080.

2.3. School of Public Administration

Please refer to the Public Administration entry in this calendar

3. Faculties of Architecture, Computer Science, Engineering, and Health Professions

For degree requirements in the Faculties of Architecture, Computer Science, Engineering and Health Professions, refer to the entry in this calendar for the appropriate faculty, school or college.

College of Arts and Science

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
Taylor, G.D. PhD (Penn)

Introduction

The College of Arts and Science, established in 1988, consists of the Faculty of Arts and Social Sciences and the Faculty of Science. 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. There are thirteen Departments in the Faculty of Arts and Social Sciences, and eleven Departments in the Faculty of Science. 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, and Bachelor of Music degree programmes, and for diploma programmes in Meteorology and Costume Studies. 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 6,000 undergraduate students who typically spend three or four years in the College, nearly 450 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 classes. Frequently Honours students obtain this grade by successfully completing an original research project under

Faculty of Architecture

Location: 5410 Spring Garden Road
Halifax, NS

Mail: Faculty of Architecture
DalTech
Dalhousie University
P.O. Box 1000
Halifax, NS B3J 2X4

Telephone: (902) 420-7692
Fax: (902) 423-6672

E-mail: Arch.Office@Dal.Ca
WWW: www.dal.ca/architecture

Interim Dean

Emodi, T., BArch (Melbourne), MES (York), MRAIC
Telephone: (902) 420-7693

Head, Department of Urban and Rural Planning

Guppy, S., BSc (Nottingham), MSc, PhD (Wales), MArch
(Columbia), MRAIC
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Academic Coordinator, School of Architecture

Parcell, S., BArch (Toronto), MArch (Cranbrook)
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Administrative Assistant

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Telephone: (902) 420-7512

Departmental Secretary - Architecture

Conrad, S., BA, BEd, MEd (SMU)
Telephone: (902) 420-7692

Departmental Secretary - Planning

Leslie, D., BA (MSVU)
Telephone: (902) 420-7570

Co-op Coordinator for Architecture

Costello, P., BEDS, BArch (TUNS), MRAIC
Telephone: (902) 420-7972

Introduction

The Faculty of Architecture includes the School of Architecture and the Department of Urban and Rural Planning. The Faculty's degree programmes are intended primarily for individuals who intend to become professional architects or planners. A student may apply to enter the Faculty of Architecture's BEDS programme after completing two years of university study in any discipline. The Faculty also offers several classes that are open to all students in the university. For a summary of these classes, please see the "Architecture" section in this calendar. For a full description of programmes offered by the Faculty of Architecture, please see the "Architecture" and "Urban and Rural Planning" sections in the Dalhousie Graduate Studies calendar.

Please refer to the DalTech section of this calendar for information on programmes offered by this Faculty.

Faculty of Arts and Social Sciences

Location: Arts & Administration Building
Third Floor
Halifax, NS B3H 4H6

Telephone: (902) 494-1440
Fax: (902) 494-1957

Dean

Taylor, G.D., BA, PhD (Penn), Professor of History
Telephone: (902) 494-1439

Associate Dean

Thiessen V., BA (Man), MA, PhD (Wis), Professor of Sociology and Social Anthropology
Telephone: (902) 494-1254

Assistant Dean (Students)

Konok, H., BA (Tor), MA, MAT (Dal), Lecturer French Department
Telephone: (902) 494-1440

Assistant Dean (External)

Neville, C.J., BA, MA (Carleton), PhD (Aberdeen), Associate Professor of History
Telephone: (902) 494-6912

Secretary

Farrell, D.M., BA (St. Norbert Col.), MMus, PhD (Wisc.), (Theory and Composition) Professor of Music
Telephone: (902) 494-2420

Administrator

Miller, D.G., BCom (Acadia), CFP
Telephone: (902) 494-1441

A. Introduction

The Faculty of Arts and Social Sciences consists of those 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 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 the Faculty 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.

B. Departments and Programmes of the Faculty of Arts and Social Sciences

- Canadian Studies
- Classics
- Comparative Religion
- Contemporary Studies
- English
- French
- German

- History
- International Development Studies
- Music
- Philosophy
- Political Science
- Russian Studies
- Sociology and Social Anthropology
- Spanish
- Theatre
- Women's Studies

Faculty of Computer Science

Location: "MC" Building
1505 Barrington St.
Halifax, NS B3J 3K5

Telephone: (902) 494-2093

Fax: (902) 492-1517

WWW: www.cs.dal.ca

Dean

Slonim, J., BSc, MSc (Western), PhD (Kansas)

Administrative Assistant to the Dean

Publicover, A., BSc (Dal), BA (Dal) Telephone: 902-494-1199

Departmental Secretary - Undergraduate

Poirier, C., BA (Acadia) Telephone: 902-494-2407

Departmental Secretary - Graduate

Steyer, U. Telephone 902-494-2093

I. Introduction

Computer Science is a core high-technology discipline and an integral and indispensable part of technical education. The mission of the Faculty of Computer Science is to provide excellent teaching to our students and to conduct research of the highest quality in specific areas within Computer Science, with emphasis on major research programs with Industry's support and participation. The major research foci will be Network Centered Computing and Software Engineering.

The Faculty was formed on April 1st, 1997, following the amalgamation of the Technical University of Nova Scotia and Dalhousie University. Its members came from the School of Computer Science at TUNS and the Computing Science Division of the Department of Mathematics, Statistics and Computing Science at Dalhousie. The faculty will experience considerable growth over the next few years in all aspects: faculty complement, student enrolment, funding levels and facilities. A new computer science building is planned for August, 1999. We are in the middle of rationalizing our class offerings. The most up to date information will be found on our website: www.cs.dal.ca.

Please refer to DalTech section of this calendar for additional information concerning programmes offered by this Faculty.

Faculty of Engineering

i. Engineering as a Profession

Engineering is one of the most important of the professions. Virtually all aspects of modern life are involved with this fascinating discipline. Engineering education at Dalhousie is demanding, because the engineering profession is demanding. Society expects its technical problem solvers to offer answers to some of the most difficult questions around - questions related to the environment, productivity, communications, transportation, and more. In general, the engineering enterprise contributes not only to human welfare, but also to the sustainable development of our resources. Engineering education provides great rewards for the engineer of the future. Specifically, there is the personal satisfaction of following a career where one's personal expertise can benefit fellow humans and contribute to the making of a better world.

The Faculty of Engineering at Dalhousie University prepares its students with the problem-solving skills needed for lifelong exploration in a field that answers some of today's most pressing concerns. The Faculty of Engineering has an excellent tradition of providing engineering education for students in the Atlantic Provinces that started in 1907 with the founding of the Nova Scotia Technical College. Our graduates can be found in important positions throughout Canada and in many other countries.

The Faculty of Engineering offers undergraduate curricula leading to the degree of Bachelor of Engineering in the following eight disciplines:

- Biological Engineering (including bio-systems and environmental engineering options)
- Civil Engineering
- Chemical Engineering
- Electrical and Computer Engineering
- Industrial Engineering
- Mechanical Engineering
- Metallurgical Engineering
- Mining Engineering

The Faculty also offers post-graduate studies at the master's and doctoral level.

The preparation for an engineering career includes both formal academic studies at a university and intensive training in the practice of engineering. A similar pattern is to be found in preparation for careers in medicine or law, and is characteristic of any development of professional competence. The Co-operative Engineering program in the Faculty of Engineering provides a completely integrated pattern of academic study and industrial experience in various phases of engineering with ultimate graduation requiring satisfactory performance in both areas. All programs are offered in a co-operative format. Electrical and Computer Engineering and Mechanical Engineering both have a co-operative internship. Engineering disciplines offering co-operative programs schedule work periods in industry at various times of the year. This sequencing may vary according to the discipline, details of which are outlined in the curricula in this calendar.

The degree program covers almost five calendar years, comprising eight or nine terms (depending on the area of specialization) each of about four months' duration of university work on campus which are pursued alternately with four-month terms of supervised training in the practical experiences fundamental to the

development of the graduate engineer. In a typical program of study, the total time spent in academic study is the same as that encountered in the usual course of four academic years.

Graduation from the University is only the introduction to an engineering career, and the beginning of a lifelong learning experience. After completion of formal studies leading to the Bachelor of Engineering degree, four years of suitable experience are required as a condition of admission to the profession of Engineering.

The practice of engineering is regulated, by statute, in all Canadian provinces and territories. To become a Professional Engineer you must satisfy the requirements of the licensing bodies. These requirements include a degree from an accredited program, successful completion of a professional practice (law and ethics) examination, and suitable experience. Accreditation of the degree programs by the CEAB is the mechanism by which graduates qualify for registration as Professional Engineers without the need to undertake additional examinations in specific technical subject areas. The B. Eng. programs described in this calendar have been specifically designed to satisfy the criteria of the Profession and are evaluated regularly by the Canadian Engineering Accreditation Board (CEAB) of the Canadian Council of Professional Engineers. The Faculty will not graduate any student who does not meet these requirements because this would jeopardize accreditation for the program. The department responsible for the appropriate program will use these curriculum content requirements in determining the suitability of student elective course selections. The baccalaureate programs in all disciplines are accredited by the Canadian Engineering Accreditation Board.

Please refer to the DalTech section of this Calendar for additional information on programmes offered by the Faculty.

Faculty of Health Professions

Dean

McIntyre, L., MD, MHSc, FRCP(C)

Interprofessional Coordinator

Banks, S., BSc, MA (Dal)

Administrator

Cole, L.J.

Administrative Coordinator

Read, D.H.

Dean's Secretary/Interdisciplinary Course Coordinator

Weir, B.L.

I. Introduction

The Faculty of Health Professions consists of the School of Nursing, College of Pharmacy, School of Health and Human Performance, 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.

Policy Statement on Affirmative Action

The Faculty of Health Professions recognizes that action is required to increase the number of graduates from under-represented Indigenous minority groups of the Maritime and Atlantic Provinces, particularly Blacks and First Nations people. Therefore, the Faculty, through its constituent units, will develop and implement affirmative action policies that are approved by the Human Rights Commission. Further, the Faculty will work to identify and develop recruitment and support systems that will ensure that members of these under-represented groups apply and graduate.

II. Student Disclosure of Health Information - Faculty of Health Professions

Students registered in this Faculty are encouraged to inform both the School/College and the field work learning sites if they have a health concern that has the potential to compromise client, student and/or agency personnel safety and/or has the potential for limiting their ability to learn and perform their role as learner.

For the purposes of this policy, the term health concern refers to any cognitive, affective, and/or physical health problem, injury, or condition that may place the student and/or others at risk and/or inhibit the student's learning ability and performance.

A. Guidelines for Disclosure

The student has the right to decide if disclosure of health information is appropriate. The method, timing and extent of the disclosure is at the student's discretion (for consultation options, see

below). Early disclosure of the following information regarding the health concern may be helpful to students in the academic and/or field work sites.

To disclose this information:

- (1) Clearly describe the nature of the health concern and the potential limitations with regard to the learning tasks expected in either the academic or field work site. Appropriate verification of the information may be required.
- (2) List any adaptations, modifications and/or safety procedures that may be required in planning the student's learning experiences in either setting.
- (3) Provide clear and appropriate advice regarding the management of this health concern.

If the disclosure of health information in field work and/or academic sites produces difficulties, students are encouraged to report these difficulties immediately to the appropriate person(s) within both the field work site and/or within their educational programme (see below). Discrimination in any form will not be tolerated.

Students are advised to make the initial contact with the person with whom they are most comfortable from the lists below. These individuals would be available for consultation/advocacy:

- Academic /faculty advisor
- Field work coordinator(s)
- Director of the School or College where student is enrolled
- Dean of the Faculty of Health Professions
- Advisor to Students with Disabilities, Dalhousie University
- Dalhousie/King's Association of Students with Disabilities
- Human Rights Commission

College of Pharmacy

- Preceptor
- Site coordinator
- Externship administrator

School of Nursing

- Clinical instructor
- Class professor
- Associate Director, Undergraduate Student Affairs
- Coordinator, Outpost and Community Health

School of Occupational Therapy

- Preceptor
- Site director in field site
- Provincial field work coordinator

School of Physiotherapy

- Clinical supervisor
- Facility clinical coordinator
- Provincial coordinator

School of Social Work

- Agency field instructor
- Programme coordinator
- Faculty field instructor

Health Services Administration

- Preceptor

Human Communication Disorders

- Clinical Educator

Health and Human Performance

- Associate Director, Undergraduate Studies

Faculty of Management

Location: 6152 Coburg Road
Halifax, NS B3H 1Z5
Telephone: 494-2582
Fax: 494-1195
WWW: <http://www.mgmt.dal.ca/>

Dean

Rosson, P., Dip MS (Salford), MA (Lancaster), PhD (Bath) -
Address: 6152 Coburg Road
Telephone: 494-2582

Directors

School of Business Administration
Klapstein, R.E., BSc (Calgary), BA (Alberta), MBA, LLB (Dal), LLM
(Osgoode), CGA
Address: 6152 Coburg Road
Telephone: 494-7080

School of Library and Information Studies
MacDonald, B.H., BSc (Acadia), MA, MLS, PhD (Western)
Address: 3621 Killam Library
Telephone: 494-3656

School of Public Administration
Sullivan, K.C., BSc (Dal), BEd (Dal), MEd, PhD (Alberta)
Address: 6152 Coburg Road
Telephone: 494-3742

School for Resource and Environmental Studies
Wood, K.S., BA, MA (Oregon)
Address: 1322 Robie Street
Telephone: 494-3632

I. Introduction

The Faculty of Management includes four schools - School of Business Administration, School of Library and Information Studies, School of Public Administration, and School for Resource and Environmental Studies. Undergraduate programmes are offered in the School of Business Administration in Commerce (BCom) and Management (BMgt), and in the School of Public Administration (DPA). As of September 1991, the Bachelor of Commerce has been changed to a mandatory co-operative education programme. The School will be offering the Bachelor of Management as a non-cooperative education management degree (consult website). 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 of Science

Location: Arts and Administration Building
Third Floor
Halifax, NS B3H 4H6
Telephone: (902) 494-2373
Fax: (902) 494-1123
e-mail: science@dal.ca

Interim Dean

Ryall, P.J.C., BSc (Dal), MSc (Alta), PhD (Dal), Associate Professor
(Earth Sciences)
Telephone: (902) 494-3540

Associate Dean

Sutherland, W.R.S., BSc (MtA), MSc, PhD (Brown), Professor of
Mathematics
Telephone: (902) 494-3421

Assistant Dean (International Programmes)

Ryall, P.J.C., BSc (Dal), MSc (Alta), PhD (Dal), Associate Professor
(Earth Sciences)
Telephone: (902) 494-2964

Assistant Dean (Student Affairs and Space)

Langstroth, G.F.O., BSc (Alta), MSc (Dal), PhD (London), Professor
of Physics
Telephone: (902) 494-2373

Secretary of Faculty

Swaminathan, S., MA, MSc, PhD (Madras), Professor Emeritus
(Mathematics)
Telephone: (902) 494-2373

Administrator

Giddy, A., BA (Dal)
Telephone: (902) 494-1443

Administrative Assistant

Wells, J., BBA (MSVU)
Telephone: (902) 494-3540

Administrative Secretary

Hanna-Shea, D.
Telephone: (902) 494-2373

A. 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 10 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 more of the following areas: biochemistry, biology, biotechnology, chemistry, earth sciences, economics, marine biology, mathematics, meteorology, microbiology, neuroscience, physics, psychology, and statistics. It is possible to combine studies in many of these areas with a minor in business or with a Co-op Education in Science

option. (This requires work placement terms.) Details concerning particular programmes of study are found in the departmental entries.

B. Departments of the Faculty of Science

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

Henson College

Public Affairs and Continuing Education

Dean

Morrissey, M.C., BA (Western), MSW (Dal), MPA (Harvard)

Assistant Dean

Sampson, M., BBA (MSVU)

Professors

Benoit, J., BA, MA (Guelph), PhD (Johns Hopkins)

Fraser, L., BA (MtA), BEd, MEd (Dal)

MacMillan, R., BA, MPA (Dal)

Novack, J., BCom, MPA (Dal)

Associate Professors

Bishop, A., BA (Tor)

Day, L., BBA (MSVU)

Holmes, S., BSA (Acadia), MEd (Dal)

Johnson, B., BA, BSW, MSW (Dal)

MacDonald, G., BBA, BA (UNB), MPA (Dal)

Rans, R., BA (East Anglia), MA (Sheffield), MPA, PhD (Dal)

Sampson, M., BBA (MSVU)

Assistant Professors

Molloy, C., BA (Memorial)

Williams, M.P., BA, MSc (Guelph), MEd (Dal)

I. Introduction

Henson College was established as a senior academic unit at Dalhousie in 1984. Named in honour of Dr. Guy Henson, one of Nova Scotia's most outstanding adult education pioneers, the College builds on Dalhousie's 60-year tradition of active research, community development and outreach, and adult education.

The mandate of Henson College is to provide leadership and support for Dalhousie in its efforts to meet the learning needs of the communities it serves. Using the tools of programme design and delivery, applied research, innovative teaching and technology, consulting, outreach and increased accessibility, the College partners with constituencies far beyond Dalhousie's traditional student population.

Within the context of the new economy, the College is committed to enhancing Dalhousie's contribution to regional economic, social and cultural development. It reinforces long-standing partnerships and builds new ones. It works closely with other faculties and units at Dalhousie. It connects with community groups, private sector and professional organizations, governments at all three levels, and a wide range of individuals and voluntary agencies.

Built upon this base, a number of Henson programmes are well-known and highly regarded outside the region; they serve national and international, as well as regional, constituencies.

II. Programmes and Services

Henson College offers a wide array of specific programmes and services (including needs assessment and survey services, special seminars and conferences, and specialized consultant resources). These are focused around a number of key development themes. The College continually evaluates and adapts its efforts in order to respond to the new learning needs of individuals, groups and organizations. What follows is a general description of current

College programmes and themes. For detailed information, please contact the College directly 6100 University Avenue, Halifax, NS, Phone: 902-494-2526, Fax: 902-494-6875

A. Management Development and Training

In a period of decreasing resources and increasing demand, effective management development and training is crucial in every sector and organization. The College has long provided programmes designed to meet the needs of the business, governmental and voluntary sectors. More recently, the College has developed a range of programmes related to public safety in terms of the provision of fire and police services, emergency measures planning and delivery and front line emergency medical training.

The following are available in print-based distance education form:

- Certificate in Business Management
- Certificate in Small Business Management
- Certificate in Financial Management
- Certificate in Human Resource Management
- Certificate in Organizational Management
- Certificate in Local Government Administration
- Certificate in Municipal Governing
- Certificate in Public Sector Management
- Certificate in Public Management
- Certificate in Fire Service Administration
- Certificate in Voluntary Fire Service Leadership
- Certificate in Police Leadership

In addition, the College offers on-site certificate programmes in:

- Non-Profit Sector Leadership Programme
- Adult Education
- Community Development
- Negotiation and Conflict Management
- WebMaster Certificate
- Novell CNE

B. Specialized Professional Development

The College works with Dalhousie and external partners to offer three other major programmes. Each of these programmes incorporates distance education in their delivery.

The first is the Certified Employee Benefits Specialist (CEBS) Programme, in partnership with the International Foundation of Employee Benefits, aimed at professionals and senior managers in this field.

The second is the Credit Union Institute of Canada (CUIC) Management Studies Programme, in cooperation with the CUIC, and designed for credit union employees across Canada.

The third programme, in cooperation with Dalhousie's School of Business Administration and the Institute of Canadian Bankers, is the Masters of Business Administration (Financial Services) aimed at professionals in the banking and trust company industry.

C. Transition Year Programme

Director

B. Johnson, BA, BSW, MSW (Dal)

Instructors

E. Alto, BA (Nigeria), MA (DA)

D. Anderson, BSc (SMU), BEd (Dal)

L. Choyce, BA (Rutgers), MA (Montclair), MA (CUNY)

B. Johnson, BA, BSW, MSW (Dal)

T. Sabattis, BSW, MSW (Dal)

I. Saney, BA, MA (SMU)

A. Surovell, AB (Boston), MA (Mass)

H. Weldon, MA (SMU)

The Transition Year Programme has served the post-secondary educational needs of the Mi'kmaq and Black Nova Scotian communities for over 25 years. It is a one-year programme designed for African-Canadian and First Nations students who wish to enter university but who may not yet meet standard entrance

requirements. The TYP was established to redress historic educational disadvantages to members of the Mi'kmaq and Black Nova Scotian communities.

While preparing its members for full admission to regular programmes at the beginning of their second year on campus, the programme introduces students to the university in a wide variety of ways. Its curriculum, which includes a variable number of credit classes, can be adapted to individual needs and objectives. The TYP core curriculum includes classes in Black and Native Studies, College-Level Communications, Strategies for University Learning, English and Mathematics. Students may also choose a regular first-year elective that is of personal interest to them. Classroom instruction is complemented by an orientation week, special lectures, campus tours, workshops and field trips. The programme's staff are drawn from the Dalhousie University community as well as the Nova Scotian Black and First Nations communities.

African-Canadian, non-status Native and Metis students accepted into the programme are eligible for university bursaries during their transition year. If they successfully complete this qualifying year, they become eligible for continued financial assistance as long as they remain in good academic standing and progress towards a first degree.

Status Native students attending the programme are funded through the Confederacy of Mainland MicMac, the Department of Indian Affairs or by individual band councils.

Enrolment is limited to ensure that each student receives personal attention and individual programming. Highly motivated First Nations and African-Canadian students of all ages and educational backgrounds are encouraged to apply. The TYP welcomes applications from students who did not complete high school or the classes required for university entrance and students who completed a general or mixed high school programme.

The admission criteria are somewhat 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:

Professor Beverly Johnson, Director
Transition Year Programme
Dalhousie University
Halifax, Nova Scotia B3H 3J5
(902) 494-3730

Deadline for receipt of applications for the following September: March 15th.

D. Computer Training

Henson College, in partnership with University Computing and Information Services (UCIS), provides a number of certificate programs and short courses to assist people in keeping pace with rapidly changing technology. We are a Novell Authorized Education Centre, offering CNA, CNE, Master CNE, and Certified Internet Professional training programmes. Our new Web Master Certificate programme develops the skills required for managing corporate web sites, or creating web sites on a contract basis. For those with strong technical skills, we share our teaching expertise with the Train the Computer Trainer workshop. We also offer training in all the popular applications, ranging from WordPerfect to Access to Create Your First Home Page. Call 902-494-2375 for additional information.

E. Entrepreneurship and Job Creation

For the past decade, the College has been a leader in policy development, applied research, and programme design and delivery in the Self Employment/Micro Enterprise field. The College offers Enterprise Development Programmes to a wide variety of groups and individuals as well as designing and providing innovative entrepreneurial development programmes and services for displaced fishers, Black youth, adults with

disabilities and others. Currently the College is the delivery agent for the Self Employment Assistance Programme in Halifax and Bedford.

F. Programmes and Services for Full and Part Time Mature Students

Who is a Mature Student?

A mature student is a person 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.

Pre-Admission Counselling

Many mature students find it helpful to sit down and discuss their educational plans with a student advisor. All full and part-time mature student candidates are encouraged to contact Henson College for pre-admission counselling with our Mature Student Advisor. Call (902) 494-2526 for more information or to make an appointment.

Mature Student Admission Programme

The University Exploration programme is one way for mature students who do not meet the regular admission requirements to be admitted to Dalhousie University as undergraduates. Please see Academic Regulations, Workload, on page 24 for information on the number of classes a University Exploration student may take in a single academic year.

Pre-University Classes

Henson College continues to offer a "bridging programme" for high school and mature students who are not fully prepared to start university. The pre-university courses are designed to help students develop their academic skills in a specific subject, improve their marks, complete a prerequisite to enter a specific university programme and build confidence before taking a university credit class.

Writing Skills for Academic Study, Pre-University Chemistry, MATH 0050.00: Accelerated Preparation for MATH 1000.03, MATH 0010.00: Pre-Calculus Mathematics (NS MATH 441), MATH 0009.00: Mathematical Foundations and MATH 0008.00: Transmath are currently offered by Henson College.

Mature Student Orientation

The "Returning to Learning" orientation is an opportunity for mature students to learn more about university services, tour the university campus and meet other mature students. For dates, please call Henson Registration (902) 494-2375.

Test Prep Classes

Henson College offers Kaplan courses to help students prepare for the DAT, LSAT, MCAT, GMAT, GRE, SAT and NCLEX (RN) tests. Courses include classroom instruction, a home study kit and extensive library practice material.

Kaplan's test preparation courses are recognized worldwide for the quality of instruction, state-of-the-art study tools and up-to-date, comprehensive information. Through its legendary courses and expanding catalogue of products and services, Kaplan has already helped millions of students get ahead.

G. Dalhousie Summer School

In cooperation with other Metro area universities, Henson College organizes and coordinates the Dalhousie Summer School, which offers undergraduate and graduate classes in the arts, social sciences and sciences as well as in several areas of professional study. Please call (902) 494-2375 for a copy of the summer school calendar.

H. English Language Programme

For the past 20 years, Dalhousie University has been providing English language immersion to senior high school, French-speaking students from Quebec and elsewhere under the auspices of the Federal Government's Summer Language Bursary Program (SLBP) offered through Henson College. The five-week intensive English language and cultural immersion programme attracts approximately 200 students per year. The programme consists of

formal classes, special interest classes, language intensive workshops and socio-cultural events which reinforce one another and increase opportunities for vocabulary development and enhanced communication.

For further information on any of the programmes and services offered for mature students please call Henson College at (902) 494-2526. Or check the Henson College homepage for more information at: <http://www.dal.ca/~henson/> or call our fax by information line at 1-800-932-0338 or 481-2408.

I. Dalhousie Negotiation and Conflict Management Programme

The Negotiation and Conflict Management Programme (NCMP) is a joint initiative of the Dalhousie Law School and Henson College. It is designed to help strengthen the quality of public and private decision-making and conflict management. To this objective, Dalhousie brings a wealth of expertise in public consultation, law, dispute processing, critical analysis, education, and competency development.

The Programme offers the Certificate in Negotiation and Conflict Management which requires completion of four NCMP workshops (each offered in a three-day format) and a competency evaluation, as follows:

- Negotiation and Dispute Resolution Workshop
- Mediation Workshop
- One of Advanced Negotiation Workshop or Advanced Mediation Workshop
- One Specialized Workshop from:
 - Labour Relations and Negotiation
 - Family Conflict
 - Commercial and Corporate Dispute Resolution
 - Equity Disputes
 - Employment Law and Workplace Disputes
 - Alternative Dispute Resolution and the Criminal Justice System
- Competency Evaluation (written and practical)

Workshops can be taken individually or as part of the Certificate programme.

For information, a current workshop schedule, and application forms, please contact:

Negotiation and Conflict Management Programme
Henson College, Dalhousie University
(902) 494-2375
E-mail: Conflict.Management@Dal.CA

African Studies

Location: Multidisciplinary Studies Centre
1444 Seymour Street
Halifax, NS B3H 3M5

Advisor: Jane Parpart
Telephone: (902) 494-3814
(902) 494-3667/2011

Fax: (902) 494-2105

Dean

Taylor, G.D., BA, PhD (Penn)

Dalhousie University offers a set of classes in different disciplines which focus on Africa. NOTE: This is not a programme leading to a degree in African Studies.

The Dalhousie 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.

Anatomy and Neurobiology

Location: Sir Charles Tupper Medical Building
12th, 13th, and 14th Floors
Halifax, NS B3H 4H7

Telephone: (902) 494-6850

Fax: (902) 494-1212

E-mail: anatomy@is.dal.ca

Dean

McIntyre, L., MD, MHSc, FRCP(C)

Dr. D.G.J. Campbell Professor and Head of Department

Hopkins, D.A.

Professors

Currie, R.W., BSA, MSc, PhD (Man)
Dickson, D.H., BA, MSc, PhD (Western), Associate Dean, Research and Planning, Faculty of Medicine
Hopkins, D.A., BSc (Alta), MA, PhD (McM)
Neumann, P.E., BA, MD (Brown)
Rutherford, J.G., BA (Cornell), MS (Syracuse), PhD (SUNY)
Semba K., BEd, MA (Tokyo), PhD (Rutgers)
Wassersug, R.J., BSc (Tufts), PhD (Chicago)

Associate Professors

Ellenberger, H.H., BA, MSc, PhD (Miami)
Hagg, T., BSc (Amsterdam), MD, MSc (Leiden), PhD (UCSD),
Graduate Studies Coordinator
Hansell, M.M., BSc (Tor), PhD (Calif)
Mobbs, I.G., BSc (Aberdeen), MSc (McM), PhD (Western)

Assistant Professors

Allen, G.V., BSc, PhD (Dal)
Clarke, D.B., MDCM, PhD, FRCSC (McGill)
Darvesh, S. MD (Dal), PhD (UNB)
Mathieson, W.B., MSc (Carleton), PhD (Ottawa)
Mendez, L., MD, PhD, FRCSC (Western)
Morris, S., MD (Ottawa)
Smith, F.M., BSc, MSc, PhD (UBC)

Lecturer

Sinha, G., MBBS (Banaras)

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

I. Classes Offered

ANAT 1010.03: Basic Human Anatomy.

This class is offered by the Department of Anatomy and Neurobiology primarily to students in the Schools of Nursing (SECTION 01) and Pharmacy (SECTION 02). A limited number of seats are available for Special Health Professions, Arts and Science, or Non-Degree students. Note that this course is also offered by DISTANCE EDUCATION (ANAT: C1010.03, SECTION 99) during the Regular Term (A & B sessions) and during the Spring Term (B session). Upon successful completion of the course, the student will be able to explain and describe, at a basic level, the gross anatomy and histology of the human body. There are no formal laboratory

sessions. However, a self-directed optional human anatomy laboratory will be provided throughout the year for independent study.

INSTRUCTOR: G.V. ALLEN

FORMAT: Lecture: 3 hours

RESTRICTION: Section 01 is restricted to Nursing students and a limited number of seats are available for Special Health Professions, Arts & Science, or Non-Degree students. Section 02 is restricted to Pharmacy students only. Section 99 is open to all students, unlimited seating.

ANAT 1020.03: Basic Human Anatomy.

This class is offered by the Department of Anatomy and Neurobiology primarily to students in Dental Hygiene, Recreation, Physical and Health Education and Kinesiology. A limited number of seats are available for Special Health Professions, Arts & Science, or Non-Degree students. Note that this course is also offered by DISTANCE EDUCATION (ANAT C 1010.03, SECTION 99) during the Regular Term (A & B sessions) and the Spring Term (B session). Upon successful completion of the course, the student will be able to explain and describe, at a basic level, the gross anatomy and histology of the human body. There are no formal laboratory sessions. However, a self-directed optional human anatomy laboratory will be provided throughout the year for independent study.

INSTRUCTOR: G.V. ALLEN

FORMAT: Lecture 3 hours

RESTRICTION: Restricted to students in Dental Hygiene, Recreation, Physical and Health Education and Kinesiology. A limited number of seats are available for Special Health Professions, Arts & Science, or Non-Degree students.

ANAT 1030.03: Gross Anatomy.

This class is taught by the Department of Anatomy and Neurobiology in the Faculty of Medicine and designed especially for Dental Hygiene students, and deals with detailed gross anatomy of the head and neck. This class complements ANAT 1020.03 and PHYL 1010.06.

INSTRUCTOR: D.A. Hopkins

FORMAT: Lecture/lab 2 hours

RESTRICTION: Restricted to Dental Hygiene students

ANAT 2100.03: 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.

INSTRUCTORS: H.H. Ellenberger, F.M. Smith

FORMAT: Lecture/lab 3 hours

PREREQUISITE: BIOL 2020.03 or permission of instructor

CROSS-LISTING: BIOL 3440.03, NESC 3440.03

RESTRICTION: Restricted to Occupational Therapy and Physiotherapy students (BIOL 3440.03 and NESC 3440.03 do not have this restriction)

ANAT 2160.03: 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.

INSTRUCTOR: D.H. Dickson

FORMAT: Lecture 2 hours, lab 2 hours

PREREQUISITE: BIOL 2020.03 or permission of instructor

CROSS-LISTING: BIOL 3430.03

RESTRICTION: Restricted to Physiotherapy students (does not apply to the cross-listing)

ANAT 2170.06: Gross Anatomy.

A regional study of human gross anatomy with emphasis on functional anatomy of the back and limbs. Laboratory work/study includes osteology, living (surface) anatomy and dissection of the human body. Biology students consent required, please see BIOL 3435 description for further details.

INSTRUCTORS: R.W. Currie, R.J. Wassersug

FORMAT: Lecture 1 hour, lab 4 hours

RESTRICTION: Restricted to Occupational Therapy and Physiotherapy students

CROSS-LISTING: BIOL 3435.06

ANAT 3421.03: Comparative Vertebrate Histology.

An advanced histology class surveying the whole range of vertebrate tissues and organs.

INSTRUCTOR: M.M. Hansell

FORMAT: Lecture 2 hours, lab 2 hours

PREREQUISITE: BIOL 3430.03

CROSS-LISTING: BIOL 3421.03

Architecture

See DalTech section of this calendar.

Arts and Social Sciences Interdisciplinary

ASSC 1000.03: Using Computers: An Introduction for Students in the Arts and Social Sciences.

This class is designed to introduce students in the BA programme to emerging information technologies and their practical value for the fine arts, humanities, social sciences and beyond. After a brief review of computer literacy, the central theme will be learning the effective use of common computer applications. In keeping with the highly integrated nature of computing, the last half of the class will focus on the creation of world wide web pages using common applications to prepare the contents. The skills covered in this class can be divided into the following broad categories:

- general microcomputer usage
- how to make an informed computer purchase
- setting up and managing your own computer
- preparing documents with word processing, with an emphasis on scholarly papers
- carrying out basic calculations and creating charts with spread sheets
- preparing and delivering computer-based presentations
- developing your own creative computer images
- finding information on the internet
- creating a web page.

Prior experience will be beneficial but is not required.

INSTRUCTOR: P. O'Hara

FORMAT: Lecture 1.5 hours, lab 1.5 hours

PREREQUISITES: Desirable that students (in Arts/Social Sciences) know how to turn on computer and boot up, how computer uses bits & bytes to process information, how to format diskettes, how they store information, and how to care for them

EXCLUSION: Students may receive credit for only one of COMP 1000.03, COMM 1501.03 or ASSC 1000.03

RESTRICTION: Students enrolled in the BA programme only

ASSC 1010.06: Italian for Beginners.

Introduction to the basic structures of Italian, combined with practical vocabulary for oral and written communication. This class aims to develop all language skills (listening, speaking, reading, writing), by integrating grammar study, oral and written exercises, and situational contexts. The class also includes an introduction to Italian culture. This class fulfills the BA language requirement.

INSTRUCTOR: TBA

FORMAT: Lecture 3 hours, lab 1 hour

ASSC 4010.06: Teaching English as a Second Language.

In cooperation with the Royal Society of Arts (RSA), the University of Cambridge Local Examinations Syndicate (UCLES), and the International Language Institute (ILI), Dalhousie offers an intensive class leading to a Certificate in English Teaching to Adults (CELTA). The syllabus covers six major areas: (1) language awareness, (2) the learner, the teacher, and the teaching/learning context, (3) planning (4) classroom management and teaching skills, (5) resources and materials (6) professional development. The teacher-in-training conducts classes with actual adult learners. Critical feedback is provided on teaching practice, written assignments and evidence of professional development through the class.

INSTRUCTORS: UCLES-approved staff of the International Language Institute

FORMAT: Lab/tutorial 4 hours, teaching practice 2 hours

PREREQUISITE: Must be in good standing as third or fourth year university student

Biochemistry

Location: Sir Charles Tupper Medical Building
5859 University Avenue
College Street entrance, Ninth Floor
Halifax, NS B3H 4H7

Telephone: (902) 494-6436
Fax: (902) 494-1355
WWW: <http://www.biochem.dal.ca>

Interim Dean

Ryall, P.J.C., BSc (Dal), MSc (Alta), PhD (Dal)

Head of Department

Breckenridge, W.C.

Faculty Advisors

Palmer, F.B.St.C. - Co-op Advisor (494-2570) fpalmer@is.dal.ca
Singer, R.A. - Graduate Advisor (494-8847) rasinger@is.dal.ca
Wallace, C.J.A. - Undergraduate Advisor (494-1118)
cwallace@is.dal.ca

Professors

Breckenridge, W.C., BSc (Queen's), MSc, PhD (Tor)
Dolphin, P.J., BSc, PhD, DSc (Southampton)
Doolittle, W.F.,* AB (Harv), PhD (Stan)
Gray, M.W., BSc, PhD (Alta)
Helleiner, C.W., BA, PhD (Tor)*
Lazier, C.B., BA (Tor), MSc (UBC), PhD (Dal)
Palmer, F.B.St.C., BSc, PhD (UWO)
Russell D.W., BPharm, PhD, DSc (Lond), BEd (Dal)*
Singer, R.A., AB (Princeton), PhD (Harv)
Wallace, C.J.A., BA, MA, DPhil (Oxon)
* Post-retirement appointments

Associate Professors

Byers, D.M., BSc, MSc (Dal), PhD (Alta)
Cook, H.W., BSc, MSc (McG), PhD (Dal)
Ridgway, N.D., BSc (Dal), PhD (UBC)
Ro, H.-S., BSc, PhD (McM)

Assistant Professors

Bearne, S.L., BSc (Acadia), PhD (Tor), MD (McG)
Dobson, M.J., BSc (Dal), DPhil (Oxon)
Liu, P.X.-Q., BSc (Wuhan), PhD (Cornell)
McMaster, C.R., BSc (Man), PhD (Man)
Toc, C.K.-L., BSc, PhD (Hawaii)

Lecturers

Riddell, D.C., BSc, PhD (Queen's)

i. 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. The core programmes can be adapted to emphasize different biochemical specialties such as structural biology, metabolism, molecular biology and biotechnology. Students wishing

to pursue advanced studies in Pharmacology or related sciences for which there is no undergraduate programme can include classes in Physiology, Pharmacology and/or Pathology in their programmes. Greater flexibility is available in combined degree programmes of Biochemistry with another subject; most often with Chemistry, Microbiology, Biology, Neuroscience or Psychology. Specific programmes developed with the Department of Microbiology and Immunology provide coordinated studies of metabolism, enzymology and molecular biology with bacteriology, virology and immunology. These programmes provide the foundation for molecular genetics, genetic engineering and biotechnology.

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 writing of reports is expected to be an individual effort, meeting the guidelines on plagiarism set out in the University Regulations in the Calendar.

II. 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. C.J.A. Wallace), or another faculty advisor (Dr. M. Dobson, Dr. P.X.-Q. Liu).

There is no three-year programme with a Biochemistry major. Students wishing to include Biochemistry in other programmes are welcomed. Note that all Biochemistry classes have prerequisites.

For general Degree Requirements, please see the Degree Requirements section in this calendar.

A. BSc with Honours in Biochemistry

This is a special concentrated Honours Programme in which emphasis may be placed on different areas of biochemistry such as protein chemistry, metabolism, molecular genetics or biotechnology. Because Biochemistry and Chemistry are closely interwoven both conceptually and experimentally, the list of major classes required 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 MATH 1060.03 or 2060.03. For entrance to BIOC 2200.03, students require minimum grades of B- in BIOL 1000.06 and CHEM 1040.06 (or equivalent). Honours students must meet the general degree requirements of the faculty.

Departmental Requirements

2000 level

- BIOC 2020.03
- BIOC 2030.03
- BIOC 2200.03
- CHEM 2201.03
- CHEM 2301.03 and 2302.03, or CHEM 2303.03
- CHEM 2401.03 and 2402.03

3000 level

- BIOC 3200.03
- BIOC 3300.03
- BIOC 3400.03
- CHEM 3402.03 and CHEM 3403.03 or MICR 3033.03

4000 level

- BIOC 4404.03
- BIOC 4604.03 and 4605.03
- BIOC 4603.03

Two more credits in Biochemistry including 0.5 in 43** series and 0.5 in 47** series

Other required classes

- CHEM 1040.06
- BIOL 1000.06
- PHYC 1100.06 or 1300.06
- MATH 1000.03 and 1010.03
- or, in lieu of the above, SCIE 1500.30

Other requirements

Two credits in a minor subject and a pass in the Honours Qualifying examination.

A minor subject (see Degree Requirements) should be chosen in consultation with the department's Advisor.

B. BSc with Combined Honours in Biochemistry and Another Subject

Biochemistry may be chosen along with one of Biology, Chemistry, Mathematics, Microbiology, Physics, Psychology, or possibly another subject, for a Combined Honours Programme.

Departmental Requirements

- BIOC 2020.03
- BIOC 2030.03
- BIOC 2200.03
- BIOC 3200.03
- BIOC 3300.03
- BIOC 3400.03
- BIOC 4603.03
- one full credit from BIOC 43XX, BIOC 44XX, BIOC 47XX
- CHEM 2401.03 AND 2402.03
- CHEM 2303.03, or CHEM 2301.03 and 2302.03

Consult the Undergraduate Advisor, Dr. C.J.A. Wallace, for details of recommended courses of study.

C. 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.

Departmental Requirements

1000 level

- BIOL 1000.06 - minimum passing grade B-
- CHEM 1040.06 - minimum passing grade B-
- 1 full credit in mathematics

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.

2000 level

- BIOC 2020.03
- BIOC 2030.03
- BIOC 2200.03
- CHEM 2201.03
- CHEM 2303.03
- CHEM 2401.03 and 2402.03

3000 level

- BIOC 3200.03
- BIOC 3300.03
- BIOC 3400.03

4000 level

- Three full credits in Biochemistry at 4000 level

D. Medical Biotechnology Stream

The department, in collaboration with the Department of Microbiology and Immunology, has a coordinated Medical Biotechnology Stream in the concentrated Honours, Combined Honours and Advanced Major programmes. This stream is designed

to optimally prepare those seeking a career in Biotechnology in general and Medical Biotechnology in particular. The specific requirements are outlined in the departmental undergraduate handbook. Programmes differ little in the early years, so that a good basic training for Biochemistry and Microbiology/Immunology is acquired, with specialization involving additional required and selective classes in the later years.

E. Co-operative Education in Biochemistry

Co-operative education programmes provide an integrated sequence of academic classes and supervised work terms in industry, government and university laboratories. Co-op education is offered in Honours, Combined Honours and Advanced Major degrees. The programmes consist of eight academic terms and four work terms. A satisfactory written report describing activities during each work term is required. Class requirements are the same as for the regular degree programmes. Participation in a non-credit Co-op seminar (SCIE 8700.00) is required prior to the first work term which normally occurs in the summer following the second year of study.

See the "Co-operative Education in Science" section of this calendar for a general description of Co-op requirements. Students normally apply to the department at the beginning of their second year. Admission to the Biochemistry Co-op programme requires a GPA of at least 3.00 in first year classes. Continuance in the Co-op programme requires that students maintain a GPA of 3.00 (honours) or 2.50 (advanced major) in the subjects of concentration (major and minor) to graduate with the Co-op designation.

The work-study programme.

Year	Fall	Winter	Summer
1	Acad	Acad	—
2	Acad	Acad	W1
3	Acad	Acad	W2
4	W3	Acad	W4
5	Acad		

For further information, contact Dr. Palmer, Biochemistry Co-op Coordinator and Science Co-operative Education, 4th floor, Student Union Building.

III. 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 1420.03: Introductory Biochemistry for Nursing Students.

Topics discussed are structure, biosynthesis, and function of carbohydrates, lipids, proteins and nucleic acids; enzyme kinetics; genetic engineering; nutrition. Medical aspects are stressed.

INSTRUCTOR: C.W. Helleiner

FORMAT: Lecture 3 hours/lab 2 hours

PREREQUISITE: Chemistry 1410.03 or permission of Instructor

EXCLUSION: This class cannot be used as a prerequisite for any other biochemistry class and is normally restricted to students in the BScN programme.

BIOC 2020.03: Cell Biology.

See class description for BIOL 2020.03, in the Biology section of this calendar.

BIOC 2030.03: Genetics and Molecular Biology.

See class description for BIOL 2030.03, in the Biology section of this calendar.

BIOC 2200.03: Introductory Biochemistry.

This class will survey basic topics and concepts of Biochemistry. The structures, properties and metabolic inter-relations of proteins, carbohydrates and lipids will be considered together with an introduction to nutrition and metabolic control. Although mammalian examples will predominate some consideration of

special aspects of biochemistry of microbes and plants will be included. In the laboratory, fundamental properties of peptides, proteins and enzymes will be explored.

INSTRUCTOR: C.B. Lazier, F.B. Palmer

FORMAT: Lecture 3 hours, tutorial 1 hour, lab 3 hours

PREREQUISITES: BIOL 1000.06, CHEM 1040.06, grades of B-

Students are advised to also take CHEM 2401.03 and 2402.03, or CHEM 2441.03

CROSS-LISTING: BIOL 2010.03

BIOC 3200.03: Biological Chemistry.

This class deals with chemical principles governing biochemical systems, and in particular, how they operate in the relationship between structure and function in proteins. 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.

INSTRUCTOR: P.J. Dolphin, C.J.A. Wallace

FORMAT: Lecture 3 hours/lab 3 hours

PREREQUISITE: CHEM 2401.03 and 2402.03, or CHEM 2441.03;

BIOC 2020.03, 2030.03, 2200.03 or instructor's consent

CROSS-LISTING: BIOL 3012.03

BIOC 3300.03: 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 emphasized, 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.

INSTRUCTOR: F.B. Palmer, W.C. Breckenridge

FORMAT: Lecture 3 hours/lab 3 hours

PREREQUISITE: CHEM 2401.03 and 2402.03, or CHEM 2441.03;

BIOC 2020.03, 2030.03, 2200.03, or instructor's consent

CROSS-LISTING: BIOL 3013.03

BIOC 3400.03: 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.

INSTRUCTOR: M.W. Gray, M. Dobson

FORMAT: Lecture 3 hours/lab 3 hours

PREREQUISITE: CHEM 2401.03 and 2402.03, or CHEM 2441.03;

BIOC 2020.03, 2030.03, 2200.03 or instructor's consent

CROSS-LISTING: BIOL 3014.03

BIOC 4001.03: Special Topics in Biochemistry.

Students interested in topics not covered in formal classes may ask the department for special classes to meet their needs. The Undergraduate Advisor will assist students to ascertain if faculty expertise is available to direct reading and the preparation of papers and seminars in a particular subject area.

COORDINATOR: C.J.A. Wallace

FORMAT: TBA

PREREQUISITE: BIOC 3200.03, 3300.03, and 3400.03

CROSS-LISTING: BIOC 5001.03

BIOC 4301.03: 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.

INSTRUCTOR: D.M. Byers, H.W. Cook, C.B. Lazier

FORMAT: Lecture 3 hours

PREREQUISITE: BIOC 3200.03, 3300.03, and 3400.03 or instructors' consent

CROSS-LISTING: BIOC 5300.03

BIOC 4302.03: Biochemistry of Lipids.

The biochemistry and metabolism of a variety of lipids is studied, especially of those, such as fatty acids, glycolipids, eicosanoids, steroids and phospholipids, with specialized physiological or lipid-second messenger functions. Heavy emphasis is given to intracellular and inter-tissue transport and regulatory processes. The chemistry and physics of insoluble lipids in an aqueous environment are explored and problems in the interaction of lipids with soluble and insoluble enzymes are considered.

INSTRUCTOR: H.W. Cook, N. Ridgway

FORMAT: Lecture 3 hours

PREREQUISITE: BIOC 3200.03 and 3300.03

CROSS-LISTING: BIOC 5301.03

***BIOC 4304.03: 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.

INSTRUCTOR: W.C. Breckenridge, P.J. Dolphin

FORMAT: Lecture 3 hours

PREREQUISITE: BIOC 3200.03 and 3300.03

CROSS-LISTING: BIOC 5304.03

BIOC 4403.03: Genes and Genomes.

This class 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.

INSTRUCTOR: P. Liu, W.F. Doolittle

FORMAT: Lecture 3 hours

PREREQUISITE: BIOC 2030.03, 3400.03 & 4404.03 and MICR 3033.03

CROSS-LISTING: MICR 4403.03, BIOL 4010.03, BIOC 5403.03

BIOC 4404.03: 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.

INSTRUCTOR: R.A. Singer

PREREQUISITE: BIOC 3400.03 or instructor's consent

CROSS-LISTING: MICR 4404.03, BIOL 4011.03, BIOC 5404.03

BIOC 4501.03: Medical Biotechnology I.

An introduction to biotechnology fundamentals from a medical perspective. Topics will include recombinant DNA technology, the polymerase chain reaction, immunochemical techniques, tissue culture, monoclonal antibodies and hybridoma technologies.

INSTRUCTOR: A.K. Kirumira

FORMAT: Lecture 3 hours, some demonstrations
PREREQUISITE: BIOC 3200.03, BIOC 3300.03, BIOC 3400.03 and
MICR 3115.03 or consent of instructor
CROSS-LISTING: PHAR 4351.03

BIOC 4502.03: Medical Biotechnology II.

A discussion of the applications of biotechnology in medicine and pharmacy. Topics will include modern vaccines, antibiotics and interferon production, technology of innovative biotech drugs, medical diagnostic devices, genetic and immunoadaptive therapy, biotech drug delivery and monitoring systems, forensic medicine and DNA fingerprinting.

INSTRUCTOR: A.K. Kirumira

FORMAT: Lecture 3 hours, some demonstrations

PREREQUISITE: BIOC 4501.03 or BIOC 3200.03, BIOC 3300.03,
BIOC 3400.03, and MICR 3115.03 or consent of instructor

CROSS-LISTING: PHAR 4352.03

BIOC 4603.03: 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 limited 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.

COORDINATOR: H.-S. Ro

INSTRUCTORS: Members of the departments of Biochemistry,
Biology and Microbiology

FORMAT: Lab 1 day

PREREQUISITE: BIOC 3200.03, 3300.03, and 3400.03

CROSS-LISTING: BIOL 4012.03/5012.03, MICR 4601.03/5601.03,
and BIOC 5603.03

BIOC 4604.03: Research Project I.

This class requires original biochemical research in the laboratory of a faculty member, and will require the equivalent of at least one day per week to be spent in the laboratory. A report is to be submitted at the end of the term. This class is intended to be taken in conjunction with BIOC 4605.03 and no credit can be given for one class without the other. The work undertaken in BIOC 4605.03 should be a continuation of that initiated in BIOC 4604.03 and hence the report submitted for BIOC 4605.03 may include data and analysis incorporated in the BIOC 4604.03 report. In exceptional cases, the research project can be done outside the biochemistry department. Prior approval must then be obtained from the class coordinator.

COORDINATOR: C.B. Lazier

FORMAT: Lab 1 day per week

PREREQUISITE: Permission of coordinator and a member of the
department who will serve as supervisor. At least a B average
for BIOC 3200.03, 3300.03 and 3400.03.

BIOC 4605.03: Research Project II.

This class requires original biochemical research in the laboratory of a faculty member, and will require the equivalent of at least one day per week to be spent in the laboratory. A report is to be submitted at the end of the term. This class is intended to be taken in conjunction with BIOC 4604.03 and no credit can be given for one class without the other. The work undertaken in BIOC 4605.03 should be a continuation of that initiated in BIOC 4604.03 and hence the report submitted for BIOC 4605.03 may include data and analysis incorporated in the BIOC 4604.03 report. In exceptional cases the research project can be done outside the biochemistry department. Prior approval must then be obtained from the class coordinator.

COORDINATOR: C.B. Lazier

FORMAT: Lab 1 day per week

PREREQUISITE: Permission of coordinator and a member of the
department who will serve as supervisor. At least a B average
for BIOC 3200.03, 3300.03 and 3400.03.

BIOC 4700.03: Proteins.

Methods of studying protein structure and conformation will be discussed with specific stress on the application of these methods to the understanding of the function of proteins at the molecular level. Topics will include multi-dimensional NMR spectroscopy and X-ray crystallography with regard to their application to structure determination as well as standard biochemical methodologies. Molecular mechanisms of interaction between proteins and other compounds including other proteins, nucleic acids and small molecules will be studied.

INSTRUCTOR: C.J.A. Wallace

FORMAT: Lecture 3 hours

PREREQUISITE: BIOC 3200.03; CHEM 2301.03 and 2302.03, or
CHEM 2303.03 or instructor's consent

CROSS-LISTING: BIOC 5700.03

BIOC 4701.03: Enzymes.

Fundamental principles of enzyme catalysis and its regulation will be examined. Use of tools such as steady-state and pre-steady-state kinetics, isotope effect measurements, site-directed mutagenesis, spectroscopy, X-ray crystallography, and mechanism-based inhibitors to study the architecture and mechanism of action of enzyme active sites will be presented. The catalytic mechanism and transition state stabilization will be considered in detail for selected enzymes that have been well-characterized structurally. Classic and current papers in the literature will be reviewed so that the experimental and conceptual approaches used may be critically appraised.

INSTRUCTOR: S.L. Bearne

FORMAT: Lecture 2.5 hours, seminar/tutorial 0.5 hour

PREREQUISITE: 3000-level classes in Biochemistry, CHEM 2301.03
and 2302.03, or CHEM 2303.03, or instructor's consent

CROSS-LISTING: BIOC 5701.03

BIOC 4804.03: Introduction to Pharmacology I.

See class description for BIOL 4404.03, in the Biology section of this calendar.

BIOC 4805.03: Introduction to Pharmacology II.

See class description for BIOL 4405.03, in the Biology section of this calendar.

BIOC 4811.03: Biochemistry of Clinical Disorders I.

This class is an introduction to the pathophysiology of disease. It provides the clinical and biochemical background to disease groups and system disorders and the laboratory approach to their diagnosis. Topics include cardiovascular, renal, gastrointestinal and hepatobiliary disorders, in addition to acid-base, blood and immune abnormalities.

INSTRUCTOR: B.A. Nassar

FORMAT: Lecture 3 hours, case studies and assignments

PREREQUISITES: BIOC 3200.03, 3300.03 and 3400.03 or consent of
instructor

CROSS-LISTING: BIOC 5811.03, PATH 5011.03

BIOC 4812.03: Biochemistry of Clinical Disorders II.

An introduction to the pathophysiology of disease. It takes the same approach as BIOC 4811.03, but different groups of diseases are discussed. Topics will include carbohydrate, lipid and amino acid disorders; endocrine and rheumatological diseases, as well as tumor markers and toxicology.

INSTRUCTOR: B.A. Nassar

FORMAT: Lecture 3 hours, case studies and assignments

PREREQUISITES: BIOC 3200.03, 3300.03 and 3400.03 or consent of instructor

CROSS-LISTING: BIOC 5812.03, PATH 5012.03

BIOC 8891.00: Co-op work term 1

BIOC 8892.00: Co-op work term 2

BIOC 8893.00: Co-op work term 3

BIOC 8894.00: Co-op work term 4

SCIE 3000.06: 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 in the Science, Interdisciplinary section of this calendar. This class is a recommended elective and is not accepted as a credit towards the major or minor subjects.

SCIE 8700.00: Co-op Seminar (non-credit)

This class prepares co-op students for work term experience. It is a prerequisite for the first work term.

Biology

Location: Life Science Centre, Second Floor
1355 Oxford Street
Halifax, NS B3H 4J1
Telephone: (902) 494-3515
Fax: (902) 494-3736

Interim Dean

Ryall, P.J.C., BSc (Dal), MSc (Alta), PhD (Dal)

Chair

O'Dor, R.

Undergraduate Programme Advisors

Beauchamp, C. (494-2145)
Breckenridge, J. (494-8817)
Corkett, C. (494-7016)
Harding, P. (494-2349)
Mills, A. (494-2893)
Retallack, B. (494-7072)
Staples, E. (494-2464)

Honours Programme Advisors

Collins, P. (Administration) (494-3847)
MacRae, T. (494-6525)
O'Halloran, M.J., Marine Biology (494-2136)
Pinder, A. (494-3822)
Walde, S. (494-6432)

Emeritus Professors

Vining, L.C., MSc (Auckland), PhD (Cantab), FRSC
von Maltzahn, K.E., MS, PhD (Yale)
McLaren, I.A., MSc (McG), PhD (Yale), George S. Campbell
Professor Emeritus

Professors

Brown, R.G., MSc (McG), PhD (Rutgers)
Fentress, J.C., PhD (Cantab) (major appointment in Psychology)
Freedman, B., MSc, PhD (Tor)
Hall, B.K., PhD, DSc (UNE), FRSC (Killam Professor of Biology)
Kamra, O.P., MS (NC State), PhD (Wash State)
Kimmings, W.C., PhD (Lond)
Lane, P.A., MSc (SUNY Binghamton), PhD (SUNY Albany)
Lee, R.W., MA (Mass), PhD (SUNY Stony Brook)
MacRae, T.H., MSc, PhD (Windsor)
Mills, E.L., MS, PhD (Yale) - (major appointment in Oceanography)
Myers, R.A., PhD (Dal), Senior Killam Research Professor
O'Dor, R.K., PhD (UBC)
Patriquin, D.G., MSc, PhD (McG)
Scheibling, R.E., PhD (McG)
Whitehead, H., PhD (Cantab)
Willison, J.H.M., PhD (Nottingham) - Jointly appointed with SRES
Wright, J.M., PhD (MUN)
Zouros, E., MSc, PhD (Agri Col Athens), PhD (Chicago)

Associate Professors

Angelopoulos, E.W., MS, PhD (Minn)
Croll, R.P., PhD (McG), major appointment in Physiology and
Biophysics
Pinder, A., PhD (Mass) University Research Fellow
Pohajdak, B., MSc, PhD (Man)
Walde, S., PhD (Calgary) University Research Fellow

Associate Professor (Research)

Newkirk, G.F., PhD (Duke)

Assistant Professors

Hart, M., PhD (Washington)
Hutchings, J., PhD (Memorial)
Iverson, S.J., PhD (Maryland), Women's Faculty Award
Johnston, M.O., PhD (Chicago)
Leonard, M., PhD (Ottawa), Women's Faculty Award

Summer Education and Applied Science Institute at Dalhousie in Ecology (S.E.A.S.I.D.E.)

Stacier, C., BSc (San Jose), MSc (N. Arizona State), PhD
(UMass/Amherst), Director

Adjunct Professors

Castell, J.D., MSc (Dal), PhD (Oregon State), Fish. & Mar. Serv.,
D.F.O.
Craigie, J.S., MSc, PhD (Queen's), Marine Biosciences Inst., NRC
Farley, J. (Ret'd)
Kenchington, E., BSc, MSc (Dal), PhD (Tasmania), D.F.O.
Kerr, S.R., PhD (Dal), Cox Fisheries Scientist-in-Residence
Silver, M., PhD (Syracuse)

Senior Instructors

Beauchamp, C., BSc, MSc (Memorial), BEd (Dal)
Breckenridge, J., BSc (Queen's), MSc (Dal)
Collins, P., BSc, MSc (Dal)
Corkett, C., BSc, DipEd (Technical), PhD (London)
Harding, P., BA (Tor), BEd, MSc, PhD (Dal)
Mills, A., BSc (Carleton)
O'Halloran, M.J., BSc (Southampton), BEd, MSc (Dal)
Retallack, B., BSc, MSc (Dal), PhD (Manchester)
Staples, E., BSc (Dal), BEd (MSVU)

Post Doctoral Fellows

Ekanayake, S., PhD (Dal)
Hoch, W., BSc, PhD (Michigan)
Hunter, A., BSc (Tor), MSc (Queen's), PhD (McG)
Miyake, T., MS (Michigan), PhD (Texas A&M)
Rose, C., MSc (Victoria), PhD (Harvard)
Tong, Y., MSc, PhD (Dal)
Yang, K.

Areas of Specialty of Biology Faculty

Animal Biology: S. Iverson, S. Kerr, M. Leonard, I. McLaren, A.
Pinder
Cell Biology: T. MacRae, W. Pohajdak
Developmental Biology: B.K. Hall, T. MacRae, A. Pinder
Ecology/Environmental Science: R.W. Doyle, B. Freedman, J.
Hutchings, M. Johnston, P. Lane, M. Leonard, I. McLaren, R.
Scheibling, S. Walde, H. Whitehead, M. Willison
Entomology and Parasitology: E. Angelopoulos
Evolutionary Biology: R.W. Doyle, J. Hutchings, M. Johnston, E.
Zouros
General Studies: K.E. vonMaltzahn
Genetics: R.W. Doyle, M. Johnston, O.P. Kamra, R.W. Lee, E.
Zouros
Marine Biology: A.R.O. Chapman, J. Hutchings, S. Iverson, R.K.
O'Dor, R. Scheibling, H. Whitehead
Microbiology: R.G. Brown, L.C. Vining
Molecular Biology: T. MacRae, B. Pohajdak, J. Wright
Physiology: S. Iverson, R.K. O'Dor, D. Patriquin, A. Pinder
Plant Biology: A.R.O. Chapman, M. Johnston, D. Patriquin, M.
Willison

I. 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 (Co-op or Regular) and BSc Honours (Co-op or Regular) in Marine Biology. Consult the "Degree Requirements" section of this calendar for full details.

A. Honours Biology, BA, BSc

Honours Advisors:

Collins, Pat (Administration, 494-3847)

MacRae, Tom (494-6525)

Pinder, Alan (494-3822)

Walde, Sandy (494-6432)

Students will not normally be officially registered into an Honours programme until the end of their 2nd year after they have completed at least most of the required 2nd year classes and earned the specified 3.0 GPA in them. Students may be admitted into a programme without having completed all of the 2nd and 3rd year required classes but their ultimate graduation with an honours degree will be conditional upon achieving a 3.0 average in these classes.

Students considering doing an honours programme are encouraged to pick up a departmental honours record form which lists the classes which are required. These forms are available in the Biology Main office in LSC 2078. Students should also attend the Cameron Conference for Honours Students which is held in the department at the end of January of each year, as this is an excellent opportunity to talk to honours students who are in the final year of their programme and to find out about the thesis research, the process of finding honours supervisors and other issues related to an honours programme.

It is the responsibility of students to arrange for a supervisor for their thesis research. Honours theses may be supervised by a faculty member of the Biology department, or by an external scientific investigator, subject to the approval of the honours committee. A list of external researchers who have previously served as honours supervisors and are therefore approved to supervise future honours students is posted on the Honours bulletin board outside the Biology Main Office in LSC 2078. Students should begin to search for a potential supervisor during their 3rd year of study and should have completed arrangements by May of their 3rd year. If students wish to be supervised by someone external to the department who has not been previously approved by the honours committee, they must consult with their honours advisor to determine this potential supervisor's eligibility.

Departmental Requirements

See the section of the calendar "Academic Regulations", including "Degree Requirements" and "Graduation Standing" for the number of classes and the grade level required for Concentrated, Combined, or Multidisciplinary Honours Programmes. To register for a Multidisciplinary Programme, students meet with the Chairs of each of the departments they wish to design a programme with. To register for a Concentrated or Combined Honours Programme in Biology, students meet with a Biology Honours advisor. *In addition* to the University degree requirements, students taking ANY TYPE of Biology Honours Programme, even if Biology is the Allied subject of a Combined programme, must take the following classes.

Classes required in all Biology Honours Programmes

1000 level

- BIOL 1000.06 or SCIE 1500.03 (with a minimum grade of B-)

A "B" AVERAGE (3.0) MUST BE ATTAINED IN THE FOLLOWING 2ND AND 3RD YEAR LEVEL REQUIRED CLASSES. A maximum of two of these required classes may be repeated in an attempt to achieve this grade point average.

2000 level

- BIOL 2020.03
- BIOL 2030.03
- BIOL 2060.03
- Two from: BIOL 2001.03, 2002.03 and 2101.03

3000 level

- BIOL 3041.03
- At least one class from: BIOL 3050.03, 3070.06, and PHYL 2030.06 (PHYL 2030.06 will be counted as a 2nd year level Biology credit.)

4000 level

- BIOL 4900.06 (required for those in a Concentrated Honours and Combined Honours programmes in which Biology is the major area of study)
- Honours Qualifying exam (graded as Pass/Fail and based on participation in BIOL 4900.06 class and the Cameron Conference for Honours students)
- NOTE: A minimum of 9 credits in Biology above the 1000 level, including 2 credits above the 2000 level are required for the Honours degree.

Other Required Classes

• MINOR REQUIREMENT:

- for Concentrated Honours programmes, two full credits above the 1000 level are required to satisfy the Minor component of the programme; can be in any subject other than Biology
- CHEM 1040.06 or 1010.06 or 1500.06

Other Recommended Classes

- PHYC 1300.06 or 1000.06 or 1100.06 or *1500.03 and *1550.03 (*last offered in 94/95)
- MATH 1000.03 and MATH 1060.03

B. Advanced Major in Biology

Departmental Requirements

1000 level

- BIOL 1000.06, BIOL 1001.06 or SCIE 1500.30 (with a minimum grade of B-)

2000 level

- BIOL 2020.03
- BIOL 2001.03 or 2002.03 or 2101.03
- BIOL 2060.03
- BIOL 2030.03
- One other Biology credit at or above the 2000 level not including the classes listed below.

3000 level

- Minimum three credits at or above the 3000 level

C. Major in Biology

Departmental Requirements

1000 level: BIOL 1000.06 or 1001.06 or SCIE 1500.30 (with a minimum grade of B-)

2000 level: BIOL 2020.03
BIOL 2101.03 or 2001.03 or 2002.03
BIOL 2060.03
BIOL 2030.03

3000 level: At least two credits at or above the 3000 level

D. Honours and Advanced Major in Marine Biology

Advisors: Honours Marine and Honours Marine Co-Ordinator

M.J. O'Halloran (494-2136)

Advanced Major in Marine:

J. Hutchings (494-2687)

S. Iveson (494-2566)

B. Scheibling (494-2296)

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.

II. Classes Offered

The normal entry requirement for admission to upper level classes in Biology is a grade of B- or better in BIOL 1000.06, 1001.06, or SCIE 1500.30. Students with a grade lower than B- and extenuating circumstances may appeal to the department Undergraduate Coordinator.

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.

Biology classes are grouped into four general categories:

1. **1000 - Level classes:** BIOL 1000.06 This class is intended to be introductory university-level classes in biology.
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 the 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 - BIOL 2020.03
 - ii. Diversity of Organisms (animals, plants and microbes)
 - BIOL 2001.03
 - BIOL 2002.03
 - BIOL 2101.03
 - iii. Ecology - BIOL 2060.03
 - iv. Genetics and Molecular Biology - BIOL 2030.03

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.

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 totaling 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 2100.03, 3033.03, 3114.03, 3115.03, 3118.03, 4026.03, 4027.03, 4037.03, 4038.03, 4114.03, 4115.03, 4118.03, and 4301.03.

BIOL 1000.06: Principles of General Biology.

This class surveys the fundamental principles of biology and prepares 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. Knowledge of high school level mathematics and chemistry is recommended.

INSTRUCTOR: C. Corkett, E. Welsh, T. MacRae, D.G. Patriquin and other faculty
FORMAT: Lecture 3 hours/week, lab/tutorial 3 hours/week.
EXCLUSION: BIOL 1001.06 (no longer offered)

BIOL 2001.03: 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.

INSTRUCTOR: C. Corkett, R. Scheibling

FORMAT: Lecture 2 hours, lab 3 hours

PREREQUISITE: One full credit in Biology at the 1000-level or SCIE 1500.30 (Grade B- or better)

BIOL 2002.03: Terrestrial Diversity (Area II).

A survey of the terrestrial plants, fungi and animals. The class emphasizes the restrictions imposed on terrestrial adaptations by the aquatic origins of the colonizers and discusses the physiology of living in a terrestrial environment.

INSTRUCTOR: M. Johnston, M. Leonard and A.H. Mills

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITE: One full credit in Biology at the 1000-level or SCIE 1500.30 (Grade B- or better)

BIOL 2010.03: Introductory Biochemistry.

See class description for BIOC 2200.03, in the Biochemistry section of this calendar.

BIOL 2020.03: 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.

INSTRUCTOR: T.H. MacRae, B. Pohajdak, and B. Retallack

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITE: One full credit in Biology at the 1000-level or SCIE 1500.30 (Grade B- or better)

CROSS-LISTING: BIOC 2020.03

EXCLUSION: BIOL 2015.06, BIOC 2000.06

BIOL 2030.03: 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.

INSTRUCTOR: C. Helleiner (Biochemistry), E. Staples, J. Wright

FORMAT: Lecture 3 hours, lab/tutorial 3 hours

PREREQUISITE: One full credit in Biology at the 1000-level or SCIE 1500.30 (Grade B- or better)

RECOMMENDED: CHEM 1010.06, 1040.06 or equivalent

EXCLUSION: BIOL 2035.06 (last offered in 1989-90)

CROSS-LISTING: BIOC 2030.03

BIOL 2060.03: 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.

INSTRUCTOR: C. Beauchamp, J. Hutchings, R. Scheibling, S. Walde
FORMAT: Lecture 3 hours, lab/tutorial 2 hours
PREREQUISITE: One full credit in Biology at the 1000-level or SCIE 1500.30 (Grade B- or better)
EXCLUSION: BIOL 2046.06, BIOL 2066.03

BIOL 2101.03: 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 2100.03 as content is different.

INSTRUCTOR: J. Breckenridge, B. Pohajdak
FORMAT: Lecture 2 hours, lab 3-4 hours
PREREQUISITE: One full credit in Biology at the 1000-level or SCIE 1500.30 (Grade B- or better) or permission of the instructor

BIOL 3012.03: Introduction to Biological Chemistry.

See class description for BIOC 3200.03, in the Biochemistry section of this calendar.

BIOL 3013.03: Intermediary Metabolism.

See class description for BIOC 3300.03, in the Biochemistry section of this calendar.

BIOL 3014.03: Nucleic Acid Biochemistry and Molecular Biology.

See class description BIOC 3400.03, in the Biochemistry section of this calendar.

BIOL 3020.03: Advanced Cell Biology.

The lipid bilayer of the eukaryotic cell is a seemingly impervious membrane that separates components of the cell associated with life from the external environment. How the cell moves ions, compounds, and viruses across the cell membrane will be the topic of this course. The structures that achieve this transport — ion channels, co-transporters, receptors — will be explored as molecules and as functioning systems that, at one level, transport ions associated with nerve transmissions and higher levels are associated with pathological conditions of diabetes and HIV.

INSTRUCTOR: C. Boyd
FORMAT: Writing Intensive, 3 lectures per week
PREREQUISITE: BIOL 2020.03 (with a minimum grade of B-) or instructor's consent

***BIOL 3032.03: Cytogenetics.**

(May not be offered 1998/99.)
Detailed consideration of certain genetical and cytological mechanisms in relation to chromosomal modifications, gene mutations and evolution.

INSTRUCTOR: O.P. Kamra
FORMAT: Lecture 2 hours, lab 3 hours
PREREQUISITE: BIOL 2030.03

***BIOL 3039.03: Human Genetics.**

(May not be offered 1998/99.)
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 behavioral 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.

INSTRUCTOR: O. Kamra (Coordinator)
FORMAT: Lecture 3 hours, lab 2 hours
PREREQUISITE: BIOL 2030.03

BIOL 3041.03: Evolution.

Evolution is a comprehensive, integrative class covering a great breadth of topics related to the process of evolution (patterns of diversity and evolutionary history of particular groups are covered in other classes). Topics will include the history of evolutionary thought, Darwinian evolution, the "Modern Synthesis", adaptation, the relationship between evolution and systematics, evolutionary developmental biology, molecular evolution, and current controversies such as the neutral theory of molecular evolution, group selection, non-adaptive evolution, and mass extinctions and chance as major influences on evolution.

INSTRUCTOR: B.K. Hall, M. Johnston, M. Ragan, and staff
FORMAT: Lecture 3 hours, tutorial 1 hour
PREREQUISITE: BIOL 2020.03, 2030.03, 2060.03 and one of 2001.03, 2002.03 or 2101.03
CO-REQUISITE: BIOL 3050.03 would be useful, but not mandatory
EXCLUSION: BIOL 3040.06

BIOL 3050.03: 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.

INSTRUCTOR: P. Collins, B.K. Hall, Staff
FORMAT: Lecture/discussion 3 hours, lab 3 hours
PREREQUISITE: One full credit in Biology at the 1000-level or SCIE 1500.30
CO-REQUISITE: BIOL 2020.03, BIOL 2030.03

BIOL 3051.03: Advanced Animal Development.

This class is the follow-up to BIOL 3050.03 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.

INSTRUCTOR: P. Collins, B.K. Hall, and staff
FORMAT: Lecture 3 hours, lab/discussions 3 hours
PREREQUISITE: BIOL 3050.03 (with a minimum grade of B-) or instructor's permission; plus completed or concurrent registration in second-year core cell/molecular classes

BIOL 3060.03: 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, resource degradation, warfare, and broader topics such as environmental impact assessment and ecological monitoring and research.

INSTRUCTOR: B. Freedman
FORMAT: Lecture 2 hours, tutorial 3 hours
PREREQUISITE: BIOL 2060.03 (or see instructor)
CROSS-LISTING: BIOL 5060.03

BIOL 3061.03: Communities and Ecosystems.

This class is divided into three sections:
(A) Introduction, History and Concepts to Community Structure and Stability;
(B) Environmental Assessment and Management at the Ecosystem level; and
(C) Case Studies and Global Problems.

INSTRUCTOR: P.A. Lane
FORMAT: Lecture 3 hours
PREREQUISITE: BIOL 2060.03

BIOL 3062.03: Behavioral 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 essay assignments.

INSTRUCTOR: M. Leonard

FORMAT: Lecture 2 hours, tutorial 1 hour

PREREQUISITE: BIOL 2060.03

BIOL 3063.03: Resource Ecology.

Introduction to ecologically 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.

INSTRUCTOR: R. Doyle, B. Freedman, J. Hutchings

FORMAT: Lecture/seminar 3 hours

PREREQUISITE: BIOL 2060.03; MATH 1010.03, 1060.03 or equivalent

BIOL 3066.03: Plant Ecology.

Ecology refers both to the interactions between organism and environment as well as to the formal scientific study of these interactions. In plants these interactions can involve other plants, as in competition, or animals, as in pollination, herbivory, seed predation and seed dispersal. Plants stand still after they have passed the seed stage. Standing still means that plants must survive and make offspring in an environment that is imposed upon them. This class examines the causes and consequences of being a plant from an evolutionary perspective. Ecological interactions both cause natural selection and are themselves the consequences of evolution. The overriding theme of the class, therefore, is that of the ecological theatre and the evolutionary play (in the words of G.E. Hutchinson). This class concentrates on individual interactions, adaptations and processes. Processes, such as nutrient cycling, that occur at the level of communities or ecosystems will receive little attention.

INSTRUCTOR: M. Johnston

FORMAT: Lecture 3 hours, lab/tutorial 3 hours, one/two field trips on weekends including first weekend after classes begin

PREREQUISITE: BIOL 2030.03 and 2060.03

CROSS-LISTING: BIOL 5066.03

BIOL 3067.03: Ecology and Evolution of Fishes.

This class will examine selected topics on the ecology and evolution of marine and freshwater fishes. Topics shall include systematics, morphology, evolutionary ecology, behaviour, life history strategies, population biology, and fisheries management.

INSTRUCTOR: J. Hutchings

FORMAT: Lecture 3 hours, tutorial/lab 1½ - 3 hours

PREREQUISITE: BIOL 2001.03, 2060.03

CROSS-LISTING: BIOL 5067.03

BIOL 3068.03: Agroecosystems.

Agroecosystems, which are defined spatially as individual crops or farms, occupy approximately 35% of the ice-free land area.

Biodiversity varies from enhanced to impoverished in comparison to the pristine systems that were converted to agriculture.

Agroecosystems have significant impacts on adjacent ecosystems and on global ecological processes. In this class we examine:

domestication of crops and livestock; classification of agroecosystems; relationships between climate, crops and soils; foodwebs and energy flows; nutrient cycling; biotic interactions affecting weeds, pests and diseases; impacts of agroecosystems on other ecosystems; human nutritional needs, population growth and agricultural production; conservation of biodiversity in agroecosystems. Numerical problem solving is emphasized. Students select specific agroecosystems and topical issues for individual and small group study, according to their interests. The class employs a computer assisted, collaborative learning approach.

INSTRUCTOR: D. Patriquin

FORMAT: Lecture/Group work/Demonstration Labs 4 hours

PREREQUISITE: BIOL 2060.03 or permission of instructor

BIOL 3069.03: 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

PREREQUISITE: BIOL 2060.03 (minimum grade of B), MATH 1010.03, 1060.03 or equivalent

BIOL 3070.06: 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.

INSTRUCTOR: S.J. Iverson, R.K. O'Dor, A. Pinder, M-J. O'Halloran

FORMAT: Writing Intensive, lecture 3 hours, lab 3 hours

PREREQUISITE: BIOL 2001.03 or 2002.03, 2020.03

EXCLUSION: BIOL 3071.06, 3074.03, 3076.03

BIOL 3071.06 (3074.03/3076.03): 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. BIOL 3074.03/3076.03 Physiology of Marine Animals Parts I and II are ONLY OPEN to Marine Biology Co-op (Honours and Advanced Major) students that are unable to take BIOL 3071.06 because of work term schedules. These Co-op students must take both classes, normally BIOL 3074.03 in their 3rd year and 3076.03 in their 4th year. All other students should take BIOL 3071.06.

INSTRUCTOR: S.J. Iverson, R.K. O'Dor, M-J. O'Halloran, A. Pinder

FORMAT: Writing Intensive, lecture 3 hours, lab 3 hours

PREREQUISITE: BIOL 2001.03 or 2002.03, 2020.03

EXCLUSION: BIOL 3070.06

BIOL 3100.03: Aquatic Microbiology.

The main emphasis of this class is on the interactions of microbes with aquatic plants and animals including nutrition, disease, and disease resistance mechanisms. Part of the class considers the role of microorganisms in nutrient availability and productivity in aquatic environments.

INSTRUCTOR: R.G. Brown and D. Cone

FORMAT: Lecture 2 hours, lab 3 hours

PREREQUISITE: Normally, Biology 2101.03 or Microbiology 2100.03, but Marine Biology Honours students are exempt.

BIOL 3113.03: Bacterial Physiology.

The biochemistry of the physiological pathways is considered in relation to the biology of bacteria. A good knowledge of basic microbiology and biochemistry is required.

INSTRUCTOR: M. Silver

FORMAT: Lecture 2 hours

PREREQUISITE: BIOL 2101.03

BIOL 3211.03: 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.

INSTRUCTOR: J. McLachlan

FORMAT: Lecture 2 hours, lab 3 hours

PREREQUISITE: Grade B or better in BIOL 2001.03 or permission of instructor

BIOL 3212.03: Biology of the Algae.

A non-taxonomic examination of the cellular, organismic, population and community organizations of benthic and planktonic algae.

INSTRUCTOR: A. Albrecht, A. Chapman

FORMAT: Lecture 2 hours, lab 3 hours

PREREQUISITE: Grade B or better in BIOL 2001.03 or permission of instructor

BIOL 3215.03: Systematics of Higher Plants.

This class is concerned with an organismal approach to the study of flowering plants: identification, relationship, and evolution. The course focuses on gross morphology rather than internal anatomy. It provides an introduction to basic botanical terminology and to the concepts and the scientific conventions concerned with plant description, classification and nomenclature. Lectures examine the development of systematics from Linnaeus to Darwin, to the advent of modern experimental taxonomy (biosystematics). Laboratory exercises centre on the identification and characterization of flowering plant families through the use of diagnostic keys. For this purpose, students are provided with native and exotic living plants and freshly frozen specimens. Field ecologists, environmental biologists, and naturalists should find the applied approach to this course broadens their general knowledge of plants and enables them to identify plant specimens. Each student submits a small collection of pressed plants. (see instructor, preferably before September, for details).

INSTRUCTOR: P. Taschereau

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITE: Biology 2002.03, or instructor's consent

BIOL 3218.03: 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. This class may be useful to those considering the teaching profession, graduate school, or who are interested in increasing their general knowledge.

INSTRUCTOR: P.A. Collins

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITE: One full credit in Biology at the 1000-level or SCIE 1500.30 (Grade of B- or better)

BIOL 3220.03: 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, and club mosses. 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, and a variety of forms. The class may be useful to those students considering the teaching profession, graduate study or who are interested in broadening their general knowledge.

INSTRUCTOR: TBA

FORMAT: Lecture 2 hours, lab 3 hours

PREREQUISITE: BIOL 2002.03 or permission of the instructor

BIOL 3321.06 (BIOL 3301.03/3302.03B): 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. BIOL 3301.03/3302.03 Invertebrates Parts I and II are *only open* to Marine Biology Co-op students who are unable to take BIOL 3321.06 because of work-term schedules. These Co-op students must take both classes, normally 3301.03 in their 3rd year and 3302.03 in their 4th year. All other students should take BIOL 3321.06

INSTRUCTOR: M. Hart

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITE: One full credit in Biology at the 1000-level or SCIE 1500.30 (Grade of B- or better), 2001.03 (third- and fourth-year Geology students interested in paleontology may take this class without any previous biology classes)

BIOL 3322.03: Parasitology.

(May not be offered in 1998/99)

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.

INSTRUCTOR: E. Angelopoulos

FORMAT: Lecture 2 hours, lab 3 hours

BIOL 3324.03: Entomology.

(May be offered in Summer 1998)

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.

INSTRUCTOR: E. Angelopoulos

FORMAT: Lecture 2 hours, lab 3 hours

BIOL 3326.03: 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 3070.06/3071.06.

INSTRUCTOR: A.W. Pinder

FORMAT: Lecture 3 hours, tutorial 1 hour

PREREQUISITE: Biology second-year core

BIOL 3421.03: Comparative Vertebrate Histology.

An advanced histology course surveying the whole range of vertebrate tissues and organs.

INSTRUCTOR: M.M. Hansel (Anatomy and Neurobiology Dept)

FORMAT: Lecture 2 hours, lab 2 hours

PREREQUISITE: BIOL 3430.03

CROSS-LISTING: ANAT 3421.03

BIOL 3430.03: 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.

INSTRUCTOR: D.H. Dickson (Anatomy and Neurobiology Dept.)

FORMAT: Lecture 2 hours, lab 2 hours

PREREQUISITE: BIOL 2020.03 or permission of instructor

CROSS-LISTING: ANAT 2160.03

BIOL 3435.06: Anatomy.

A regional study of human gross anatomy with emphasis on functional anatomy of the back and limbs. Laboratory work/study includes osteology, living (surface) anatomy and dissection of the human body. Instructor's consent and signature are required.

INSTRUCTOR: R.W. Currie and R.J. Wassersug (Anatomy and Neurobiology Dept.)

FORMAT: Lecture 1 hour, lab 4 hours

PREREQUISITES: Must be in 3rd or 4th year and have a GPA of 3.00 (minimum). No formal prerequisites

CROSS-LISTING: ANAT 2170.06

BIOL 3440.03: 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.

INSTRUCTOR: H.H. Ellenberger and F.M. Smith (Anatomy and Neurobiology Dept.)

FORMAT: Lecture/lab 3 hours

PREREQUISITE: BIOL 2020.03 or permission of instructor

CROSS-LISTING: ANAT 2100.03, NESC 3440.03

BIOL 3502.03: The History of Modern Science.

Science became separated from general knowledge between about 1500 and the early 19th century. It has proved to be a remarkably powerful cultural force from the time of the first Scientific Revolution of the 17th century until our own times. This class examines the ways that science and scientists have given us knowledge of the natural world from the time of Copernicus to the development of evolutionary theory and relativistic physics in the 19th and 20th centuries. It is intended for students interested in interdisciplinary knowledge who are prepared for extensive reading.

INSTRUCTOR: E.L. Mills

FORMAT: Lectures 3 hours

CROSS-LISTING: HIST 3072.03, SCIE 4000.03

BIOL 3580.03: Philosophy of Biology.

See class description for PHIL 3420.03 in the Philosophy section of this calendar.

BIOL 3601.03: Nature Conservation.

(May not be offered in 1998/99)

The class 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.

INSTRUCTOR: M. Willison

FORMAT: Lecture 3 hours/tutorial 1 hour

PREREQUISITE: One full-credit in Biology at the 1000-level or SCIE 1500.30 or permission of instructor

EXCLUSION: BIOL 3410.03 taken in 91/92 or 92/93

CROSS-LISTING: ENVI 5008.03

BIOL 3614.03: Field Ecology.

This class provides practical experience in techniques of quantitative field ecology, including design of field sampling programmes and manipulative experiments. Students examine specific ecological questions by collecting, analyzing, and interpreting field data and by writing scientific reports. Projects include a variety of experimental and descriptive studies on plant and animal populations or communities in intertidal, lacustrine, and forest ecosystems. Lectures and field trips will involve other biology professors. Specific topics include spatial distributions of organisms, animal orientation and movement, disturbance and succession, lake trophic status, and function of behaviour. Instruction includes use of

PC and MacIntosh computer analysis packages (e.g. Excel, Cricketgraph) and techniques of scientific writing. Evaluation is based on written assignments and participation in field, lab, and data analysis. No exams are given. Prospective students must apply to the instructor prior to registration; fourth year Biology students have priority. A special fee is charged to cover costs of transportation (consult department regarding fees or to obtain an application).

SIGNATURE REQUIRED

INSTRUCTOR: C. Staicer

FORMAT: Combined lecture/lab for 3 hours per week, plus 8 days of field work in September (the two days after Labour Day and the following three weekends)

PREREQUISITE: BIOL 2060.03 and MATH 1060.03, and 2080.03 or equivalent

BIOL 3620.03: Field Survey of Terrestrial Biodiversity.

This summer class provides field experience with biodiversity survey techniques and practical experience in relating trends in biodiversity to natural and anthropogenic variation in terrestrial environments. Lectures will provide an overview of relevant concepts in biodiversity and ecology, as well as focused instruction on the ecology and taxonomy of particular groups of organisms such as lichens, mosses, higher plants, insects, amphibians, birds, and mammals. Students will take field trips to a variety of terrestrial habitats. At each site, students will gain experience with standard techniques used to quantify the biodiversity of different groups of terrestrial organisms. Students will learn to use Excel to tabulate and analyze data, and will write several reports based on the techniques used, the data collected, and the major biodiversity issues involved. Five days will be devoted to planning, conducting, writing-up, and presenting to the class an independent project of the student's own choice. Prospective students must fill out an application and pay a transportation fee to the department prior to registration (contact instructor or department for more information).

INSTRUCTOR: C. Staicer

FORMAT: Field intensive

PREREQUISITE: BIOL 1000.06 or equivalent introduction to ecology and the diversity of organisms

BIOL 3622.03: Ornithology.

The study of birds in their natural habitats will be the focus of this field-intensive summer class. Each day's activity will be either field trip, lecture, laboratory, or a combination of these, depending on weather. Lectures and laboratory exercises will complement field work and provide an overview of avian biology, from evolution and systematics to anatomy and physiology. A wide variety of field sites in Nova Scotia will be visited, including: Coniferous and deciduous forests of various types; coastal marsh, tide flats, beach, grassy dunes, and rock shore; freshwater lakes; and offshore islands. Students will keep a field notebook and prepare written reports summarizing field observations and addressing particular questions. Students will learn techniques for the scientific study of bird populations, including identification of species by sight and sound. Exams will test student comprehension of the lecture and laboratory material, as well as identification skills. For the last week of the class, students will design and conduct independent projects to test a functional hypothesis about the behaviour or ecology of birds. On the final day, students will present their work to the class in research seminar format. One week will be spent at various field camps; extra fees will be charged to cover costs of transportation and camping.

INSTRUCTOR: C. Staicer

FORMAT: Field intensive

PREREQUISITES: BIOL 2001.03 or 2002.03

BIOL 3623.03: Coastal Ecology

This summer class will provide students with field experience in various aspects of the ecology of near-shore marine systems. Class projects will include the following: The zonation of intertidal communities along the marine-terrestrial gradients of rocky shores, sandy beaches, and saltmarsh-tidal flats; the behaviours of intertidal animals; field experiments in marine ecology; and methodologies for ecological sampling and study design. Students will obtain

hands-on experience in measuring physical factors (e.g. wave action, desiccation, temperature, solar radiation, sediment structure) and biological interactions (e.g. predation, competition, facilitation) to determine how these relate to patterns of distribution and abundance of organisms. During the second half of the class, students will design, conduct, and present independent research projects. Field trips will leave from the university each day. This class carries an additional fee to cover the costs of transportation.
FORMAT: Field intensive
PREREQUISITES: 2001.03 and 2060.03

BIOL 3624.03: Freshwater Systems.

This field class will introduce students to the ecology of freshwater ecosystems. Field work will focus on the unique freshwater system consisting of Dollar Lake, Dollar Brook, and the Musquodoboit River, approximately 60 minutes north of Halifax. The first day will include lectures that provide an overview of freshwater ecology and some of the field and laboratory techniques to be used. Physical, chemical and biological features will be quantified and their inter-relationships studied. Students will learn a variety of field sampling methods for water quality and aquatic plant and animal populations. The final week will be devoted to independent research projects on some aspect of freshwater ecology. Students will present their results to the class and prepare a written report. Other assignments will include reports on group projects lead by the instructor. An exam will be given at the end of the second week to evaluate the students' comprehension of the material. The field work will be done from a field camp at Dollar Lake Provincial Park, and the laboratory work will be done at the university. An extra fee will be charged to cover the costs of transportation, food and camping.
FORMAT: Field intensive
PREREQUISITES: 2001.03 or 2002.03 and 2060.03

BIOL 3625.03: Paleoecology.

This field class will introduce students to ancient ecosystems and techniques for their study. The class will begin with a day of lectures on the history of life on earth and the characteristics of ancient ecosystems. Students will learn a methodology for interpreting the fossil record and then practice applying their skills in the field. Several days will be spent at each of three nearby sites that are internationally-renowned: Blue Beach, Parraborro, and Arisaig. Reading material for the class will consist of a handbook that includes copies of publications relevant to the paleoecology of the study sites. Students will be evaluated on their field notes and written interpretation they prepare for each study site. Establishment of student collections of identified fossils will be an integral part of the class. The final exam will involve the reconstruction of an ancient ecosystem based on fossil evidence and will test the students' analytical interpretation skills. Students will camp as a group during each week's field excursions. An extra fee will be charged to cover costs of transportation, food and camping.
PREREQUISITES: BIOL 2001.03 or 2002.03

BIOL 3630.03: Field Methods in Animal Behaviour.

This class provides first-hand experience in studying animal behaviour in the field, so that upon completion, students should be able to carry out field studies of their own. Topics include focusing questions, describing behaviour, choosing sampling regimes, and designing and conducting experiments. Lectures will provide background information, but most of the class will consist of day-long field projects that give students practical experience with each of the main topics. Specific exercises will involve various species from insects to mammals, and various behaviours, including visual signaling, foraging, and responses to playback to tape-recorded sounds. Students will also plan, conduct, write-up, and orally present a 5-day project of their own choice. Prospective students must fill out an application and pay a transportation fee to the department prior to registration (contact instructor or department for more information). All students must have the instructor's permission before they can register for this class.
SIGNATURE REQUIRED
INSTRUCTOR: A. Horn
FORMAT: Field intensive
PREREQUISITE: BIOL 3062.03 (or other animal behaviour class)

BIOL 4010.03: Genes and Genomes.

See class description for BIOC 4403.03, in the Biochemistry section of this calendar.

BIOL 4011.03: Gene Expression.

See class description for BIOC 4404.03, in the Biochemistry section of this calendar.

BIOL 4012.03: Advanced Laboratory in Biochemical Techniques.

See class description for BIOC 4603.03, in the Biochemistry section of this calendar.

BIOL 4024.03: 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 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.

INSTRUCTOR: G.T. Faulkner, L. Frotten-Maillet, D.B. Stoltz

FORMAT: Lecture 3 hours, no formal lab

PREREQUISITE: Instructor's consent

CROSS-LISTING: MICR 4024.03/5024.03, BIOL 5024.03

BIOL 4060.03: 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. Students will use information on the biology of marine mammals to explore conservation/management issues.

INSTRUCTOR: H. Whitehead

FORMAT: Lectures 3 hours

PREREQUISITE: BIOL 2060.03

CROSS-LISTING: BIOL 5651.03

BIOL 4061.03: 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 analyzed 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.

INSTRUCTOR: R. Scheibling, H. Whitehead

FORMAT: Lecture 3 hours

PREREQUISITES: STAT 2080.03; offered to well prepared honours students as well as graduate students

CROSS-LISTING: BIOL 5061.03

BIOL 4068.03: Limnology.

The class is divided into three sections: (A) Physical and Chemical Limnology — geology, morphometry, thermal properties, system hydrology & budgets, optical properties, oxygen, acidity/alkalinity, physical/chemical interactions, major/minor ions and heavy metals, organic molecules, ionic budgets and mass balances; (B) Biological limnology — paleolimnology, microbiology/phytoplankton, quantitative geochemistry, zooplankton/invertebrates, vertebrates, sampling technology; (C) Applied limnology — eutrophication, acid rain, water pollution.

INSTRUCTOR: P. Lane

FORMAT: Lecture 3 hours, lab/tutorial 3 hours

PREREQUISITE: BIOL 2060.03

BIOL 4070.03: Advanced Topics in Animal Physiology.

Whereas the introductory animal physiology classes emphasize common principles, this class emphasizes the diversity of physiological solutions to common problems among animals. Several different problems are chosen each year and each student presents two seminars reviewing the literature of particular animals' solutions. The student also writes a short term paper based on one of their presentations.

INSTRUCTOR: S.J. Iverson, R.K. O'Dor, A. Pinder

FORMAT: Lecture 2 hours

PREREQUISITE: BIOL 3070.03 or 3071.03

CROSS-LISTING: BIOL 5070.03

BIOL 4074.03: Introduction to Animal Nutrition.

This class is based on the text book: Animal Nutrition, 7th edition, by Maynard, Loosli, Huintz and Warner, McGraw-Hill Co. There will be an introduction to the history of nutritional sciences, nutrition research techniques and focus on vitamin, mineral, lipid, protein, amino acid and carbohydrate requirements.

INSTRUCTOR: Nancy Irwin

FORMAT: Lecture, lab

BIOL 4075.03: Nutrition in Aquaculture.

(May be offered in Summer 1998)

The focus will be on application of nutrition to fish, crustacean and molluscan culture. Topics will include lipids and essential fatty acids, macro and trace elements, vitamins, proteins and bioenergetics, carbohydrates, and digestion in aquatic animals.

INSTRUCTOR: Nancy Irwin

FORMAT: Lecture, lab

PREREQUISITE: BIOL 4074.03

BIOL 4101.03: 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 process is a key component.

INSTRUCTOR: M. Silver

FORMAT: Lecture/seminar 2 hours

PREREQUISITE: BIOL 2101.03 or MICR 2100.03

BIOL 4103.03: Infectious Diseases of Aquatic Organisms.

(May not be offered in 1998/99)

Infectious disease is a significant factor in the successful development of aquaculture. Each candidate species for aquaculture is sensitive to many types of pathogens. Studies of host-pathogen interactions attempt to understand the immunity of the host in relation to virulence factors of pathogens. This class will examine a variety of pathogens (in particular, viral, bacterial, fungal, protozoan and metazoan pathogens) with emphasis on disease prevalence, diagnosis, control and pathogen identification using traditional and biotechnical methods. Immune systems of invertebrates and vertebrates will be discussed.

INSTRUCTOR: D. Stolz, R. Brown, D. Strongman, D. Cone

FORMAT: Lecture/seminar

PREREQUISITE: One third year class in Microbiology

CROSS-LISTING: BIOL 5103.03, MICR 4103.03

BIOL 4113.03: Biology of the Prokaryotic Cell.

(May not be offered in 1998/99)

This class concentrates on the structure and function of the bacterial cell envelope, that is, the capsule, cell wall and cell membrane. Some coverage of the archaeobacteria and bacteria as pathogens is given. students will write one essay.

INSTRUCTORS: R. Brown, G. Johnston, P. Hoffman

FORMAT: Lecture 2 hours

PREREQUISITES: MICR 2100.03 or BIOL 2101.03 and CHEM 2400.06 or BIOL 2010.03

BIOL 4302.03: Molecular Immunology.

(May not be offered in 1998/99)

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.

This class is offered on alternate years to MICR/BIOL 4303.03.

INSTRUCTOR: T. Lee, A.W. Stadnyk

FORMAT: Lecture/student presentations/discussion

PREREQUISITE: MICR 3115.03 and/or instructor's consent

CROSS-LISTING: MICR 4302.03/5302.03, BIOL 5302.03

BIOL 4303.03: Granulocytes and the Immune Response.

An advanced class dealing with the contribution of granulocytes to immunologic function. Mast cells, basophils, neutrophils, macrophages, NK cells and eosinophils will be considered with respect to their unique functions and contribution to a variety of immune effector mechanisms. This class is offered on alternate years to MICR 4302.03/BIOL 4302.03.

INSTRUCTOR: T. Lee, A.W. Stadnyk, B. Pohajdak

FORMAT: Lecture/student presentations/discussion

PREREQUISITE: MICR 3115.03 and/or instructor's consent

CROSS-LISTING: MICR 4303.03/5303.03, BIOL 5303.03

BIOL 4321.06: Human Cell Physiology

See class description for PHYL 4321.06 in the Physiology section of this calendar.

BIOL 4369.03: Fisheries Oceanography.

See class description for OCEA 4160.03, in the Oceanography section of this calendar.

BIOL 4404.03: 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.

INSTRUCTOR: H. Robertson, J. Blay

FORMAT: Lecture 3 hours

CO-REQUISITE/PREREQUISITE: Upper level physiology or instructor's consent.

CROSS-LISTING: PHAC 5406.03, BIOC 4804.03, NESC 4374.03

BIOL 4405.03: Introduction to Pharmacology II.

This class is intended to cover specific aspects of drug action in greater depth than BIOL 4404.03 and to provide students with practical expertise in pharmacology. The laboratory component consists of prescribed exercises using varied techniques. Instructor's consent and signature are required.

INSTRUCTOR: TBA

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITE: BIOL 4404.03

CROSS-LISTING: PHAC 5407.03, BIOC 4805.03, NESC 4375.03

BIOL 4600.03: 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.

INSTRUCTOR: TBA

FORMAT: Lecture/discussion 3 hours

PREREQUISITES: BIOL 2001.03, 2060.03, and 3321.06; fundamental knowledge of statistics; or instructor's consent

CROSS-LISTING: OCEA 4600.03/5600.03, BIOL 5600.03

BIOL 4660.03: Principles of Biological Oceanography.

See class description for OCEA 4150.03, in the Oceanography section of this calendar.

BIOL 4664.03: History of Marine Sciences.

See class description for SCIE 4001.03 in the Science, Interdisciplinary section of this calendar.

BIOL 4666.03: Benthic Ecology.

See class description for OCEA 4330.03, in the Oceanography section of this calendar.

BIOL 4800.06: Special Topics.

Available as 4806.03, 4807.03B, 4808.03R. These classes involve independent study and are intended for fourth-year students who wish to study an area of biology not covered in other classes. The topic of study must be different from the student's honours thesis. Students should first consult with a faculty member to arrange the topic of study. An outline of the course content must be submitted to and approved by the chair of the curriculum committee. Only the Chairperson of the Curriculum Committee can sign the approval form.

BIOL 8880.00: Honours Qualifying Examination.

This is an additional requirement required of all Biology and Marine Biology honours students. The Pass/Fail grade is based on attendance at Honours student seminars for two academic terms normally during their 4th year. Marine Biology Co-Op students who are on work terms during the Fall term of their 4th year can attend during the B term of their 4th year and A term of their 5th year.

BIOL 8891.00: Co-op Work Term I.

BIOL 8892.00: Co-op Work Term II.

BIOL 8893.00: Co-op Work Term III.

BIOL 8894.00: Co-op Work Term IV.

BIOL 4900.06: Honours Research and Thesis.

Compulsory class in Biology and Marine Biology honours programmes.

INSTRUCTOR: P. Collins, A. Pinder

FORMAT: Student seminars

RESTRICTION: Restricted to final year honours students

SCIE 3000.06: Science Fundamentals.

See class description in Science, Interdisciplinary section of this calendar.

SCIE 8700.00B: Co-op Seminar (non-credit).

III. Marine Biology

A. 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. We also offer these two degrees in a Co-operative Education format 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 for the preparation of a 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.

B. Co-operative Education Programme in Marine Biology, Honours and Advanced Major

Programme Co-ordinator: M.J. O'Halloran (494-2136)

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, enable students to apply their knowledge of marine biology and provide them with work experience for making intelligent career choices. Upon successful completion of the programme, the student's transcript indicates that the degree was co-operative in format. 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	May Graduation	

AT = Academic term

WT = Work Term

The Faculty's Co-op Placement Officers serve to co-ordinate the contacts between students and employer. Students are remunerated according to employers' policies on 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 those for the non co-op programme (listed below). Students in the third and fourth year of their co-op programme will have difficulty taking R-term classes during the academic year because of their work terms. The two required full-credit third-year biology classes (BIOL 3321.06 and 3071.06) are 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.

During their second year Co-op students must attend a non-credit seminar class to prepare them for their work term placements.

To ensure employment opportunities, it is recommended that co-op students include some classes (or minor) in biochemistry, business, computer science, environmental science, or microbiology as employers are often seeking expertise in these areas.

Admission

Admission to the programme should be sought before entering the second year of study. Application forms are available from the Marine Biology Co-op Co-ordinator.

A limited number of students will be accepted into the programme each year to reflect the current job availability. Students must be Canadian citizens or landed immigrants. Students wishing to apply for the Honours and Advanced Major Co-op programmes should have at least an overall GPA of 3.00 or higher from all first year classes and a grade of B+ in BIOL 1000.06 or equivalent. Successful applicants will be informed at the beginning of the fall term.

C. Honours in Marine Biology

Programme Advisor: M.J. O'Halloran (494-2136)

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).

It is the responsibility of all students to arrange for supervisors for their research. Honours theses may be supervised by a faculty member within the Biology department, or by an external scientific investigator, subject to the approval of the honours committee. Students not in co-op should begin to search for a potential supervisor during their 3rd year of study and should have completed arrangements by May of their 3rd year. Co-op students will normally do their Honours research in the summer of their 4th year or in their 5th year and should consult with their advisor. If students wish to be supervised by someone external to the department, they must consult with their honours advisor to determine the potential supervisor's eligibility prior to starting their research.

For the standing required for Honours please see "Graduation Standing" section "Academic Regulations" given earlier in this calendar.

PLEASE NOTE: Our department requires marine biology honours students to obtain a B average (GPA 3.00) in the following second-year classes:

- BIOL 2001.03
- BIOL 2020.03
- BIOL 2030.03
- BIOL 2060.03.

These classes must normally be completed by the end of second year.

Departmental Requirements

1000 level

- BIOL 1000.06

2000 level

- BIOL 2001.03
- BIOL 2020.03
- BIOL 2030.03
- BIOL 2060.03

3000 level

- BIOL 3071.06 or 3074.03/BIOL 3076.03
- BIOL 3067.03
- BIOL 3211.03 or 3212.03
- BIOL 3321.06 or 3301.03/3302.03

4000 level

- BIOL 4900.06
- Honours Qualifying exam (pass/fail grade based on participation in BIOL 4900.06)

Note that at least nine credits in the major subject must be taken for an honours degree.

Other required classes

- CHEM 1040.06
- COMP 1000.03
- MATH 1000.03
- MATH 1060.03
- OCEA 2850.06 or 2851.03/2852.03
- STAT 2080.03

Suggested biology credits and electives

The following third and fourth year classes are marine related and should 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 Honours Advisor first.

Students interested in a career in Aquaculture should take the classes listed under Aquaculture below plus some commerce/business classes. See the Marine Biology advisor for more information.

All students should ensure they have the necessary pre-requisite classes for entry into higher level classes.

1. Aquaculture
 - BIOL 4600.03: Invertebrate fisheries and aquaculture
 - BIOL 4103.03: Infectious Diseases of Aquatic Organisms
 - BIOL 4075.03: Nutrition In Aquaculture
2. Development
 - BIOL 3050.03: Developmental biology
3. Animal Diversity
 - BIOL 3067.03: Ecology and Evolution of Fishes
 - BIOL 3326.03: Vertebrates and evolution
 - BIOL 4080.03: Marine Mammalogy
4. Ecology
 - BIOL 3061.03: Communities and ecosystems
 - BIOL 3063.03: Resource ecology
 - BIOL 3069.03: Population ecology
 - BIOL 4061.03: Expt'l design
 - BIOL 4666.03: Benthic ecology
5. Earth Sciences
 - EARTH 4280.03: Marine geophysics
6. Evolution
 - BIOL 3041.03: Evolution
7. Environmental Science
 - BIOL 3080.03: Environmental Ecology
 - BIOL 3081.03: Communities and Ecosystems
 - BIOL 3601.03: Nature Conservation
 - PHIL 2480.03: Environmental Ethics
 - ENVI 5032.03: Aquatic Toxicology*
 - ENVI 5008.03: Environmental Toxicology*
 - SCIE 1000.06: Introduction to Environmental Studies

* can be taken as a Biology Special Topics (4800) undergraduate credit.
8. Microbiology
 - BIOL 3100.03: Aquatic microbiology
9. Oceanography
 - BIOL 4369.03/OCEA 4160.03: Fisheries Oceanography
 - BIOL 4600.03/OCEA 4600.03: Invert. Fisheries and Aquaculture
 - BIOL 4660.03/OCEA 4150.03: Principles of Biological Oceanography
 - BIOL 4662.03/OCEA 4230.03: Biology of phytoplankton
 - BIOL 4664.03/OCEA 4331.03: History of Marine Science
 - OCEA 3000.03: The Atmosphere
 - OCEA 3170.03: Physics and Chemistry of the Ocean Science
 - BIOL 4666.03/OCEA 4330.03: Benthic Ecology
 - OCEA 4260.03: Biology of Zooplankton
10. Limnology
 - BIOL 4068.03: Limnology
11. Physics
 - PHYC 1300.06: Physics in and around you
12. Physiology
 - BIOL 4070.03: Advanced topics in animal physiology
13. Political Science
 - POLI 3589.03: Politics of the Sea
14. Resource Management/Economics
 - BIOL 3063.03: Resource ecology
 - ECON 361.1(2): Fisheries economics (offered at St. Mary's University).
15. Science
 - SCIE 3000.06: Science fundamentals
16. Biology field class
 - (0.5 credit) offered at a recognized field station (see advisor for information).

Class at Saint Mary's University

Fisheries Economics 361.1(2):

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, socioeconomics, 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 1997-98)

INSTRUCTOR: T. Charles

FORMAT: Classes 1.5 hours, seminars 1.5 hours a week in B term

PREREQUISITE: Instructor's consent. An introductory economics class would be useful

D. Honours Co-op in Marine Biology

Departmental Requirements

Same as for regular Marine Biology Honours as above in addition to the following:

- SCIE 8700.00 (Co-op Seminar),
- BIOL 8891.00, 8892.00, 8893.00, 8894.00 (Co-op Work terms).

Co-op students will normally do their Honours research in the summer of their 4th year or in their 5th year and should arrange this with the Honours advisor. If students wish to be supervised by someone external to the department, they must consult with the honours advisor, prior to starting the research, to determine supervisor and project's eligibility. The Honours Seminar (BIOL 4900.06) will normally be taken in two parts to accommodate students' work terms; Part 1 in B term of 4th year and Part 2 in A term of 5th year.

Suggested Biology credits or electives

Same as for regular Marine Biology Honours listed above.

E. Advanced Major in Marine Biology (4 year)

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.

Classes required in Advanced Major

1000 level

- BIOL 1000.06

2000 level

- BIOL 2001.03
- BIOL 2020.03
- BIOL 2030.03
- BIOL 2060.03

3000/4000 level: Minimum of four (4) credits to be selected from these classes with strong marine emphasis:

BIOL 3063.03	BIOL 4074.03
BIOL 3067.03	BIOL 4075.03
BIOL 3071.06	BIOL 4103.03
BIOL 3100.03	BIOL 4369.03
BIOL 3211.03	BIOL 4600.03
BIOL 3212.03	BIOL 4660.03
BIOL 3321.06	BIOL 4664.03
BIOL 4060.03	BIOL 4666.03.

Other required classes

- CHEM 1040.06
- COMP 1000.03
- MATH 1000.03
- MATH 1060.03

Useful electives

These can be selected from those listed earlier in the Marine Biology Honours programme.

F. Advanced Major Co-op in Marine Biology

Departmental Requirements

Same as for regular Advanced Major in Marine Biology as above in addition to the following:

- SCIE 8700.00 (Co-op Seminar),
- BIOL 8891.00, 8892.00, 8893.00, 8894.00 (Co-op Work terms)

Canadian Studies

Location: Multidisciplinary Centre
1444 Seymour Street
Halifax, Nova Scotia B3H 3J5
Telephone: (902)494-3814
Fax: (902)494-2105

Dean

Taylor, G.D., BA, PhD (Penn)

Coordinator

Bednarski, B. - (494-3814/6803)

Faculty

Apostle, R. (Sociology and Social Anthropology)
Bednarski, B. (French)
Bradfield, M. (Economics)
Burns, S.A.M. (Philosophy)
Butler, P. (Sociology and Social Anthropology)
Cameron, D. (Political Science)
Clairmont, D. (Sociology and Social Anthropology)
Cross, M. (History)
Finbow, R. (Political Science)
Kemp, W. (Music)
Lesser, B. (Economics)
Miller, V. (Sociology and Social Anthropology)
Monk, P. (English)
Oore, I. (French)
Overton, D. (Theatre)
Runte, H. (French)
Faulkner, C.T. (Comparative Religion)
Smith, J. (Political Science)
Sutherland, D. (History)
Taylor, G. (History)
Tillotson, S. (History)
Wainwright, J.A. (English)

The Canadian Studies Programme

I. Introduction

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 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. Students are encouraged to take CANA 1100.06 at Mount Saint Vincent University in their first or second year, and all students in the Canadian Studies programme must take the half-credit interdisciplinary seminar, CANA 3000.03 at Dalhousie. 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 fulfill the Canadian-content requirements of this programme will have the words With An Emphasis in Canadian Studies on their transcript upon graduation.

II. Requirements

- 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 1200.06 if available), and in either Political Science or Sociology and Social Anthropology. (Prospective Economics majors may substitute an introductory class here).
- It is highly recommended that students take the Mount Saint Vincent class CANA 1100.06 (see description below, p.) in their first or second year. This class can be taken by letter of permission (see Academic Regulation 8.5), and it can be substituted for one of the three Dalhousie Canadian-content classes required under c) below.
- 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 must take at least one half-credit class in three different disciplines from among the approved classes in Comparative Religion, Economics, English, French, History, Music, Political Science, Sociology and Social Anthropology and Theatre listed below. It is understood that students will take at least one full-credit Canadian content class in their major discipline.
- In their third or fourth year, students must also take the required Dalhousie interdisciplinary seminar, CANA 3000.03, described below.

III. Classes

NOTE: Classes marked * are not offered every year. Please consult the current timetable to determine this year's offerings.

CANA 3000.03: Seminar in Canadian Studies.

An interdisciplinary seminar for 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 the required number of Canadian-content classes to obtain the Emphasis in Canadian Studies, and who have, where possible, already taken Mount Saint Vincent CANA 1100.06 described below.

NOTE: CANA 3000.03 is also open, as an elective class, to Faculty of Arts and Social Sciences students with an interest in Canadian Studies who may not complete the Canadian-content requirements.

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 Comparative Religion, English, French (in translation), History, Music, Philosophy, Political Science, Sociology and Social Anthropology and Theatre. 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. Students must consult with the Canadian Studies Coordinator before enrolling in the seminar.

INSTRUCTORS: R. Apostle, B. Bednarski, S.A.M. Burns, P. Butler, D. Cameron, M. Cross, T. Faulkner, R. Finbow, W. Kemp, V. Miller, P. Monk, I. Oore, D. Overton, J. Smith, H. Runte, G. Taylor, J.A. Wainwright

FORMAT: Seminar/Discussion

CO-REQUISITE: Canadian-content classes in Comparative Religion, Economics, English, French, History, Music, Political Science, Sociology and Social Anthropology, Theatre

HIGHLY RECOMMENDED: Mount Saint Vincent CANA 1100.06

1. Comparative Religion Classes Approved with Canadian Studies

- COMR 3003.06: Religion in Canada

2. Economics Classes Approved with Canadian Studies

- *ECON 2232.06: Canadian Economic History

- *ECON 3317.03: Poverty and Inequality
- *ECON 3326.03: Money and Banking
- ECON 3332.03: Resource Economics
- *ECON 3336.03: Regional Development
- *ECON 4426.03: Monetary Policy

Other Economics classes that deal with Canadian issues are available. Students should consult with the Chair and with the Coordinator of Canadian Studies.

3. English Classes Approved with Canadian Studies

- *ENGL 2207.06: Canadian Literature
- *ENGL 4357.06: Honours Seminar in Canadian Literature

4. French Classes Approved with Canadian Studies

- FREN 2021.03/FREN 2022.03: Études pratiques/Practice in Language Skills (This is a multi-section class. Check with the French Department to determine which sections have Canadian content.)
- FREN 2203.03: Approches du texte littéraire/ Approaches to Literary Texts
- *FREN 3025.03: Les Parlers acadiens: Introduction linguistique/Linguistic Introduction to Acadian Dialectology
- *FREN 3900.03/FREN 3901.03: La littérature canadienne-française/French Canadian Literature
- *FREN 3910.03: Études acadiennes/Acadian Studies
- *FREN 4902.03: Écrivains québécois contemporains/Contemporary Quebec Writers
- *FREN 4904.03: Écrivaines québécoises/Quebec Women Writers

5. History Classes Approved with Canadian Studies

- HIST 1200.06: Canada: An Introductory Survey
- *HIST 2202.03: Canada's Industrial Revolution, 1850-1950
- HIST 2211.03: Social History of Canada Before 1870
- HIST 2212.03: Social History of Canada Since 1870
- HIST 2221.03: Rough Justice: Order, Disorder and Canadian Popular Culture, to the 1890's
- HIST 2222.03: Rough Justice: Order Disorder and Canadian Popular Culture, 1890 to Present
- HIST 2230.06: Canada in the Twentieth Century
- HIST 2270.06: The Atlantic Provinces
- *HIST 3220.03: Youth Culture in Canada, 1950's to 1970's
- *HIST 3222.03: Topics in Canadian Social History, 19th and 20th Centuries
- *HIST 3225.03: Crime, Punishment and the Criminal Law in Canadian Society
- *HIST 3245.03: French Canada
- *HIST 3255.03: The Age of MacDonald and Laurier
- *HIST 3260.03: History of the Canadian West
- *HIST 3261.03: The Rural Experience in Canada
- *HIST 3272.03: Themes in the History of Atlantic Canada
- HIST 3273.03: Nova Scotia: Pre-Confederation
- HIST 3274.03: Nova Scotia: Post-Confederation
- *HIST 3286.03: The Urban Experience in Canada
- *HIST 3292.03: Wealth and Power in North America
- *HIST 3302.03: Technology and History in North America
- *HIST 3750.03: History of Seafaring

PLEASE NOTE: 3000-level classes have prerequisites which apply to Canadian Studies students as well as History majors.

6. Music Classes Approved with Canadian Studies

- MUSC 3362.03: Music in Canada to 1950
- MUSC 3364.03: Women in Canadian Music

7. Political Science Classes Approved with Canadian Studies

- POLI 2200.06: Canadian Government and Politics
- *POLI 3205.03: Canadian Political Thought
- POLI 3216.03: Local and Regional Government
- POLI 3220.03: Intergovernmental Relationships in Canada

- *POLI 3224.03: Canadian Political Parties
- *POLI 3235.03: Regional Political Economy in Canada
- *POLI 3245.03: The Judicial System and Canadian Government
- *POLI 3250.03: Canadian Public Administration
- POLI 4240.03: Policy Formulation in Canada
- POLI 4241.03: Introduction to Policy Analysis

8. Sociology and Social Anthropology Classes Approved with Canadian Studies

- *SOSA 3008.03: Canadian Society and Politics

PLEASE NOTE: 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.

9. Theatre Classes Approved with Canadian Studies

- THEA 4500.03: Canadian Drama
- THEA 4501.03: The History of Canadian Theatre

10. Mount Saint Vincent Class Approved with Canadian Studies (with Registrar's Letter of Permission)

- MSVU CANA 1100.06: Canadian Culture and Society. An interdisciplinary class providing students with a general overview and understanding of Canadian civilization and the forces which shaped it and are likely to continue doing so. Students learn to integrate certain basic concepts about Canada as employed by a number of academic disciplines.
FORMAT: Lecture

Chemistry

Location: Chemistry Building, Second Floor
Halifax, NS B3H 4J3
Telephone: (902) 494-3305
Fax: (902) 494-1310
E-mail: dalchem@is.dal.ca

Interim Dean

Ryall, P.J.C., BSc (Dal), MSc (Alta), PhD (Dal), Associate Professor
(Earth Sciences)
Telephone: (902) 494-3540

Chairperson of Department

Boyd, R.J.

Faculty Undergraduate Advisors

Cameron, T.S. (494-3759)
Forrest, T.P. (494-3315)
Grossert, J.S. (494-3314)
Grundy, K.R. (494-3409)
Guy, R.D. (494-7079)
Hooper, D.L. (494-3322)
Kusalik, P.G. (494-3627)
Pacey, P.D. (494-3334)
Pincok, J.A. (494-3324)
Stephens, R. (494-7075)
Warren, C.H. (494-3323)

Professors Emeriti

Knop, O., DSc (Laval), FCIC, Harry Shirreff Professor of Chemical
Research
Ryan, D.E., BSc (UNB), MA (Tor), PhD, DSc (Lond), DIC, FCIC

Professors

Arnold, D.R., BS (Bethany College), PhD (Roch), FCIC, Alexander
McLeod Professor of Chemistry
Aue, W.A., PhD (Vienna), FCIC
Boyd, R.J., BSc (UBC), PhD (McG), FCIC, Faculty of Science Killam
Professor of Chemistry
Burford, N., BSc (Wales), PhD (Calgary)
Cameron, T.S., BA, MA, DPhil (Oxon)
Chart, A., BSc (Calcutta), MSc (Roorkee), MSc (Wat), PhD (Tor),
FCIC
Coxon, J.A., MA (Cantab), MSc, PhD (East Anglia)
Dahn, J.R., BSc (Dal), MSc, PhD (UBC), NSERC/3M Canada Inc.
Industrial Research Chair, cross-appointment with Physics
Forrest, T.P., BSc (MtA), MSc (Dal), PhD (UNB)
Grindley, T.B., BSc, MSc, PhD (Queen's), FCIC
Grossert, J.S., BSc, MSc, PhD (Natal), FCIC
Kwak, J.C.T., BSc, MSc, PhD (Amsterdam), FCIC
Pacey, P.D., BSc (McG), PhD (Tor), FCIC
Pincok, J.A., BSc, MSc (Man), PhD (Tor), FCIC
Ramaley, L., BA (Col), MA, PhD (Prin), FCIC
Stephens, R., MA (Cantab.), MSc (Bristol), PhD (London), DIC
Wasyliushen, R.E., BSc (Wat), MSc, PhD (Man), FCIC, Faculty of
Science Killam Professor of Chemistry
White, M.A., BSc (Western), PhD (McM), FCIC, Killam Research
Professor of Materials Science

Associate Professors

Grundy, K.R., BSc, MSc Hons, PhD (Auckland)
Guy, R.D., BSc (SFU), PhD (Carl)
Hooper, D.L., BSc, MSc, PhD (UNB), FCIC

Kusalik, P.G., BSc (Lethbridge), MSc, PhD (UBC), (NSERC
University Research Fellow)
Warren, C.H., BSc (Western), PhD (McM)
Wentzell, P.D., BSc (Dal), PhD (Mich State)
White, R.L., BSc (Dal), PhD (McM), FCIC

Assistant Professors

Cozens, F.L., BSc (York), PhD (Tor), (NSERC Women's Faculty
Award)
Schepp, N.P., BSc, PhD (Tor)

Visiting Scientists (1997)

DeCosta, D.P., University of Colombo, Sri Lanka
Kicentuk, J.W., Fisheries and Oceans Canada, St. John's, NF

Senior Instructors

Barkhouse, S.A., BSc (MSVU), BEd, MBA (Dal)
Byers, C.M., BSc Hons (Dal)
Gabor, J., MSc (Budapest)
Schepp, N.P., BSc, PhD (Tor)
Silvert, D.J., MSc (CWRU)
Thompson, K.E., BSc (Acadia), MBA (SMU)
Warren, M.E., BSc (Western)

Adjunct Professors (1997)

Boyd, R.K., BSc, PhD (St. Andrew's), FCIC, National Research
Council, Institute for Marine Biosciences
Curtis, J.M., BSc (Southampton), MSc (Guelph), PhD (Swansea),
National Research Council, Institute for Marine Biosciences
Marangoni, D.G., BSc (Acadia), PhD (Dal), St. Francis Xavier
University
Thibault, P., BSc, PhD (Montreal), National Research Council,
Institute for Marine Biosciences

Postdoctoral Fellows and Research Associates/ Assistants (1997)

Bogdonova, R.S., BSc (HIP Inst., Shumen, Bulgaria)
Cordes, R.E., BSc (Dal), MSc (UBC)
Dimitrijevic, S.T., PhD (Belgrade)
Eichele, K.O., BSc, PhD (Tübingen)
Furue, H., BSc, MSc (Osaka), PhD (Queen's)
Gonzalez, L., Autonomous University of Madrid
Goodwin, W.E., BSc (Mt. A.), PhD (Dal)
Jewett, B.N., BSc (UNB), MSc (Dal)
Heard, G.L., BSc (Melbourne), PhD (Tasmania)
Kwiatkowski, W., MSc, PhD (Lodz)
LeBlanc, D.J., BSc (St. F.X.), PhD (McMaster)
Lowery, N.B., BSc, PhD (Dal)
Li, M., PhD (Dal)
McManus, K.A., BSc, PhD (Dal)
Ordon, P., Technical University of Wroclaw
Otto, S., University of Groningen
Pincok, A.L., BSc, MSc (Man), BFA (NSCAD)
Rockwell, G.D., BSc (Acadia), MSc (Dal)
Singh, H., BSc (Guyana), PhD (Dal)
Smith, K.C., BSc (Queens), MSc (Dal)
Stringfellow, T.C., BA (Indiana State), PhD (Wisconsin)
Svishchev, I.M., MSc, PhD (Moscow)
Wan, Q.-H., BSc (Hongzhou), PhD (Edinburgh)
Zhang, W., BSc (Nanjing Univ.), PhD (Dal)

I. Introduction

Chemistry is the fundamental science that 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 the properties of the many substances they form. 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 industry or for an academic career.

Chemistry 1011.03/1012.03, 1021.03/1022.03, 1041.03/1042.03 are an introduction to the discipline. All students intending to take classes in chemistry beyond the first-year level should include classes in mathematics (Math 1000.03/1010.03) and physics (PHY 1100.06 or 1300.06 but NOT PHYC 1000.06) in their first year. Final grades in these classes should not be less than C; if they are, the student is very likely to find advanced classes in chemistry difficult and frustrating.

At the 2000 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 provides a means of understanding the physical properties of matter and the processes of its transformations, both at the macroscopic and molecular levels. Beyond the 2000 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.

II. 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. It qualifies such graduates for membership in the CSC and to practice chemistry as professionals.

See "Degree Requirements" section for complete details.

A. 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 the Honours Student Advisor and obtain approval of their class selection.

All eleven credits (the major and minor) of the Honours BSc must be passed with a grade of at least C.

Departmental Requirements

1000 level

- CHEM 1011.03/1012.03 (or equivalent)

2000 level

- CHEM 2101.03
- CHEM 2201.03
- CHEM 2301.03
- CHEM 2302.03
- CHEM 2401.03/2402.03

3000 level

- CHEM 3101.03 or 3102.03
- CHEM 3201.03
- CHEM 3301.03
- CHEM 3302.03
- CHEM 3401.03
- CHEM 3880.00

4000 level

- CHEM 4880.00
- CHEM 4901.06
- Honours qualifying examination (8880.00)

The remaining five 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 3101.03, or 3102.03, 4101.03, 4102.03
- B. CHEM 3202.03, 4201.03, 4202.03, 4203.03
- C. CHEM 3303.03, 4301.03, 4304.03, 4305.03, 4306.03
- D. CHEM 3402.03, 3403.03, 4401.03, 4402.03, 4403.03
- E. CHEM 3501.03, 4501.03, 4502.03, 4503.03, 4504.03

Other required classes

- MATH 1000.03
- MATH 1010.03
- MATH 2001.03/2002.03 or equivalent
- PHYC 1100.06

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, Economics, Marine Biology, Mathematics, Microbiology and Immunology, Neuroscience, Physics, Psychology, or Statistics. The minor, the unspecified credits in chemistry, and electives should be chosen according to the future plans of the student.

B. 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, Economics, Marine Biology, Mathematics, Microbiology and Immunology, Neuroscience, Physics, Psychology, or Statistics. To obtain an introduction to all the basic areas of chemistry, CHEM 2101.03, 2201.03, 2301.03, 2302.03, 2401.03, and 2402.03 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 the Honours Student Advisor of the Department of Chemistry and the Chair of the other area of study before registering in the combined programme. Students should also consult the Department's Handbook "Undergraduate Studies in Chemistry" for more information.

C. Advanced Major in Chemistry

Departmental Requirements

1000 level

- CHEM 1011.03/1012.03 (or equivalent)

2000 level

- CHEM 2101.03
- CHEM 2201.03
- CHEM 2301.03
- CHEM 2302.03
- CHEM 2401.03/2402.03

3000 level

- CHEM 3101.03 or 3102.03
- CHEM 3201.03
- One half credit from CHEM 3301.03, 3302.03, 3303.03, 3401.03, 3402.03
- The additional 2.5 credits minimum can be selected from the remaining 3000 and 4000 level Chemistry classes.

All Chemistry classes must be passed with a grade of at least C.

Other required classes

- MATH 1000.03
- MATH 1010.03
- Full credit in 2000 level MATH
- PHYC 1100.06 or equivalent.

D. 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, Economics, Marine Biology, Mathematics, Microbiology and Immunology, Neuroscience, Physics, Psychology, Statistics. To obtain an introduction to all the basic areas of chemistry, CHEM 2101.03, 2201.03, 2301.03, 2302.03, 2401.03 and 2402.03 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 the Chair of the Undergraduate Studies Committee in the Department of Chemistry and the Chair of the other area of study before registering in the programme. Students should also consult the Department's Handbook "Undergraduate Studies in Chemistry" for more information.

E. Co-operative Education Programme in Chemistry

This programme is intended to provide students with practical training for careers in industry and in government laboratories. Students are expected to acquire excellent laboratory skills, augmented by a knowledge of computers, electronics and statistics. Their training will be broadened by proper choice of electives, which can lead to further computer skills, to experience in biological laboratory techniques, to physics, engineering, or the earth sciences. As Chemistry is the science on whose foundations most other scientific endeavours rest, this training will equip students for work in a wide range of activities. These include production and plant management, product and process development, basic research in many areas including medicine, agriculture or manufacturing, environmental analysis and regulation, database development and management, marketing and customer service. Chemists work for large and small industries, for consulting companies, patent offices, legal offices and teaching institutions, for government laboratories or as self-employed consultants.

In addition to a wide range of chemical skills, students will acquire expertise in statistics and computer use, especially for spreadsheets and databases, to equip them for work in modern environments which stress Total Quality Management and ISO 9000 standards.

The normal academic goal of this programme will be a 20-credit, advanced major BSc degree, augmented by four supervised work-terms, spread over a period of 52 months.

General features of cooperative programmes can be found in the Dalhousie University Calendar under the heading "Co-operative Education in Science". Students are urged to read and become familiar with this material.

F. Advanced Major Co-op Programme

Eligibility

Students may be admitted to the programme when they have successfully completed all the classes listed below under Year 1, with an average GPA of at least 2.70, normally with no grade of less than a C. This minimum standing must be maintained throughout the degree programme. Students must register before August 1, but should, however, register their intention to enter the programme with the Chemistry Office in the Spring of their first year.

Departmental Requirements

Year 1

Regular Session

- CHEM 1011.03/1012.03 (or equivalent)
- MATH 1000.03
- MATH 1010.03
- PHYC 1100.06 (or PHYC 1300.06)
- BIOL 1000.06
- Writing class (suggested are ENGL 1000.06 or GERM 1050.06)

Spring or Summer Session

- CHEM 2401.03/2402.03

Year 2

Fall Session A

- CHEM 2101.03
- CHEM 2201.03
- CHEM 3402.03
- SCIE 8700.00
- STAT 1060.03 or 2060.03
- COMP 1000.03.

These classes must be successfully completed before proceeding to Work Term 1.

Winter Session B

- CHEM 8891.00 (Work Term 1)

Summer

- COMP 1400.03, COMP 1410.03, plus 2 half-credit electives

Remainder of the programme

Various options are possible, which must include:

- CHEM 2301.03
- CHEM 2302.03
- CHEM 3101.03
- CHEM 3102.03
- CHEM 3201.03
- CHEM 3202.03
- CHEM 3303.03
- CHEM 3401.03
- One half-credit Chemistry class at the 3000 or 4000 level
- One of CHEM 42xx.03, 4501.03*, 4502.03*
- CHEM 8892.00
- CHEM 8893.00
- CHEM 8894.00
- STAT 2080.03
- Six half-credit electives.

Students may wish to consult the Coordinator of the DalChem Co-op Chemistry Programme for advice on scheduling options.

G. Major in Chemistry

Departmental Requirements

1000 level

- CHEM 1011.03/1012.03 (or equivalent)

2000 level

- CHEM 2101.03
- CHEM 2201.03
- CHEM 2301.03
- CHEM 2302.03
- CHEM 2401.03/2402.03

3000 level

- At least one credit at or above the 3000 level

All Chemistry classes must be passed with a grade of at least C-.

Other required classes

- PHYC 1100.06 or 1300.06
- MATH 1000.03
- MATH 1010.03

H. Earth System Science

Refer to the Earth System Science section in this calendar.

III. Classes Offered

PLEASE NOTE: Classes marked * may not be offered every year.

The credit hour extension following the class number, e.g. .06 or .03 indicates the credit hour weight of the class. Consult the timetable for up-to-date details.

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 2000 level 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 1000.06: 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 1000.06 is an approved "writing class" in the College of Arts and Science. CHEM 1000.06 does not serve as a prerequisite for second-year chemistry classes. INSTRUCTOR: T.S. Cameron

FORMAT: \approx Writing Requirement, lecture 2 hours, lab/tutorial 2 hours

EXCLUSION: CHEM 1000.06 cannot be taken concurrently with or after CHEM 1010.06, 1020.06, 1040.06 and 1500.06

CHEM 1011.03: General Chemistry Part I.

A study of the fundamental principles of chemistry with particular reference to stoichiometry, atomic structure and the Periodic table, and molecular structure, bonding and geometry. CHEM 1012.03 is a sequel to this class.

FORMAT: Lecture 3 hours, tutorial 1 hour, lab 2 hours

CHEM 1012.03: General Chemistry Part II.

This class builds on the principles from CHEM 1011.03 to provide a broader background. Material covered includes: kinetics, chemical equilibrium, pH, acids, bases, buffers, and solubility. The class gives an introduction to thermodynamics and chemical equilibrium, electrochemistry, and organic chemistry. CHEM 1011.03 combined with CHEM 1012.03 covers the materials previously given in CHEM 1010.06. CHEM 1011.03 and CHEM 1012.03 together may serve as prerequisite for any 2000 level class in chemistry.

FORMAT: Lecture 3 hours, tutorial 1 hour, lab 2 hours

PREREQUISITE: CHEM 1011.03, or permission of the instructor

CHEM 1021.03: Engineering Chemistry I.

A study of the fundamental principles of chemistry with an emphasis on quantitative topics, including chemical equilibrium, thermodynamics, reaction kinetics and electrochemistry. This class is only open to students in the Engineering programme.

INSTRUCTOR: J.A. Coxon

FORMAT: Lecture 3 hours, tutorial 1 hour, lab 2 hours

PREREQUISITE: Nova Scotia Grade 12 chemistry or equivalent.

CHEM 1022.03: Engineering Chemistry II.

This class builds on the principles of Chemistry 1021.03 to provide a broader background in chemistry for Engineering students.

Chemistry 1021.03 combined with Chemistry 1022.03 covers the material previously given in Chemistry 1020.06R. Chemistry 1021.03 and 1022.03 together may serve as a prerequisite for any 2000-level class in chemistry.

INSTRUCTOR: J.A. Coxon

FORMAT: Lecture 3 hours, tutorial 1 hour, lab 2 hours

PREREQUISITE: Chemistry 1021.03 or permission of the instructor

CHEM 1041.03: General Chemistry for the Life and Health Sciences Part I: Chemical Form and Function.

This class will build up the concepts of the microscopic world of chemistry, starting from such fundamentals as light (electromagnetic energy), continuing with electrons as wave around a nucleus, progressing to atoms as partners in bonding, arriving at the shapes and interactions of molecules in space, and concluding with multimolecular arrangements (such as cell membranes). While this class and its sequel CHEM 1042.03 will cover the same chemical principles as CHEM 1011.03/1012.03, and will do so at a similar level, its context and examples will relate to the molecules of life, i.e., primarily to organic biochemical aspects of chemistry.

FORMAT: Lecture 3 hours; tutorial 1 hour, lab 2 hours

CHEM 1042.03: General Chemistry for the Life and Health Sciences Part II: Chemical Reactivity.

Atoms and molecules enter many reactions. These reactions can be described — and sometimes even understood — according to various macroscopic chemical principles. Thus, kinetics will consider the speed of reactions and thermodynamics their direction and energy; acid/base equilibria will characterize the exchange of protons and electrochemical potentials the exchange of electrons; nuclear chemistry will explore the high-energy world of radioisotopes. Throughout, and as in CHEM 1041.03, the context in which these chemical principles will be shown to operate is that of the living organism in interaction with its environment.

FORMAT: Lecture 3 hours, tutorial 1 hour, lab 2 hours.

PREREQUISITE: CHEM 1041.03 or permission of instructor

CHEM 1410.03: Introductory Chemistry.

A descriptive introduction to chemistry with emphasis on materials related to 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: D.L. Hooper, P.D. Pacey

FORMAT: Lecture 3 hours, tutorial 2 hours

NOTE: This class does not serve as a prerequisite for any other chemistry class.

CHEM 1430.06: Introductory Chemistry and Biochemistry.

This class combines CHEM 1410.03 and Biochemistry 1420.03B for use by Nursing students.

NOTE: This class does not serve as a prerequisite for any other classes in chemistry or biochemistry.

CHEM 2101.03: 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, K.R. Grundy

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITE: CHEM 1011.03/1012.03 or equivalent

CHEM 2201.03: 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.

INSTRUCTOR: R. Stephens, P.D. Wentzell

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITE: CHEM 1011.03/1012.03 or equivalent

CHEM 2301.03: 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: P.G. Kusalik

FORMAT: Lecture 3 hours, lab/tutorial 3 hours

PREREQUISITE: CHEM 1011.03/1012.03 or equivalent; MATH 1000.03 and 1010.03

EXCLUSION: Students registered in/or having received credit for CHEM 2303.03 are not permitted to register in CHEM 2301.03

CHEM 2302.03: 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: P.D. Pacey

FORMAT: Lecture 3 hours, lab/tutorial 3 hours

PREREQUISITES: CHEM 1011.03/1012.03 or equivalent; MATH 1000.03

EXCLUSION: Students registered in/or having received credit for CHEM 2303.03 are not permitted to register in CHEM 2302.03

***CHEM 2303.03: Physical Chemistry for the Life Sciences.**

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 reactions and chemical equilibrium are treated by application to examples of biological and environmental interest. Chemistry majors may not apply credit for CHEM 2303.03 towards the major requirements for a degree in Chemistry.

INSTRUCTOR: D.L. Hooper

FORMAT: Lecture 3 hours, lab/tutorial 3 hours

PREREQUISITE: CHEM 1011.03/1012.03 or equivalent

EXCLUSION: Students registered in/or having received credit for CHEM 2303.03 are not permitted to register in CHEM 2301.03 and/or 2302.03.

CHEM 2401.03: Introductory Organic Chemistry: Structure, Concepts of Mechanisms and Spectroscopy.

This class provides an introduction to the structure of carbon-containing compounds and to the mechanistic principles of their reactivity. Topics include bonding, acid-base properties, stereochemistry and spectroscopy (IR, UV, MS, ^1H and ^{13}C NMR) of organic molecules. In addition, the principles of reactivity and mechanisms will be introduced through the chemistry of alkylhalides. Laboratory work will include introductory techniques of organic chemistry and will complement the topics listed above.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: CHEM 2400.06

PREREQUISITE: CHEM 1011.03/1012.03 or equivalent

CHEM 2402.03: Introductory Organic Chemistry: Reactivity of Functional Groups.

This class is a continuation of CHEM 2401.03 and will cover fundamental mechanisms and synthesis involving the common organic functional groups. Laboratory work will amplify these topics.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: CHEM 2400.06

PREREQUISITE: CHEM 2401.03

CHEM 2441.03: Foundations of Organic and Biological Chemistry.

This class is intended primarily to help students in the life sciences develop an appreciation for the chemistry of molecules which are important to living organisms.

Emphasis is placed on structure, functional groups and stereochemistry; reactions are not emphasized, although some that are profoundly important in biological systems will be discussed.

The class will develop enough chemistry to help students gain appreciation for the properties of carbohydrates, amino acids, lipids and nucleic acids. Laboratory work emphasizes naturally occurring molecules and includes experiments dealing with the separation, characterization and identification of examples of these organic compounds.

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITE: CHEM 1011.03/1012.03 or equivalent, or permission of the instructor

EXCLUSIONS: CHEM 2441.03 does not serve as a prerequisite for any other chemistry class, nor will it count as a Chemistry credit towards any degree with a major in Chemistry.

CHEM 2442.03: Organic Chemistry for Pharmacy Students.

This class will cover aspects of organic chemistry relevant to the requirements for the degree of Bachelor of Science in Pharmacy. This class does not serve as a prerequisite for any other chemistry class.

FORMAT: At the convenience of the College of Pharmacy

RESTRICTION: Restricted to students in the Bachelor of Science in Pharmacy programme.

CHEM 2505.03: Environmental Chemistry I.

The objective of this class is to apply the knowledge acquired in introductory chemistry classes to the description of chemical reactions in the environment. The class will start with the composition of the atmosphere, photochemical reactions in the stratosphere (ozone production and loss) and troposphere (production of smog) and simple models used to describe room air quality. The class will then describe the transfer of gases across the air/water interface and the chemistry of natural waters (hardness, alkalinity), the treatment of both drinking water (chlorination and aeration/coagulation) and waste waters (primary, secondary and tertiary treatment). The class will also introduce the students to some of the classes of chemicals commonly encountered in the environment and describe their impact both on humans and aquatic organisms. The chemicals to be discussed include formaldehyde, chlorinated hydrocarbons, pesticides, PAHs, and heavy metals.

INSTRUCTOR: R.D. Guy

FORMAT: Lecture 3 hours

PREREQUISITE: CHEM 1011.03/1012.03 or equivalent

EXCLUSIONS: Students having received credit for Chemistry 4203.03 are not permitted to register in CHEM 2505.03

CHEM 3101.03: 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 2101.03

CHEM 3102.03: 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: T.S. Cameron
FORMAT: Lecture 2 hours, tutorial 1 hour, lab 3 hours
PREREQUISITE: CHEM 2101.03

CHEM 3201.03: 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 4 hours
PREREQUISITE: CHEM 2201.03

CHEM 3202.03: 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, 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: L. Ramaley
FORMAT: Lecture 3 hours, lab 4 hours
PREREQUISITE: CHEM 3201.03 or instructor's consent

CHEM 3301.03: 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: Lecture 3 hours
PREREQUISITE: Mathematics 2000.06 or 2480.03/2490.03B and CHEM 2101.03 or 2301.03 or 2302.03

CHEM 3302.03: 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 3301.03 or permission of the instructor

CHEM 3303.03: 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 2301.03 or PHYC 3200.03 or EARTH 2100.06 or ENGI 2340.03 or permission of the instructor.

CHEM 3401.03: Intermediate Organic Chemistry.

This class is a continuation of CHEM 2400.06 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, there is a continuing emphasis on 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 2401.03/2402.03, as evidenced by a grade of at least C, and should possess adequate laboratory skills, such as can be obtained from CHEM 3101.03, 3102.03 or 3402.03.

INSTRUCTOR: J.S. Grossert
FORMAT: Lecture 3 hours, lab 3 hours
PREREQUISITE: CHEM 2401.03/2402.03 (or equivalent) with a grade of at least C.

CHEM 3402.03: Identification of Organic Compounds.

The class develops separation techniques, together with wet chemical and spectroscopic analysis methods, that were introduced in CHEM 2401.03/2402.03. 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 2401.03/2402.03, as evidenced by a grade of at least C.

INSTRUCTOR: T.P. Forrest
FORMAT: Lecture 3 hours, lab 3 hours
PREREQUISITE: CHEM 2401.03/2402.03 (or equivalent)

CHEM 3403.03: 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 2401.03/2402.03 or equivalent

CHEM 3880.00: General Topics In Chemistry.

A non-credit seminar class to be given by invited speakers. Attendance at all seminars is required of all third-year Honours Chemistry students.

***CHEM 4101.03: 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: Lecture 3 hours

PREREQUISITE: CHEM 3101.03

CROSS-LISTING: CHEM 5101.03

***CHEM 4102.03: 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.

INSTRUCTOR: K.R. Grundy

FORMAT: Lecture 3 hours

PREREQUISITE: CHEM 3102.03 or instructor's consent

CROSS-LISTING: CHEM 5102.03

***CHEM 4201.03: 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 3201.03, or instructor's consent

CROSS-LISTING: CHEM 5201.03

***CHEM 4202.03: 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

PREREQUISITE: CHEM 3201.03

CROSS-LISTING: CHEM 5202.03

***CHEM 4203.03: 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

PREREQUISITE: CHEM 3201.03 or CHEM 2505.03

CROSS-LISTING: CHEM 6203.03

CHEM 4204.03: Nuclear Analytical Chemistry.

This class introduces basic concepts of nuclear chemistry and nuclear analytical methods. The class includes: discovery of radioactivity; nuclides and natural decay chain; types of radioactive decay; nuclear reactions; research reactors; instrumental, preconcentration and radiochemical neutron activation analysis; and two laboratory sessions on NAA.

INSTRUCTOR: A. Chatt

PREREQUISITE: CHEM 3201.03

CROSS-LISTING: CHEM 6204.03

CHEM 4301.03: 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. Computer based assignments are included.

INSTRUCTOR: R.J. Boyd

FORMAT: Lecture 3 hours

PREREQUISITE: CHEM 3301.03 or instructor's consent

CROSS-LISTING: CHEM 5301.03

***CHEM 4304.03: 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.

INSTRUCTOR: P.D. Pacey

FORMAT: Lecture 2 hours

PREREQUISITE: CHEM 2302.03 or equivalent

CROSS-LISTING: CHEM 5304.03

***CHEM 4305.03: 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 emphasised. An overview of modern techniques is also given.

INSTRUCTOR: P.G. Kusalik

FORMAT: Lecture 3 hours

PREREQUISITE: CHEM 3303.03 and MATH 2001.03, or instructor's consent

CROSS-LISTING: CHEM 5305.03

***CHEM 4306.03: 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, esr of organic radicals, relaxation, molecular rate processes, and two dimensional nmr. Students will be assigned problems on a regular basis.

INSTRUCTOR: R.E. Wasylshen

FORMAT: Lecture 3 hours

PREREQUISITE: CHEM 3301.03 or instructor's consent

CROSS-LISTING: CHEM 5306.03

CHEM 4401.03: 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, R.L. White

FORMAT: Lecture 3 hours

PREREQUISITE: CHEM 3401.03 and 3402.03 or equivalents, or instructor's consent

CROSS-LISTING: CHEM 5401.03

CHEM 4402.03: Organic Structure Determination.

This class continues the study of molecular structure and conformation begun in CHEM 3402.03, using methods and results from infrared and nuclear magnetic resonance. Topics include the correlation of structure and conformation with chemical shifts and coupling constants, analysis of nmr spectra, the theory and application of multiple irradiation experiments, and the vector model of 1D and 2D experiments. Infrared spectroscopy and mass spectrometry are introduced to emphasize the importance of the use of combined spectroscopic methods in solving structural problems.

INSTRUCTOR: D.L. Hooper

FORMAT: Lecture 3 hours, lab 3 hours alternate weeks

PREREQUISITE: CHEM 3402.03

CROSS-LISTING: CHEM 5402.03

CHEM 4403.03: Organic Reaction Mechanisms.

The fundamental concepts of bonding, structure, and dynamic behaviour of organic compounds are discussed. Methods for determining the mechanisms of organic reactions are discussed. Topics considered may include molecular orbital theory and molecular mechanics calculations, 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.

INSTRUCTOR: D.R. Arnold, J.A. Pincock

FORMAT: Lecture 3 hours

PREREQUISITE: CHEM 3401.03 and 3402.03 or equivalents, or instructor's consent

CROSS-LISTING: CHEM 5403.03

***CHEM 4501.03: 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 2201.03

CROSS-LISTING: CHEM 6501.03

***CHEM 4502.03: Polymer Science.**

This class will cover aspects of synthesis, analysis, characterization, structure and uses 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

FORMAT: Lecture 3 hours

PREREQUISITE: CHEM 2201.03 and 2301.03 and 2302.03 and 2400.06 or instructors' consent

***CHEM 4503.03: 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 3302.03

CROSS-LISTING: CHEM 5503.03

***CHEM 4504.03: 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 2101.03 and MATH 2000.06 or 2200.06 or equivalent

CHEM 4801.03: Research Project in Chemistry I.

This class is designed for those students who wish to participate in scientific research. It will consist of a literature, experimental, or theoretical research project carried out under the supervision of a faculty member on some aspect of chemistry in which the student has an interest and the appropriate background. The results of the research will be submitted to the Department as a report that will be graded. Students must meet with the Coordinator of Honours and Advanced Major projects before undertaking their project. Students interested in taking this class during the spring or summer sessions should consult the Coordinator. The consent and signature of the Coordinator are required.

PREREQUISITES: CHEM 2101.03, 2201.03, 2301.03, 2302.03 and 2400.03, plus at least one full credit at the 3000 or 4000 level in the area of interest with an average grade of at least B-, or consent of the Coordinator.

EXCLUSION: CHEM 4803.06

CHEM 4802.03: Research Project in Chemistry II.

This class is intended for those students in the Advanced Major programme with an appropriate background who wish greater exposure to independent scientific research. It will consist of a research project carried out under the supervision of a faculty member containing some original component on any aspect of chemistry. The results of the research will be submitted to the Department as a report that will be graded. The student must also make an oral presentation of this work to the Department. Students wishing to enter this class must have already demonstrated their research abilities by successfully completing CHEM 4801.03.

Students must meet with the Coordinator of Honours and Advanced Major projects before undertaking their project. Students interested in taking this class during the spring or summer sessions should consult the Coordinator. The consent and signature of the Coordinator are required.

PREREQUISITES: CHEM 4801.03, plus an additional 3.5 credits total in chemistry at the 3000 or 4000 level with an average of at least B-, or consent of the Coordinator.

EXCLUSION: CHEM 4803.06

CHEM 4803.06: Advanced Research Project.

This class is intended for those students in the Advanced Major programme who wish exposure to independent scientific research. It will consist of a research project carried out under the supervision of a faculty member containing some original component on any aspect of chemistry. The results of the research will be submitted to the Department as a report that will be graded. The student must also make an oral presentation of this work to the Department. Students wishing to enter this class must have an appropriate background in Chemistry and must meet with the Coordinator of Honours and Advanced Major projects before undertaking their project. Any students interested in taking this

class during the spring or summer sessions should consult the Coordinator. The consent and signature of the Coordinator are required.

PREREQUISITE: At least four full credits in chemistry at the 3000 or 4000 level with an average grade of B-, or consent of the Coordinator.

EXCLUSIONS: CHEM 4801.03, 4802.03

CHEM 4880.00: Advanced Topics in Chemistry.

A non-credit seminar class to be given by invited speakers. Attendance at all seminars is required of all fourth-year Honours Chemistry students.

CHEM 4901.06: Honours Research Project.

This class is required for those students in the honours programme. It will consist of a research project carried out under the supervision of a faculty member and will contain some original component on any aspect of chemistry. The results of the research will be submitted to the Department as a report that will be graded. The student must also make oral presentations of this work to the Department. Students wishing to enter this class must have an appropriate background in Chemistry and must meet with the Coordinator of Honours projects before undertaking their project. Any students interested in taking this class during the spring or summer sessions should consult the Coordinator. The consent and signature of the Coordinator are required.

INSTRUCTOR: T.S. Cameron

PREREQUISITES: At least four full credits in chemistry at the 2000, 3000, or 4000 level from those credits required for the honours programme, with an average grade of at least 3.0, or consent of the Coordinator.

CHEM 8880.00: Honours Qualifying Examination.

This is an additional class required of all honours students in Chemistry in order to obtain their twenty first credit. It should be taken together with CHEM 4901.06 in the final year of a concentrated chemistry or combined 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

CHEM 8891.00: Co-op workterm 1.

CHEM 8892.00: Co-op workterm 2.

CHEM 8893.00: Co-op workterm 3.

CHEM 8894.00: Co-op workterm 4.

SCIE 3000.06: Science Fundamentals.

See class description in Science, Interdisciplinary section of this calendar.

SCIE 8700.00: Co-op Seminar.

The class provides an introduction to business practices, information retrieval and laboratory safety.

Classics

Location: 1244 LeMarchant Street
Halifax, NS B3H 3J5
Telephone: (902) 494-3468
Fax: (902) 494-2467

Dean
Taylor, G.D., BA, PhD (Penn)

Chair
Atherton, J.P. (494-3468)

Undergraduate Advisor
Calkin, P.J. (494-2279)

Professors Emeriti
Crouse, R.D., BA (Vind), STB (Harv), MTh (Trin), PhD (Harv), DD (Trin)
Doull, J.A., BA (Dal), MA (Tor)

Professors
Atherton, J.P., MA (Oxon.), PhD (Liverpool)
Friedrich, R., Dr.phil. (Goettingen)
Hankey, W.J., BA (Vind), MA (Tor), DPhil (Oxon)
Starnes, C.J., BA (Bishop's), STB (Harv), MA (McG), PhD (Dal),
President of University of King's College

Associate Professors
House, D.K., MA (Dal), PhD (Liverpool)
Kusmaul, P.F., Dr.phil (Basle), Dr.phil.habil. (Heidelberg)

Assistant Professor
Calkin, P.J., BA (UBC), MA, PhD (Dal)

I. 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 students who discover an interest in classics to begin their 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 its 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 Archaeology.

II. Degree Programmes

See "Degree Requirements" section for complete details.

A. Honours in Classics

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.

Departmental Requirements

Classes required in Honours

2000 level

- Six to eight credits at or above the 2000 level in Classics

3000 level

- At least three credits at 3000 level or higher in Classics must include work in Greek or Latin at the 3000 level in one and at the 2000 level in the other

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.

B. 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.

C. Advanced Major in Classics (20 credit)

Departmental Requirements

2000 level: Three to six credits at or above the 2000 level in Classics

3000 level: At least three credits at or above the 3000 level in Classics

Other requirements

Usually two language classes in Greek and/or Latin are required.

D. Major in Classics, BA (15 credit)

Classes required in major

2000 level: Two to six credits at or above the 2000 level

3000 level: At least two credits at or above the 3000 level

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 1000.06; CLAS 1010.06; CLAS 1100.06.

The programmes of all students majoring or honouring in the Department must be approved by the Undergraduate Advisor.

iii. Classes Offered

NOTE: Classes marked * are not offered every year. Please consult the current timetable or the Classics Department (494-3468) to determine this year's offerings.

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 1000.06: Classical Literature.

An introduction to classical literature, read in English translations. Authors studied are Homer, the Greek Tragedians, Plato, Vergil and St. Augustine. This class meets the first year writing requirement.

INSTRUCTOR: W. Hankey

FORMAT: ✍ Writing Requirement, Lecture 2 hours

CLAS 1010.06: 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 (Mesopotamian, Egyptian, Hebrew, 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 and Rome are studied, as well as their issue in the Early Christian world. 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: ✍ Writing Requirement, Lecture 2 hours

*CLAS 1021.03: 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: Staff

FORMAT: Lecture 3 hours, (given at St. Mary's University)

*CLAS 1022.03: 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: Staff

FORMAT: Lecture 3 hours

CLAS 1100.06: 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 class 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 class 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 fulfills the first year writing requirement.

INSTRUCTOR: Staff

FORMAT: ✍ Writing Requirement, Lecture 2 hours

CLAS 1700.06: 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

CLAS 1800.06: 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: Staff

FORMAT: Lecture 3 hours

CLAS 2000.06: Classical Literature.

An introduction to classical literature, read in English translations. Authors studied are Homer, the Greek Tragedians, Plato, Vergil and St. Augustine. This class is the same as CLAS 1000.06 and may therefore not be taken by anyone who has taken that class.

INSTRUCTOR: W. Hankey

FORMAT: Lecture 3 hours

CLAS 2100.06: 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 class 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 class 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 1100.06 and may therefore not be taken by anyone who has taken that class.

INSTRUCTOR: Staff

FORMAT: Lecture 2 hours

*CLAS 2200.06: 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 CLAS 2210.06.

INSTRUCTOR: Staff

FORMAT: Lecture 2 hours

***CLAS 2210.06: 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 CLAS 2200.06 and, like it, is open to first-year students. There is no foreign language requirement.

INSTRUCTOR: Staff

FORMAT: Lecture 2 hours

CLAS 2361.03/CLAS 2362.03: 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.

INSTRUCTOR: J. P. Atherton/W. J. Hankey

FORMAT: Lecture 2 hours

CROSS-LISTING: PHIL 2361.03/2362.03

EXCLUSION: CLAS 3361.03/3362.03

***CLAS 2501.03: 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

CLAS 2700.06: Intermediate Greek.

A continuation of CLAS 1700.06 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, Lysias 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 1700.06. 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 1700.06 or 2710.06

CLAS 2710.06: Greek Prose.

A study of Greek grammar through the reading of Greek prose authors (Xenophon, Lysias).

INSTRUCTOR: Staff

PREREQUISITE: Any 1000 level Classics class or equivalent.

FORMAT: Seminar 3 hours

PREREQUISITE: Any 1000 level Classics class or equivalent

CLAS 2800.06 A: Study of Latin Prose and Poetry.

CLAS 2800.06 is a continuation of CLAS 1800.06 or CLAS 2810.06. 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: Staff

FORMAT: Seminar 2 hours

PREREQUISITE: CLAS 1800.06 or 2810.06

CLAS 2810.06: Latin Prose.

A study of Latin accidence and syntax through the reading of Roman prose authors (Caesar, Cicero).

INSTRUCTOR: Staff

FORMAT: Seminar 3 hours

PREREQUISITE: Any 1000 level Classics class or equivalent

***CLAS 2860.06: Latin Historical Texts.**

INSTRUCTOR: J.P. Atherton

FORMAT: Seminar 2 hours

PREREQUISITE: 1800.06 or 2810.06

***CLAS 3280.06: Christian Beginnings and the Early History of the Church.**

FORMAT: Seminar 2 hours

CROSS-LISTING: CLAS 5708.03

***CLAS 3300.06: 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

***CLAS 3370.06: 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

CROSS-LISTING: CLAS 5370.06

CLAS 3380.06: Medieval Philosophy.

A study of texts written in the Middle Ages of Latin Europe selected to illustrate the development of philosophy in the period. Three texts will normally be read in their entirety: Boethius, *The Consolation of Philosophy*, Anselm, *Proslogion*, Bonaventure, *Itinerarium Mentis in Deum*. Selections from other works will normally include Augustine, *De Quantitate Animae*, Eriugena, *Periphyseon*, Aquinas, *Summa Theologiae*, Nicholas of Cusa, *De docta ignorantia*. Texts of Ockham and John Duns Scotus will also be read.

Themes emphasized will include: the relation of Neoplatonic and classical philosophic logics, the development and character of system, the relation of being to non-being and of ideal to sensible, the balance of Plotinian - Augustinian and Procline - Dionysian logics, the relation of logical, ontic and psychological structures. Participants will be required to make class presentations.

INSTRUCTOR: W.J. Hankey

FORMAT: Lecture/seminar, 2 hours

CROSS-LISTING: PHIL 2380.06

***CLAS 3400.06: 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

CROSS-LISTING: CLAS 5603.06

***CLAS 3410.06: 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 3420.06.

INSTRUCTOR: C.J. Starnes
FORMAT: Seminar 2 hours
CROSS-LISTING: CLAS 5705.06

***CLAS 3420.06: 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 3410.06.

INSTRUCTOR: C.J. Starnes
FORMAT: Seminar 2 hours
CROSS-LISTING: CLAS 5706.06

CLASS 3430.06: St. Augustine's On the Trinity.

A study of the 15 books of Augustine's *De Trinitate*. The first term will concentrate on Books 1-7 in which he establishes what is the orthodox teaching about God through Scripture and a consideration of the categories of substance, relation and act. The second term examines Books 8-15 in which he attempts to understand what has been shown in the first 7 books through the distinction of *scientia* and *sapientia*. The class presupposes some knowledge of the history of ancient philosophy (especially Aristotle & Neo-Platonism) and some of Latin.

INSTRUCTOR: C.J. Starnes
FORMAT: Seminar, 2 hours
PREREQUISITE: Knowledge of the history of Ancient Philosophy and Latin
CROSS-LISTING: CLAS 5707.06

CLAS 3470.06: Reading and Research.

Ancient Literature

CLAS 3480.06: Reading and Research.

Ancient History

CLAS 3490.06: Reading and Research.

Ancient Philosophy

***CLAS 3500.06: 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: CLAS 2361.03/2362.03
CROSS-LISTING: CLAS 5602.06

CLAS 3510.06: Greek and Roman Drama: From Aeschylus to Seneca.

This class offers a comprehensive study of Greek and Roman Drama, both Tragedy and Comedy. Authors studied are the Greek tragedians Aeschylus, Sophocles, Euripides, and the Greek comic poets Aristophanes and Menander; and on the Roman side, Plautus and Terence, the authors of comedies, and Seneca, the author of tragedies that exerted a strong influence on Elizabethan drama and more recently on the Theatre of Cruelty of Artaud. The study of the plays will be accompanied by the study of two theoretical texts: Aristotle's *Poetics*, which provides the theory of Greek drama; and Horace's *Art of Poetry* - two treatises whose influence on Western esthetic and literary theory can hardly be overestimated.

INSTRUCTOR: R. Friedrich
FORMAT: Seminar 2 hours

CLAS 3700.06: Advanced Greek.

This class, which reads both a prose and a poetic work, is the normal third class in Greek.

INSTRUCTOR: D.K. House/R. Friedrich
FORMAT: Seminar 2 hours
PREREQUISITE: CLAS 2700.06

***CLAS 3710.06: Greek Epic.**

INSTRUCTOR: R. Friedrich
FORMAT: Seminar 2 hours
PREREQUISITE: CLAS 3700.06
CROSS-LISTING: CLAS 5010.06

***CLAS 3720.06: Greek Lyric.**

INSTRUCTOR: Staff
FORMAT: Seminar 2 hours
PREREQUISITE: CLAS 3700.06
CROSS-LISTING: CLAS 5013.06

***CLAS 3730.06: Greek Drama: Tragedy.**

INSTRUCTOR: R. Friedrich
FORMAT: Seminar 2 hours
PREREQUISITE: CLAS 3700.06
CROSS-LISTING: CLAS 5011.06

***CLAS 3750.06: Greek Authors.**

FORMAT: Seminar 2 hours
PREREQUISITE: CLAS 3700.06
CROSS-LISTING: PHIL 3750.06

CLAS 3760.06: Reading and Research of Greek Texts.

FORMAT: Seminar 2 hours
PREREQUISITE: CLAS 3700.06

***CLAS 3780.06: Greek Historians.**

FORMAT: Seminar 2 hours
PREREQUISITE: CLAS 3700.06
CROSS-LISTING: CLAS 5032.06

CLAS 3791.03: Reading and Research

FORMAT: Seminar 2 hours
PREREQUISITE: CLAS 3700.06

***CLAS 3800.06: Roman Satire.**

INSTRUCTOR: Staff
FORMAT: Seminar 2 hours

CLAS 3810.06: 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.

INSTRUCTOR: J.P. Atherton/R. Friedrich
FORMAT: Seminar 2 hours
PREREQUISITE: A class in Latin at the 2000 level
CROSS-LISTING: CLAS 5040.06

CLAS 3820.06: Advanced Reading in Latin Literature.

FORMAT: Seminar 2 hours
PREREQUISITE: CLAS 2800.06

***CLAS 3840.06: Latin Philosophical Texts.**

The purpose is to give students experience in reading philosophical Latin. The texts are normally chosen from medieval authors like Anselm and Bonaventure.

INSTRUCTOR: W.J. Hankey

FORMAT: Seminar 2 hours

PREREQUISITE: First-year Latin or its equivalent

CROSS-LISTING: CLAS 5840.06

CLAS 3850.06: Reading and Research of Latin Texts.

FORMAT: Seminar 2 hours

PREREQUISITE: CLAS 2800.06

***CLAS 3900.06: 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 3910.06.

INSTRUCTOR: J.P. Atherton

FORMAT: Seminar 2 hours

CROSS-LISTING: CLAS 5604.06

***CLAS 3910.06: 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 3900.06.

INSTRUCTOR: J.P. Atherton

FORMAT: Seminar 2 hours

RECOMMENDED: CLAS 2361.03/2362.03

CROSS-LISTING: CLAS 5605.06

***CLAS 4200.06: Ancient Practical Philosophy.**

FORMAT: Seminar 2 hours

***CLAS 4320.06: Ancient and Modern Dialectic.**

FORMAT: Seminar 2 hours

***CLAS 4400.06: 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.

INSTRUCTOR: W.J. Hankey

FORMAT: Seminar 2 hours

CROSS-LISTING: CLAS 5700.06

***CLAS 4450.06: Medieval Interpreters of Aristotle.**

The class considers Latin philosophical texts of the Middle Ages. Given alternately with CLAS 4500.06.

INSTRUCTOR: W.J. Hankey

FORMAT: Seminar 2 hours

CROSS-LISTING: CLAS 5701.06

***CLAS 4500.06: Seminar on Neoplatonism.**

The class considers the origin and nature of Greek Neoplatonism. Given alternatively with CLAS 4450.06.

INSTRUCTOR: W.J. Hankey

FORMAT: Seminar 2 hours

CLAS 4530.06: 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: Staff

FORMAT: Seminar 2 hours

CROSS-LISTING: CLAS 5530.06

CLAS 4580.06: Reading and Research

CLAS 4680.03/4690.03: Reading and Research

CLAS 4710.03/4720.03: Special Topics

CLAS 4800.06: Reading and Research

CLAS 4810.03/4820.03: Special Topics

CLAS 4850.06: Reading and Research

CLAS 4900.06: Departmental Seminar:

FORMAT: Seminar 2 hours

CLAS 4910.06: Departmental Seminar.

FORMAT: Seminar 2 hours

CLAS 0400.00: 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 2810.06 and CLAS 2710.06

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.

Commerce

School of Business Administration

Location: 6152 Coburg Road
Halifax, NS B9H 1Z5
Telephone: (902) 494-7080
Fax: (902) 494-1107

Dean

Rosson, P., Dip MS (Salford), MA (Lancaster), PhD (Bath)

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 commerce programme includes studies in the humanities and social sciences as well as in the functional areas of business. It is offered on a co-operative education (work/study) basis.

In co-operation with the Faculty of Arts and Social Sciences, the School also offers a Bachelor of Arts, Advanced Major or Honours, with a Minor in Business.

Administrative Staff 1998-99

Director, School of Business Administration
Klapstein, R.E.

Commerce Programme Co-ordinator
MacInnis, A.J.

Director, Centre for International Business Studies
Brooks, M.R.

Director, International Student Exchange Programme
Shafai, Y.

Director, Co-op Programme
Walsh, E.

Co-op Office Professional Staff
MacDonald, John
MacLeod, J.
Royle, D.

Employer & Alumni Relations Co-ordinator
Young, A.

Academic Staff 1998-99

Professors Emeriti

Brookbank, C.R., BA, MA, PhD (Tor)
George, R.E., BSc (Lond), MA (Bristol), PhD (Lond)
Parker, J.R.E., BCom (Dal), MBA (Wash), CPhil (Mich), FCA

Professors

Brooks, M.R., BOT (McG), MBA (Dal), PhD (Wales)
Conrod, J.E.D., BCom (Dal), MBA (Tor), CA
Fooladi, I., BS (Iran), MA (Tehran), MS, PhD (Oregon)
MacLean, L.C., BA, BEd (StFX), MA, PhD (Dal)
McNiven, J.D., BA, MA, PhD (Mich)
Mealiea, L.W., BA, MBA (Rutgers), PhD (Mass)

Rosson, P.J. (Dean, Faculty of Management), Dip MS (Salford), MA (Lancaster), PhD (Bath)
Sankar, Y., BA (McG), MA (Tor), PhD (Johns Hopkins)
Schellinck, D.A., BSc, MBA (Dal), PhD (Ill)

Associate Professors

Archibald, B.C., BA (Queen's), MSc (Stanford), PhD (Waterloo)
Blunden, R.G., BCom (Dal), MM (Northwestern), PhD (Western)
Carroll, R., BBA, BEd (StFX), MBA (Dal), PhD (Dal), FCGA
Cherry, D.C., BCom (Dal), MBA (McM), CMA
Dirksen, C.J., MBA (Oregon), BS (Santa Clara), PhD (Oregon)
Duffy, J.F., BS, MS, PhD (Iowa State)
Ellison, R.A., BSc (UNB), MBA (McM), PhD (Tenn)
Gassmann, H.L., Vordiplom (Stuttgart), MS (Oregon State), PhD (UBC)
Ireland, A.M., BA (Chatham), MSc (Car-Mel), MBA, PhD (Dal), CA
Klapstein, R.E., (Director), BSc (Calg), BA (Alta), MBA, LLB (Dal), LLM (Osgoode Hall), CMA
Larsson, S.O., BSc (SGW), MSc (Alta), PhD (UBC)
Maddox, R.N., BA, MBA, PhD (Ohio State)
Oppong, A., BSc (Ghana), MBA (Chicago), PhD (Iowa), CGA
Patton, D.J., BA (UNB), MA (Tor), DBA (Indiana)
Peacock, A.C., BA, MA, PhD (Western)
Rumsey, J., BA (USC, Berkley), MSc (Vic), BED (Tor), MBA, PhD (York)
Sagebien, J., BA (Hampshire Coll), MA (Naropa Inst), MBA (Simmon's Coll), PhD (London School of Economics)
Scott, E.W., BCom (Dal), MBA (Col), CA, CMA
Shafai, Y., BSc, MPA (Tehran), MBA, PhD (Mich State)
Street, R.A., BCom, LLB (Dal), MBA (Western), LLM (Dal)

Assistant Professors

Baigent, G., BEng (TUNS), MBA (St. Mary's), PhD (Kent State)
Grise, M.L., BCom, PhD (Queen's)
MacLean, B.W., BCom, MBA (Dal), CA
Sharma, P., BSc, MBA (Punjab), PhD (Calg)

Lecturers

Leach, Ed, BCom (Dal), CMA (NS), MBA (Western)

I. Bachelor of Commerce

The School of Business Administration offers a four-year undergraduate Bachelor of Commerce Degree that is a co-operative education programme. Co-operative education is an academic strategy that integrates on-campus study with off-campus work experience. The schedule for the Bachelor of Commerce co-op Programme includes seven academic terms (AT) and three work terms (WT), as follows:

Yr/Term	Fall	Winter	Summer
Year 1	AT1	AT2	FREE
Year 2	AT3	WT1	AT4
Year 3	WT2	AT5	WT3
Year 4	AT6	AT7	

The co-op programme in Commerce requires a broad and general range of studies, including required and elective classes provided by the College of Arts and Science. The programme also allows students to choose a measure of concentration in a variety of special areas.

The three work-terms each receive 1/2 credit, but constitute a full work load. (See the Regulations section of this calendar for "overload" limits and conditions.)

Students who are qualified may join the programme no later than the beginning of the second year, and will be charged a transfer fee (see Admissions and/or Fees section of this calendar).

A. Degree Requirements

- Four-year programme - 7 academic terms and 3 work-terms
- Total credits required - 20
- Required GPA for graduation - 2.00
- Required core area classes - 10 1/2 credits:

COMM 1000.03	COMM 2601.03
COMM 1501.03	COMM 2701.03
COMM 2101.03	COMM 3301.03
COMM 2102.03	COMM 3501.03
COMM 2202.03	COMM 3701.03
COMM 2203.03	COMM 4350.06
COMM 2301.03	ECON 1101.03
COMM 2401.03	ECON 1102.03
COMM 2501.03	MATH 1110.03 and MATH 1120.03
COMM 2502.03	or MATH 1000.03 and MATH 1010.03

- Core area electives - 3 ½ credits selected from Commerce, Economics or Mathematics, Statistics and Computer Science; must include at least one ½ credit selected from a list (compiled by the School of Business Administration) of approved classes in the Information Systems area beyond COMM 1501.03
- Work-terms - 1½ credits
- Non-Commerce electives - 3 full credits selected from all classes offered in the University other than Commerce
- Free electives - 1½ credits selected from all classes offered above the 1000 level, except with School approval.

NOTE: Due to the awareness of the importance of ethics and languages in the education of business managers, the School highly recommends that students consider taking PHIL 2080.06 or 2081.03: *Ethics in the World of Business*, and at least one class in French, German, Russian, or Spanish amongst their non-Commerce or Free electives.

NOTE: Students readmitted to the Commerce programme will be subject to the Academic Regulations as stated in the Calendar for the year of readmission. Students who commenced the commerce programme prior to 1997 should refer to regulations and programme structure in effect at that time. For further information, contact the School of Business, Commerce Programme Administrator, 6152 Coburg Road, (902) 494-1181. E-mail: amacinnis@mgmt.dal.ca

NOTE: The following programme applies only to students entering the programme after September 1997. Students enrolled prior to 1997 should follow the programme of the year they entered the programme.

B. Programme Guide

For their first four academic terms, students normally follow a fixed programme of study, as outlined below:

Academic Term One

- COMM 1000.03
- COMM 1501.03 (Independent Study)*
- ECON 1101.03
- MATH 1110.03 or 1000.03
- Two non-Commerce electives

Academic Term Two

- COMM 1501.03 (Independent Study)*
- COMM 2101.03
- ECON 1102.03
- MATH 1120.03 or 1010.03
- Two non-Commerce electives

Academic Term Three

- COMM 2102.03
- COMM 2202.03
- COMM 2401.03
- COMM 2501.03
- COMM 2701.03

Academic Term Four

- COMM 2203.03
- COMM 2301.03
- COMM 2502.03
- COMM 2601.03
- COMM 3701.03

NOTE: COMM 1501.03 is a half-credit class. It is suggested that the independent study section be taken. It may be available in a term offering as well.

During their fifth, sixth and seventh academic terms, students can either pursue a general programme of study, by choosing electives from a wide range of the functional areas of business, or they can follow a more specialized programme, taking their elective classes in particular areas of concentration. (Note that the Commerce programme does not have formal Majors or Minors).

The School currently offers the following Areas of Concentration:

- Accounting
- Finance (combined with either Accounting, Economics or International Business)
- Marketing/Distribution
- Information Systems
- Management

Interested students should refer to the Programme Planning Guides which are available from the School, before beginning their fifth academic term.

The professional accounting bodies allow certain exemptions in respect of classes taken in the School of Business Administration. These differ from province to province. Particulars can be obtained from the provincial offices of the Association of Certified General Accountants, the Institute of Chartered Accountants, the Society of Management Accountants, and the Chartered Institute of Secretaries.

C. Honours Programme

Honours programmes may be designed with an area of concentration in Accounting, Finance, Information Systems and Marketing. The Honours programme of each student must be approved by the Commerce Programme Administrator.

Honours Programme Requirements

The Requirements of Honours programmes are those of the BComm programme, with the following changes:

- A grade point average of at least 3.00 in all classes beyond the first year;
- A grade of at least B on a research paper to be completed during their fourth year of study in addition to their regular twenty credit programme.
- To obtain First-Class Honours, students must, in addition to the above requirements, attain a grade point average of 3.70 in:
 - All classes in the core areas of Commerce, Economics, and Mathematics (including Computing Science and Statistics); and
 - All classes taken.

Admission to Honours

Students are normally admitted to an Honours programme after completion of three years of the regular programme. Students must meet the following admission requirements:

- A grade point average of 3.00 in all classes taken in the second and third years of the BCom programme; and
- A grade point average of at least 3.30 in all classes which have been taken in the Honours field of study.

Students wishing to pursue an Honours programme should meet with the Commerce Programme Administrator before the beginning of their fifth academic term.

D. Co-op Work Terms

Work Terms

A work term is a period of time where a student gains practical experience in a work environment. Each passed work term is an academic half credit. Although the Co-op Office has an excellent job posting record, it is ultimately the student's responsibility to arrange suitable work term employment with the assistance of Co-op Coordinators. Students sign a Student Acceptance Agreement during academic term three accepting the aforementioned responsibility. The Co-op Office coordinates contact between students and employers. During a work term, students are considered an employee of their work term employer with reference

to the conditions of their employment and is a student with respect to academic evaluation only. The university does not accept liability for the student's work environment. Students are remunerated according to employer policy and the labour laws of the jurisdiction in which they work. Students are required to register for each work term and complete a written work term report. During the work term a Co-op Coordinator conducts a work site visit with both the employer and the student to ensure that the work term objectives are being met. Satisfactory performance in the work place is required. Co-op employers complete and submit an employer's evaluation detailing the student's performance level. Work terms must be a minimum of 14 weeks at 35 hours per week. Three passed work terms are required to graduate. Failure to complete the work term requirements will result in a failed work term. Work term requirements are detailed in the Student Handbook for Commerce Co-op under the Student Information section on the programme's web site at <http://www.dal.ca/commcoop>.

1. Work Term Eligibility

Only students who meet the prerequisites (see Section II: Classes Offered of this calendar) are eligible to go out on a work term. Students must be in good standing to be eligible to go on a work term. Students whose grades drop below a 1.70 GPA overall will be required to withdraw from the programme.

2. Work Term Reports

At the end of each work term, students must submit a satisfactory work term report, which is preferably related to their work term. Specific guidelines for writing this report and submission deadlines are available from the Co-op Office. A passing grade for the work term, based upon a satisfactory work term report and a favourable employer's evaluation, is required to obtain credit.

Co-op Fees

Students are required to register for their work terms and are charged a co-operative education fee. Co-op fees are divided into seven equal instalments attached to the academic terms in an effort to balance the cost. These fees are non-refundable. Students who transfer into the programme from another department or another institution are responsible for backpayments. Payment of all seven instalments are required to obtain a Bachelor of Commerce Degree. Consult the Fees section of this calendar for details.

E. Graduate Placement Assistance

The School of Business Administration has a Coordinator of Employer & Alumni Relations with a main mandate to liaise with employers and produce career opportunities for graduating students and alumni. Communicating available job opportunities to students is a key responsibility of the position. Students are also assisted in finding employment through counselling and through their participation in professional development workshops on job search techniques, interviewing and cover letter/resume writing.

F. Management Information Systems

The School of Business Administration prides itself on the use of computers in all aspects of the curriculum. Initiated under the auspices of the Courseware Development Project, the prime objectives are to bring the most advanced information technology into the classrooms and to make hardware and software resources available to the students. This initiative was made possible through generous contributions from several Canadian corporations, as well as continuing support of the Capital Campaign for Dalhousie and the Annual Fund Campaign. Through this support the School of Business Administration has become a recognized world leader in the use of information technology.

Currently all faculty members and staff have their own personal computers and students have access to a computer lab with 60 personal computers. All personal computers in the School are based on the Intel 486 family of processors. They are fully networked and run Windows software and applications. All personal computers are linked through ethernet connections to the School's two MicroVAXes, scientific workstations, as well as a host of other computers on campus. Through internet connections there is also access to computers throughout the world.

NOTE: The commerce MIS curriculum is currently being revised and new classes are expected to be offered beginning in the fall of 1998*.

* Consult the School of Business web site.

G. Exchange Programmes

Dalhousie offers Commerce and MBA students the opportunity to study abroad in a variety of countries. Students participating in exchanges gain valuable cultural insights and understanding through their studies structured for a different global perspective. Exchanges are of particular interest to students pursuing international business concentrations. Exchanges are normally available in Sweden, Denmark, Finland, France, Korea, Germany, Australia, New Zealand, and Mexico. For more information, contact the School of Business Administration International Student Exchange Office at 902-494-2224, or email international.exchange@dal.ca.

H. Bachelor of Management

The School of Business Administration will be offering a non-cooperative education management degree. Requests for information should be forwarded to the administrative office of the School of Business Administration at (902) 494-7080.

II. Classes Offered

NOTE: Consult the current timetable to determine in which term(s) each 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.

COMM 1000.03: Introduction to Business.

This class 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 range of teaching-learning methods are applied, including lectures, seminars, and case discussion. Writing and oral presentation skills are confirmed by requiring a passing grade on the assignments portion of the class. The class prepares the student for the more rigorous treatment of functional topic areas in subsequent classes and establishes a business person's perspective. **FORMAT:** Lecture 1.5 hours; tutorial/seminar 1.5 hours.

COMM 1501.03: Introduction to Computers in Business Management.

The goal of this class is to enable students to be immediately productive within an information processing system. Successful completion of this class 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 an integrated Windows-based word processing, spreadsheet and database software suite. It is strongly recommended that students complete this class in their first year of study.

Independent Study Option: This class is offered over the regular term from September to April and is a self-paced, computer-managed, instructional environment, including on-line tutorials, quizzes and electronic mail.

FORMAT: Students are responsible for completing classwork through self-study, requiring significant time be spent on computers. Topics will be delivered in discrete modules and a passing grade is required in each section of the class.

EXCLUSION: COMP 1000.03

Lectures Option: This class combines traditional lectures with a self-paced, computer managed, instructional environment, including on-line tutorials, quizzes and electronic mail.

FORMAT: Lecture 3 hours; extensive computer exercises are part of the class, requiring significant time to be spent on computers.

EXCLUSION: COMP 1000.03

NOTE: COMM 1501.03 is designed specifically for students enrolled in Commerce, and COMP 1000.03, 1200.03 or 1400.03 are not eligible as substitutes for COMM 1501.03.

COMM 2001.03: Introduction to Management.

A general business class designed to acquaint the student with current business practice. Areas of study include basic economics, current business trends, entrepreneurship, and an overview of all functional areas of business. Students will submit a viable business plan as the major project in this class. Upon completion of this class students will have gained sufficient exposure to make informed decisions as a manager or owner of a business.

FORMAT: Lecture 1.5 hours; seminar 1.5 hours

PREREQUISITE: Fourth year standing in Physiotherapy or Occupational Therapy

EXCLUSION: COMM 1000.03, COMM 3307.03

COMM 2101.03: Introductory Accounting I.

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: Lecture 3 hours; plus tutorials, as required. Computer exercises are part of the class, requiring some time to be spent in the Computer Lab.

EXCLUSION: COMM 1101.03

COMM 2102.03: Introductory Accounting II.

Emphasis is placed on the use of 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: Lecture 3 hours; plus tutorials as required; written and computer-based assignments

PREREQUISITE: COMM 2101.03

EXCLUSION: COMM 1102.03

COMM 2110.03: Accounting Database Analysis and Design.

This class provides a basic understanding of information systems, especially accounting information systems. It builds on material learned in COMM 1501.03, dealing with various hardware and software issues not covered in that class. The class emphasizes the topics of systems analysis, design, control and evaluation, and topics related to database systems. The class emphasizes instruction in, and the use of databases.

FORMAT: Lecture 3 hours; students must complete a major database design project.

PREREQUISITE: COMM 1101.03 or 2101.03, 1102.03 or 2102.03, 1501.03; or permission of the instructor.

COMM 2202.03: Finance I.

(Starting in 98/99 academic year.)

An introduction to the problems faced by business managers in the acquisition and effective use of the firm's resources, and analytical concepts for evaluating financial decisions. Topics covered are: Financial ratio analysis, financial planning, time value of money (present and future value), working capital management, and a brief introduction to capital budgeting.

FORMAT: Lecture 3 hours

PREREQUISITE: COMM 1000.03, 1101.03 or 2101.03; ECON 1101.03 and 1102.03

CO-REQUISITE: COMM 1102.03 or 2102.03

EXCLUSION: COMM 2201.03

COMM 2203.03: Finance II.

(Starting in Summer 1999.)

This class provides students with an overview of the theory of corporate finance and its application to the problems faced by financial managers. This class covers an in-depth study of capital budgeting and long term investment decisions in national and international contexts, capital structure, dividend policy, lease financing, and the fundamentals of options and futures.

FORMAT: Lecture 3 hours

PREREQUISITE: COMM 2202.03

EXCLUSION: COMM 3201.03

COMM 2301.03: 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 behavioral 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

PREREQUISITE: COMM 1000.03 and 1501.03, ECON 1101.03 and 1102.03

COMM 2302.03: Organizational Theory and Design.

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: COMM 2301.03

EXCLUSION: COMM 3302.03 (formerly), COMM 3301.03

COMM 2401.03: 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 to 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 1.5 hours; seminar 1.5 hours

PREREQUISITE: COMM 1000.03 and 1501.03; ECON 1101.03 and 1102.03; COMM 1101.03 or 2101.03

EXCLUSION: COMM 1401.03 (formerly)

COMM 2501.03: 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: COMM 1000.03 and 1501.03; ECON 1101.03 and 1102.03; MATH 1110.03 and 1120.03; or permission of the instructor

EXCLUSION: MATH 1060.03; STAT 1060.03; ECON 2260.03

COMM 2502.03: Statistics for Business II.

A continuation of COMM 2501. Topics covered include ANOVA, chi-square, non-parametric statistics, 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

PREREQUISITE: COMM 2501.03 or MATH 1060.03 or 2060.03, or STAT 2060.03, or ECON 2260.03; or permission of the instructor

EXCLUSION: MATH 2080.03, STAT 2080.03, ECON 2280.03

COMM 2601.03: Legal Aspects of Business - Contracts.

This class 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 2602.03: Commercial Transactions.

This follow-up to COMM 2601.03 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: COMM 2601.03

COMM 2701.03: Business Communication.

The goal of this class is to teach students how to properly prepare both written and oral business communications. 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

COMM 2801.03: Work-Term One, Bachelor of Commerce Co-op.

Students who are registered for the workterm receive ½ academic credit upon completion of the following:

- 16 weeks of employment in an approved position. Students are aided in their job search by the Co-op Office, but the student is ultimately responsible for finding suitable employment. The Co-op Office helps students by posting job opportunities, assisting students with the job search, and assessing the appropriateness of self-found jobs. Satisfactory performance in the workplace is expected and employers will submit an evaluation for students in the programme;
- An acceptable workterm report, prior to the commencement of the next academic term. Guidelines for the report and deadlines are distributed through the Co-op Office.

Credit is granted based on successful completion of the workterm report, but consideration is also given to the content of employer evaluations.

PREREQUISITE: Successful completion of at least 7 full credits, of which at least 5 credits must be in the Core Area (Commerce, Economics, Mathematics/Statistics/ Computing Science).

COMM 3100.03: Financial Accounting and Statement Analysis.

This class is intended for non-accounting students. The approach to the class 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

PREREQUISITE: COMM 1101.03 or 2101.03, 1102.03 or 2102.03

EXCLUSION: COMM 2111.03, 3111.03

COMM 3101.03: Managerial Accounting and Decision Making.

The class applies, through a combination of case analysis and problem-solving, managerial accounting concepts to the planning and controlling activities in organizations. Coverage includes both manufacturing and non-manufacturing activities. This class is intended for students not concentrating in accounting.

FORMAT: Lecture 3 hours

PREREQUISITE: COMM 1101.03 or 2101.03, 1102.03 or 2102.03

EXCLUSION: COMM 3112.03

COMM 3111.03: Intermediate Financial Accounting Procedures.

This class and its follow-up, COMM 3113.03, are meant to provide an understanding of corporate financial reporting and the related conceptual framework. The class develops technical expertise in various financial accounting topics, some of which were introduced in COMM 2101.03 and 2102.03. The focus is on understanding the implicit inter-relationships in the framework and the environmental factors that work to establish GAAP (generally accepted accounting principles).

FORMAT: Lecture 3 hours

PREREQUISITE: COMM 1101.03 or 2101.03 and 1102.03 or 2102.03

with an average of at least B-

EXCLUSION: COMM 3100.03; COMM 2111.03 (formerly)

CROSS-LISTING: BUSI 6108.03

COMM 3112.03: Cost Accounting.

The purpose of this class 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 class is intended primarily for students who plan to concentrate their studies in the accounting area. Students who wish to take a class in cost/managerial accounting beyond the introductory level, but do not plan to pursue a career in accounting, should consider taking COMM 3101.03 instead of this class.

FORMAT: Lectures/case discussions 3 hours

PREREQUISITE: COMM 1101.03 or 2101.03 and 1102.03 or 2102.03,

with at least a B- average

EXCLUSION: COMM 3101.03; COMM 2112.03 (formerly)

CROSS-LISTING: BUSI 6106.03

COMM 3113.03: Intermediate Financial Accounting Theory.

This class and its prerequisite, COMM 3111.03, are meant to provide an understanding of corporate financial reporting and the related conceptual framework. The class 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: COMM 3111.03 (formerly 2111.03) or permission

of the instructor

EXCLUSION: COMM 3100.03

COMM 3114.03: External Auditing.

This class covers the theory and practice of public auditing according to generally accepted auditing standards (GAAS). The first half of the class 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 class considers typical audit programmes for examination of balance sheet and income statement accounts.

FORMAT: Lecture 3 hours
PREREQUISITE: COMM 2110.03, 3111.03 (formerly 2111.03)
CROSS-LISTING: BUSI 6101.03

COMM 3120.03: Information for Organizational Control.

This class has two major objectives: to study the planning/control function and the value of management accounting information to this function, and to examine the management control implications of different organizational forms and different strategies. The major topics include: management control implications of modern control methods (such as just-in-time systems, costs of quality, and productivity measurement) and different strategies; measurement of the value of information using both certainty (for example, linear programming) and uncertainty (such as decision theory application to the variance investigation decision and C-V-P) models; evaluation of the different types of responsibility centres; use of profit variance analysis as a performance evaluation tool; and management compensation.

FORMAT: Lecture/case analysis/problem-solving 3 hours
PREREQUISITE: COMM 3112.03, 2301.03, 2502.03 or permission of instructor
CROSS-LISTING: BUSI 6107.03

COMM 3201.03: Intermediate Finance.

A more intensive study of capital budgeting, cost of capital and valuation theory than that of COMM 2201.03. The class 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
PREREQUISITE: COMM 2201.03
CO-REQUISITE: One of 3111.03 (formerly 2111.03), 3112.03, 3100.03 or 3101.03
EXCLUSION: COMM 2203.03

COMM 3202.03: Security Analysis.

Introduces the theory and philosophies of investment, and concentrates on security analysis using computers 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 security analysis on a problem-solving basis.

FORMAT: Lecture 3 hours
PREREQUISITE: COMM 2202.03, 2502.03; ECON 2201.03

COMM 3203.03: 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
PREREQUISITE: ECON 2201.03; COMM 2201.03. The former may be waived with the consent of the instructor.

COMM 3206.03: Portfolio and Money Management.

This class is designed to provide the students with an overview of the Modern Portfolio Theory and its application to the real world. In particular, a considerable effort will be made to compare and contrast the activities of money managers with the ones that are promoted in various theories. The intention is to provide our students with the needed skills to successfully face the challenging world of portfolio and money management.

FORMAT: Lecture/seminar 3 hours
PREREQUISITE: COMM 2202.03 and 2203.03

COMM 3301.03: Organizational-Management Skills.

This class will be offered for the first time in January 2000, and is currently under development.

COMM 3303.03: Introduction to Human Resource Management.

The role of human resource management and administration of the personnel function are analyzed, along with the major aspects of the personnel function: job analysis, human resource planning, selection, training, performance appraisal, compensation, labour relations, safety and health, and team building. Knowledge of the processes is supplemented by the development of analytical skill in coping with various human resource 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 COMM 2301.03. Cases simulate work environments.

FORMAT: Lecture 3 hours
PREREQUISITE: COMM 2301.03

COMM 3304.03: Labour - Management Relations.

Introduces students to some practical and theoretical aspects of labour-management relations in Canada. Examines historical, legal, behavioral, economic and political backgrounds 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
PREREQUISITE: COMM 2301.03 or instructor consent

COMM 3305.03: 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. 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
PREREQUISITE: COMM 2301.03 or permission of instructor

COMM 3307.03: New Venture Creation.

This class 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 class, 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 ideas. A major field project requires the development of a detailed business plan for the new venture.

FORMAT: Lecture 3 hours
PREREQUISITE: COMM 2102.03, 2201.03, and 2401.03, or permission of instructor

COMM 3308.03: Managing the Family Enterprise.

Family enterprises dominate the business landscape of Atlantic Canada with business such as Sobey's, Irvings, and McCains. In addition, a number of smaller businesses are family-owned and operated too. With over 65% of all businesses in Canada being family firms, the likelihood of your encountering a family firm as a family member that owns the business, or as an employee, a customer, or a supplier is extremely high. While these firms are similar to non-family firm in some respects, they are quite unique in others. This class provides you with a state-of-the-art treatment of critical issues that confront these firms. It addresses issues as challenges and strengths of family firms, inter-generational dynamics, sibling

relationships, managing of conflict, succession planning and transfer of power from one family member to another, professionalization and strategic management of family firms. The class provides you with an opportunity for extensive interaction and discussion in class, as well as to view a family firm closely through a field project. In addition, you are exposed to some professionals who deal with family firms.

FORMAT: Lecture/discussion 3 hours

PREREQUISITE: COMM 2102.03, 2201.03, 2401.03, or permission of the instructor.

CROSS-LISTING: BUSI 6006.03

COMM 3309.03: Management Skills Development.

This class will expose students to key knowledge, skills, and attitudes (KSAs) considered critical to managerial success. Such an exposure is designed to provide the students with behaviours which will help ensure that, when managing human resources, staff will perform at or near peak capabilities. Topic areas include: understanding what the successful manager needs to know, understanding the personal self, communications, interpersonal negotiations, goal setting, managing innovation and change, handling conflict and anger, performance evaluation, counselling and feedback, and management attitudes needed for success.

Significant amounts of classroom time will be devoted to behaviour modelling exercises, role plays, case studies, and group discussions.

FORMAT: Lecture/discussion 3 hours

PREREQUISITE: COMM 2302.03, or permission of the instructor

COMM 3401.03: 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 behavioral 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: COMM 2401.03

CROSS-LISTING: BUSI 5402.03

COMM 3402.03: 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.

FORMAT: Lecture/case method/applied project work 3 hours

PREREQUISITE: COMM 2401.03

COMM 3404.03: 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

PREREQUISITE: COMM 2502.03, 2401.03

COMM 3405.03: Export Marketing.

The class 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

PREREQUISITE: COMM 2102.03, 2401.03; ECON 1101.03 and 1102.03

COMM 3406.03: 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 class is the completion of a strategic plan for a retail business concept.

FORMAT: Lecture/case method/applied project work 3 hours

PREREQUISITE: COMM 2202.03, 3401.03, 3410.03

COMM 3407.03: 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.

PREREQUISITE: COMM 3410.03 and 3501.03, or permission of the instructor

CROSS-LISTING: BUSI 6407.03

COMM 3408.03: Transportation Modes and Policy.

This class 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

CO-REQUISITE: COMM 3410.03, or permission of the instructor

CROSS-LISTING: COMM 6406.03

COMM 3409.03: Sales Management.

This class 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

PREREQUISITE: COMM 2401.03

CO-REQUISITE: COMM 2202.03, 2301.03, 3101.03

EXCLUSION: COMM 2402.03 (formerly)

CROSS-LISTING: BUSI 6405.03

COMM 3410.03: 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 class reviews theory and practice in this field of management, employing case analysis and projects to enhance student learning.

FORMAT: Lecture/discussion 3 hours

PREREQUISITE: COMM 1102.03 or 2102.03, 2401.03, 2202.03, 2301.03, or permission of the instructor.

EXCLUSION: Prior to 1988/89, this class was numbered COMM 2401.03. Credit will be given for only one of COMM 2401.03 (taken prior to 1988/89) and COMM 2403.03 (taken after 1987/88) and COMM 3410.03

COMM 3411.03: Special Topics in Marketing.

The focus of marketing has shifted from the use of advertising, promotion and long distribution channels to more direct forms of communication and distribution. These changes have been a result of the traditional power struggle among channel members and the manufacturers of products and services, where manufacturers have sought to maintain direct contact with their customer. The move toward direct marketing is fueled today largely by technological developments in database storage and mining, the development of relationship marketing, and the introduction of new media such as the Internet.

The skills required in direct marketing are in strong demand within the Canadian economy where job opportunities for marketing graduates grew 40% in 1996. This class focuses on the development of a direct marketing strategy that requires an understanding of the tools of direct marketing, the creative process, and how direct marketing fits into the total marketing strategy.

This is a very applied class that will have guest speakers and industry projects. It is designed to compliment the Marketing Informatics class that focuses more on the total information needs, acquisition and usage within a firm for purposes of marketing.

COMM 3501.03: 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 class 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)

PREREQUISITE: COMM 2201.03, 2301.03, 2401.03, 2501.03

COMM 3511.03: Management Information Systems.

Students of both private and public enterprise can look forward to working in dynamic environments characterized by networked enterprises and global markets. Fast communications across the enterprise and easy collaboration among work groups have become vital keys to business success. Information technology (IT) is a critical component in these environments, and the ability to develop, use and manage the information systems that use IT is an essential skill. This class is an introduction to the concepts and issues that you will need to become an effective user or manager of information systems. You will gain a broad understanding of how information systems are used in organizations, the technologies that influence their use, how they need to be managed, and the impact that they can have on an organization's competitive strategy and structure. FORMAT: This class is delivered ON-LINE, using the World Wide Web and electronic mail. Much of it is self-paced, and places a demand on the student for self-discipline and hard work. You are required to come to class for the introductory session, the midterm exam and the final. In addition, optional tutorial sessions are offered weekly to answer your questions.

CROSS-LISTING: BUSI 5511.03, LIBS 5505.03, PUAD 6925.03

COMM 3701.03: The Firm in the International Environment.

As an introduction to international business, this class examines the principal methods of doing business abroad and the dimensions of the international business environment that are important to each. Successful trade and investment 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 class also examines

the theory of the multinational enterprise, along with methods for analyzing the economic, political and social dimensions of host countries.

PREREQUISITE: COMM 2102.03, 2201.03; ECON 2200.03 or 2201.03

COMM 3801.03: Work-Term two, Bachelor of Commerce Co-op.

Students who are registered for the workterm receive ½ academic credit upon completion of the following:

- a) 16 weeks of employment in an approved position. Students are aided in their job search by the Co-op Office, but the student is ultimately responsible for finding suitable employment. The Co-op Office helps students by posting job opportunities, assisting students with the job search, and assessing the appropriateness of self-found jobs. Satisfactory performance in the workplace is expected and employers will submit an evaluation for students in the programme;
- b) An acceptable analytical workterm report pertaining to the student's area of study or employment, prior to the commencement of the next academic term. Guidelines for the report and deadlines are distributed through the Co-op Office.

Credit is granted based on successful completion of the workterm report, but consideration is also given to the content of employer evaluations.

PREREQUISITE: At least 9½ full credits earned, including COMM 2801.03 and at least 7 other credits in the Core Area (Commerce, Economics, and Mathematics/Statistics/ Computing Science).

COMM 3802.03: Work-Term three, Bachelor of Commerce Co-op.

Students who are registered for the workterm receive ½ academic credit upon completion of the following:

- a) 16 weeks of employment in an approved position. Students are aided in their job search by the Co-op Office, but the student is ultimately responsible for finding suitable employment. The Co-op Office helps students by posting job opportunities, helping students with the job search, and assessing the appropriateness of self-found jobs. Satisfactory performance in the workplace is expected and employers will submit an employee evaluation for students in the programme;
- b) an acceptable analytical workterm report pertaining to the student's area of study or employment, prior to the commencement of the next academic term. Guidelines for the report and deadlines are distributed through the Co-op Office.

Credit is granted based on successful completion of the workterm report, but consideration is also given to the content of employer evaluations.

PREREQUISITE: At least 12 full credits earned, including COMM 3801.03 and at least 9 ½ other credits in the Core Area (Commerce, Economics, and Mathematics/Statistics/ Computing Science).

COMM 4101.03: Advanced Topics in Accounting I.

This class 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 classes.

FORMAT: Lecture 3 hours

PREREQUISITE: COMM 3111.03, 3112.03 and 3113.03, or permission of the instructor

CROSS-LISTING: BUSI 6110.03

COMM 4102.03: 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

PREREQUISITE: COMM 3111.03 and 3113.03, or permission of the instructor

CROSS-LISTING: BUSI 6109.03

COMM 4114.03: Computer Systems Controls.

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 class 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 class 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

PREREQUISITE: COMM 2110.03

COMM 4120.03: Taxation.

An introduction to the taxation system in Canada, with special reference to the provisions of the Income Tax Act 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

PREREQUISITE: COMM 1101.03 or 2101.03; ECON 1101.03 and 1102.03

CROSS-LISTING: BUSI 6102

COMM 4121.03: Advanced Taxation.

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 consisting of seminar presentations of researched topics by students

PREREQUISITE: COMM 4120.03

CROSS-LISTING: BUSI 6103

COMM 4201.03: International Financial Management.

This class 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: COMM 1102.03 or 2102.03, 2201.03, 2502.03; ECON 2200.03 or 2201.03

CROSS-LISTING: BUSI 6807.03

COMM 4250.03: Theory of Finance.

This class is intended to enhance students' understanding of the theory of finance to a level which enables them to critique current research published in journals and to apply selected research to financial management issues. This class is designed with the assumption that students have a background in financial economics. In addition to the main text, several journal articles will be reviewed in each area. Seminar style classes will feature discussion and student participation.

FORMAT: Seminar 2 hours

PREREQUISITE: Concentration in Finance and permission of Instructor

CROSS-LISTING: BUSI 6250.03

COMM 4350.06: Strategic Management.

This is the capstone class of the Commerce programme. This class views the organization from a holistic perspective and is aimed to understand and evaluate the strategic directions taken by organizations. The focus remains on decision-making from the viewpoint of senior and middle managers. As such, it integrates the concepts and techniques developed in earlier classes, as well as those learned during the work terms. Various pedagogical methods are used to develop and enhance the analytical, writing, and presentation skills required in today's business environment. Students are exposed to a wide variety of organizations and contexts through case studies. In addition, small groups of students are required to undertake a field project in which they examine an organization closely, identify its existing strategy, potential growth opportunities, and suggests strategic directions for this organization.

FORMAT: Lecture 3 hours

PREREQUISITE: At least 12.5 credits earned, including COMM 3801.03 and at least 9 other credits in the Core area (Commerce, Economics and Mathematics/Statistics/ Computing Science).

COMM 4401.03: Marketing Strategy.

This class 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 class aims to improve decision-making skills in managing product/market portfolios and implementing marketing strategies. As a capstone class, it is designed to permit the integration of learning from other marketing classes. Instruction is mostly through case study discussions, report writing, and group presentations.

FORMAT: Seminar 3 hours

PREREQUISITE: COMM 2401.03, 3401.03, 3404.03; and one other marketing class (3410.03 - formerly 2403.03 - recommended)

COMM 4402.03: 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

PREREQUISITE: COMM 2401.03, 3404.03, and at least two other half classes in marketing

COMM 4413.03: Marketing Informatics.

Technological developments in database storage and mining, the development of relationship marketing, the rise of direct marketing and introduction of new media such as the internet have revolutionized the way marketing is conceptualized and executed. This revolution in marketing requires marketers who have a whole new set of skills and knowledge focused on the application of technology and associated practices. These skills are required in the growth areas of marketing practice such as direct marketing, where demand for marketing graduates grew 40% in 1996. Large companies require marketers with the skills necessary to work with IT people to develop effective customer information files and design customer database files which combine information from the customer information files and information from other sources. They need to be able to use datamining tools and techniques to understand buyer behaviour, identify relevant segments, and develop effective strategies using all of today's new media and channels.

This class is designed to capitalise on the skills students have developed in database management, data analysis and mining, buyer behaviour and research methods.

FORMAT:

PREREQUISITES: COMM 2401.03, COMM 3401.03, COMM 3404.03

NOTE: COMM 4516 Recommended

COMM 4501.03: Operations Research.

The goal of this class is an understanding of the major O.R. techniques and how to apply them, not their theoretical development. Topics include: linear programming formulation,

simplex method, sensitivity, integer variables, transportation, network problems, and dynamic programming. Cases are used to illustrate the main topics.

FORMAT: Two 1.5 hour lectures

PREREQUISITE: COMM 1501.03 and 2502.03, or permission of the instructor

CROSS-LISTING: BUSI 6501.03

COMM 4534.03: 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.

PREREQUISITE: All required core area classes, except COMM 4350.06, or consent of instructor

CROSS-LISTING: BUSI 6553.03

COMM 4538.03: 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 that introduces the user to the concepts underlying the techniques. Students use and interpret statistical programmes with data sets from such business areas as marketing, finance and organizational behaviour.

PREREQUISITE: Mathematics at the 1000 level; COMM 1501.03 and 2502.03, or consent of instructor

CROSS-LISTING: BUSI 6504.03

Computer Science

See DalTech section of this calendar.

Comparative Religion

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I. 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.

See "Degree Requirements" for complete details.

A. Advanced Major in Comparative Religion

Departmental Requirements

1000 level

- COMR 1070.03
- COMR 1300.03 or 1301.06

2000 level

- Select 2 classes from: COMR 2001.03, 2002.03, 2003.03
- Select 2 classes from: COMR 2011.03, 2012.03, 2013.03;
- Select 1 other credit at or above 2000 level

3000 level

- At least two and one half credits at or above 3000 level

4000 level

- At least one half credit at 4000 level

B. Major in Comparative Religion

Departmental Requirements

1000 level

- COMR 1070.03
- COMR 1300.03 or 1301.06

2000 level

- Select 2 classes from: COMR 2001.03, 2002.03, 2003.03
- Select 2 classes from: COMR 2011.03, 2012.03, 2013.03

3000 level

- At least one and one half credits at 3000 level or above

4000 level

- At least one half credit at 4000 level

This programme provides Comparative Religion majors 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. Faulkner.

Please consult the current timetable to determine which classes are being offered.

II. 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.

NOTE: All classes are not offered this year, consult the current timetable for current offerings.

COMR 1000.06: Introduction to World Religions.

This class is no longer offered; it has been replaced with COMR 1070.03 and 2070.03.

COMR 1070.03: Introduction to World Religions.

This class will focus on a comparative study of Christianity and some of the other major world religions. There will be a brief introduction to the geographical and historical distribution of world religions and to their basic ideas and concerns, with an emphasis on some fundamental and general questions in comparative studies: What materials in different traditions are comparable? What intellectual and psychological attitudes are required for such a study? Does one have to have a religion in order to be spiritual? Can one belong to a religion and be open to the study of other religions?

INSTRUCTOR: R. Ravindra

FORMAT: Lecture

EXCLUSION: COMR 1000.06 and 2000.06

COMR 1300.03: Explorations in Religion.

The description and understanding of religion requires diverse approaches: historical, psychological, sociological, philosophical. It also requires that knowledge of oneself go hand in hand with knowledge of the human phenomenon of religion. This class introduces the student to basic concepts in the academic study of religion and to some of the most recent scholarship in the area.

INSTRUCTOR: C.T. Faulkner

FORMAT: Lecture 3 hours

*COMR 1301.06: 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 fulfills the first-year Writing Requirement. A detailed syllabus is available from the Department of Comparative Religion.

INSTRUCTOR: C.T. Faulkner.

FORMAT: Writing Requirement, lecture 2 hours, section meeting 1 hour

*COMR 2001.03: 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. Faulkner

FORMAT: Lecture/seminar 3 hours

*COMR 2002.03: 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 83% of Canadians.

INSTRUCTOR: C.T. Faulkner

FORMAT: Lecture/seminar 3 hours

*COMR 2003.03: 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 250,000 live in Canada.

INSTRUCTOR: C.T. Faulkner

FORMAT: Lecture/seminar 3 hours

*COMR 2011.03: 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 seven hundred million Hindus reside. This religion is said to be eternal, without any human founder, although continually vitalised 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 3 hours

PREREQUISITE: Students should be in second year or above

*COMR 2012.03: 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 humanity today. These days, many Westerners are also drawn to the practical and holistic views of Taoism and Confucianism.

This class will provide an introduction to the major religious traditions in China and Japan, namely, Taoism, Confucianism, Buddhism and Shintoism.

INSTRUCTOR: R. Ravindra

FORMAT: Lecture 3 hours

PREREQUISITE: Students should be in second year or above

*COMR 2013.03: 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 meditational 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 3 hours

PREREQUISITE: Students should be in second year or above.

COMR 2070.03: Comparative Study of Scripture.

This class will focus on a study of sacred literature. After a discussion of the salient nature of scripture in various religions, the bulk of the class will be devoted to a comparative study of the Gospels, especially *The Gospel According to St. John*, and *The Bhagavad Gita*, particularly around the themes of love, knowledge, action, discipleship and yoga.

INSTRUCTOR: R. Ravindra

FORMAT: Lecture/seminar

PREREQUISITE: Students should be either in second year or above, or should have taken COMR 1070.03

*COMR 3002.06: 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. Faulkner

FORMAT: Lecture/seminar 3 hours

PREREQUISITE: At least one of COMR 2001.03, COMR 2002.03, COMR 2003.03 or permission of the instructor

*COMR 3003.06: 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 16th century to the present, a variety of answers will be explored. A detailed syllabus is available from the Department of Comparative Religion. Approved with Canadian Studies.

INSTRUCTOR: C.T. Faulkner

FORMAT: Lecture/seminar 3 hours

PREREQUISITE: At least one of COMR 2001.03, COMR 2002.03, COMR 2003.03 or permission of the instructor

CROSS-LISTING: HIST 3228.06

COMR 3004.03: Religion and International Development.

The religious traditions of First World and Third World alike affect how people respond to certain practical questions. Why should I work hard? Ought we to co-operate or compete? Is my exploitation of the natural world subject to any restrictions? Is my neighbor an enemy? What is true wealth and how should it be distributed? Do men and women have different roles to play? A detailed syllabus is available from the Department of Comparative Religion.

INSTRUCTORS: R. Ravindra, C.T. Faulkner

FORMAT: Seminar 3 hours

PREREQUISITE: At least one of COMR 2001.03, 2002.03, 2003.03, 2011.03, 2012.03, 2013.03

***COMR 3005.03: 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 crisis of religious views on war in the nuclear age.

INSTRUCTOR: C.T. Faulkner

FORMAT: Lecture/seminar 3 hours

PREREQUISITE: At least one of COMR 2001.03, 2002.03, 2003.03, 2011.03, 2012.03, 2013.03 or permission of the instructor

***COMR 3006.03: 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. Faulkner

FORMAT: Lecture/seminar 3 hours

PREREQUISITE: At least one of COMR 2001.03, COMR 2002.03, COMR 2003.03 or permission of the instructor

***COMR 3007.03: 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. Faulkner

FORMAT: Lecture/seminar 3 hours

PREREQUISITE: at least one of COMR 2001.03, COMR 2002.03, COMR 2003.03 or permission of the instructor

COMR 3008.03: 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: Lecture/discussion 2 hours

PREREQUISITE: HIST 2001.03 or HIST 2002.03 or HIST 2120.03

RECOMMENDED: HIST 1001.03

EXCLUSION: Former HIST 3021.03 and 3022.03 students

CROSS-LISTING: HIST 3002.03

***COMR 3014.03: Love and Death in World Religions.**

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/seminar 3 hours

PREREQUISITE: A class in Comparative Religion or the permission of the instructor; students must be in third-year or above

***COMR 3015.03: 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/seminar 3 hours

PREREQUISITE: A class in Comparative Religion or the permission of the instructor; students must be in third-year or above

***COMR 3532.03: 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 half is devoted to understanding the many levels of human consciousness based on these disciplines. The second half 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: Lecture/seminar 3 hours

PREREQUISITE: A class in Comparative Religion or in Science (preferably both); students must be in third-year or above

EXCLUSION: COMR 3531.06

CROSS-LISTING: PHYC 4020.03

***COMR 3533.03: 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 - Taoist 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: Lecture/seminar 3 hours

PREREQUISITE: A class in Comparative Religion or in Science (preferably both); students must be in third-year or above

EXCLUSION: COMR 3531.06

***COMR 4310.03: Topics in Comparative Religion/*COMR 4320.03: 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 Goddess, Feminine in World Religions*, *Death, The Soul, Suffering*). 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

Contemporary Studies

Location: University of King's College
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Telephone: (902) 422-1271
Fax: (902) 423-3357

Dean

Taylor, G.D., BA, PhD (Penn)

Director

Edwards, E.

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Glowacka, D., MA (Wroclaw), MA, PhD (SUNY)
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Teaching Staff at Dalhousie University:

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I. 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 programme in Contemporary Studies (CSP). This combined-honours BA programme 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 programme consists of integrated and interdisciplinary classes. These classes are taught by specialists from a number of disciplines. 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 Contemporary Studies Programme 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 more specialized future training at the graduate or professional level, the Contemporary Studies Programme 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 Contemporary Studies Programme students will take an active role in organizing certain events each year, including lectures, debates, and exhibitions.

II. Degree Programmes

The departmental offerings within the Contemporary Studies Programme at Dalhousie include the other honours subject and a number of possible electives. The other honours subject must be selected from the following list of Dalhousie departments and programmes: Classics, English, French, German, History, International Development Studies, Music, Philosophy, Political Science, Russian, Sociology and Social Anthropology, Spanish, Theatre and Women's Studies. Electives may be taken in any of the above-mentioned departments and programmes as well as Comparative Religion and Music. In addition, some professors in the Dalhousie Faculty of Arts and Social Sciences are members of the Contemporary Studies teaching staff and offer classes at King's.

A. Combined Honours

All students must meet the distribution requirements of the Faculty of Arts and Social Sciences as detailed in the Degree Requirements section of this calendar. Students who are eligible to take an honours degree are urged to apply to the Contemporary Studies Programme. 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.

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 member of the Contemporary Studies teaching staff.

All Contemporary Studies Programme 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 credits required 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 1000.06, CLAS 1010.06, CLAS 1021.03 and CLAS 1022.03, CLAS 1100.06;
 - Comparative Religion: COMR 1000.06/2000.06;
 - English: ENGL 1000.06;
 - History: HIST 1001.03, HIST 1002.03, HIST 1050.06, HIST 1100.06, HIST 1200.06, HIST 1300.06, HIST 1400.06;
 - Music: MUSC 1000.06, MUSC 1350.03 and MUSC 1351.03;
 - Philosophy: PHIL 1000.06, PHIL 1010.06;
 - Political Science: POLI 1100.06, POLI 1103.06, POLI 1501.06;
 - Sociology and Social Anthropology: SOSA 1000.06, SOSA 1050.06, SOSA 1100.06, SOSA 1200.06;
 - Spanish: SPAN 1100.03;
 - Mathematics: MATH 1001.03 and MATH 1002.03.
- (2) A normal requirement 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 that students complete fifteen full classes beyond the first year of study.
- (4) The three 'core' classes in Contemporary Studies: CTMP 2000.06, CTMP 3000.06, CTMP 4000.06.

- (5) An honours qualifying examination. 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. In a joint honours programme, students may obtain this grade in either of the honours subjects. Students fulfilling this requirement in Contemporary Studies submit a research paper and defend it at an oral examination. This process is sustained by CTMP 4500.06, the Honours seminar.

Students may take an Independent Readings 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 and the director is necessary in order to take these classes, and their availability is strictly limited.

iii. Classes offered at the University of King's College

CTMP 2000.06: Modern Social and Political Thought

This class will examine some of the most important debates in modern social and political thought. The twentieth-century context of these debates will be explored, but the class will also highlight ideas and developments in the nineteenth century. Particular attention will be paid to changes in music and painting during this period. Writers to be considered include Kant, Marx, Nietzsche, Heidegger, Derrida, Foucault, and Habermas. Movements to be discussed include German Idealism, Romanticism, Marxism, Existentialism, Phenomenology, Structuralism, Post-Structuralism, and Critical Theory.

INSTRUCTOR: K. Kierans
FORMAT: Lecture/tutorial

CTMP 2010.06/CTMP 3010.06/CTMP 4010.06: The Lecture Series.

Each year a lecture series class is offered. Student 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. In 1995-96 the subject was modern technology; in 1996-97 between "Ethics and Aesthetics"; in 1997-98 "Wagner's Ring Cycle: Leitmotiv of the Contemporary?"; 1998-99 topic to be announced.

INSTRUCTOR: Staff

FORMAT: Class/seminar/evening lectures

CTMP 2100.03: Revolution, Politics, History I.

The French Revolution transformed the whole range of political institutions as well as the whole vocabulary of political relations in the West. This class explores some of the most important themes of moral and political life in the period of the French Revolution, with emphasis not only on the origin of revolutionary thought, but on its continuing influence in our own time. The class considers a number of writers including Rousseau, Kant, Fichte, and Constant. We examine these writers both on their own terms and in relation to present-day debates about the tendency and result of revolutionary political thought. Literary and artistic works are studied to supplement lectures and class discussions.

INSTRUCTOR: K. Kierans

FORMAT: Lecture and tutorial 3 hours

CTMP 2101.03: Revolution, Politics, History II

This class studies the revolutionary nature of political and cultural change in the nineteenth century. We begin with an examination of Hegel's philosophy and its relation to politics and religion in the modern world. We then discuss how Feuerbach and others of his generation rejected - or reworked - Hegel's concept of modernity, and continue with an assessment of Marx and Kierkegaard. The class considers the ways in which these and other nineteenth-

century writers have shaped present-day debates about the nature of revolutionary change in the modern world. Literary and artistic works are used to supplement lectures and class discussions.

INSTRUCTOR: K. Kierans

FORMAT: Lecture and tutorial

CTMP 2190.03: The Thought of Ludwig Wittgenstein.

Ludwig Wittgenstein (1889-1951) is, perhaps with Heidegger, the most influential philosopher of our century. He was a founding genius of two distinct philosophical movements (sometimes called Ideal Language Philosophy and Ordinary Language Philosophy). Although born and raised in Vienna, he studied philosophy with Bertrand Russell at Cambridge, and returned there in 1929 to work. His extraordinary influence on philosophy is the result of his teaching small groups of dedicated students. Published for the most part posthumously, his writings, too, have made of him a philosopher's philosopher.

Nevertheless, his fame has been sufficient that his influence has extended well beyond the questions about the foundations of logic and language which preoccupied him. This class will explore some of the broader implications of his work, touching on music, art and architecture, on anthropology and psychology, and on ethics and religion, as well as on his central contributions to the philosophy of language and mind.

INSTRUCTOR: S. Burns

FORMAT: Seminar/tutorial

EXCLUSION: CTMP 2111.03

CTMP 2200.06: History of Modern Science.

This class will be an introduction to the history of modern science, from its beginnings in the Scientific Revolution up to the institutions and professions of twentieth-century "Big Science". Going beyond a straight history of scientific "ideas", we shall examine the social and cultural place of science and its claim to overarching truths in each historical period. Students will be required to research an historical paper and participate in small tutorials.

INSTRUCTOR: G. McOuat

FORMAT: Lecture/tutorial

CTMP 2203.03: Bio-Politics: Social-Darwinism and Its Discontents.

For moderns, biology and politics are intimately braided. In one sense, the modern marks the beginning of what Michel Foucault has called "biopolitics" — the meshing of (mechanical) views of the body with concepts of the body-politic. In late modernity, evolutionary theory shattered the last boundary between the natural and the human, permitting a wholly "naturalist" and historical explanation of the social and the human. For theorists as diverse as Herbert Spencer and, lately, Richard Rorty, the implications for social and moral theory are as enormous as they are diverse. This course will examine the history and meanings of this deference to biological explanations. We shall begin with an examination of the nature of "naturalist" explanations in their pre-Victorian contexts and move up to recent attempts at replacing social, epistemological and philosophical problems with biology. Topics will include, "biopolitics and the body", "contextualising the Darwinian revolution — nature red in tooth and claw", "the ends of the teleological", Socialist Darwinism, the "scale of nature" and the place of women, race-science and eugenics, the rise of sociobiology, and the power of so-called "naturalist" explanations in modern social and political thought.

INSTRUCTOR: G. McOuat

FORMAT: Seminar

CTMP 2301.03: Pain.

What does pain mean? This course will investigate the uses of pain in the contemporary world, and in doing so, it will approach various sites where pain matters, examining different discursive practices which attempt to speak of pain - or alternatively, claim that pain is what cannot be spoken. We will discuss the experience of the body in pain, and the relation of pain to knowledge. In the interest of interdisciplinarity, it is anticipated that guest lecturers in neurophysiology will participate, as well as those from, for example, Amnesty International. Topics to be addressed will include pain in

a medical context; torture and the political uses of pain; the relation between pain and privation; the expressibility of pain. Ultimately, the aim of the course is towards the question of the uses of pain in legitimizing art: we will examine two archetypes of 'the tortured artist', Sylvia Plath and Jackson Pollock, and will inquire into recent theories of the sublime in art which stress the conjunction of pleasure and pain in the most heightened and extreme aesthetic experiences.

INSTRUCTOR: E. Edwards
FORMAT: Seminar

CTMP 2311.03: From Symbolism and Surrealism to the New Novel and Beyond.

Questions of Perception, Image and Presence: Analysis of the interlocking perceptions of self and world, word and image, in the literature and art of our modernity, from Rimbaud and Mallarmé, Gauguin and Van Gogh, through Surrealism and Cubism, to Camus and Sartre and beyond: the new novel and new wave film. Barthes, Bonnefoy, and contemporary French women writers.

INSTRUCTOR: M. Bishop
FORMAT: Seminar/lecture/tutorial

EXCLUSION: Former CTMP4310.06 and former CTMP2310.06

CTMP 2321.03A: The Question of the Other. Part A.

In recent years, the notion of alterity has been central to a number of disciplines such as feminist theory, postcolonial theory, anthropology, sociology, political science, and so forth. In the course "The Question of the Other," we will explore the assumptions that underlie various, often dissonant, instantiations of heterology. The course material has been designed to complement as well as problematize the ongoing debates around otherness.

First, using Freud as an example, we will look at the practice of conceptualizing woman as the other and examine the critique of this tradition in the writings of Simone de Beauvoir and contemporary feminists such as Luce Irigaray, Monique Wittig and Michèle Le Doeuff. Set against the background of Sartre's and Heidegger's existentialism, the analysis will point to the Western philosophy's habit of excluding sexual difference. Next, we will focus on the politics of identity and difference in the social and political context and examine the attempts to account for the other in Emmanuel Levinas' ethical philosophy, in the model of communicative reason developed by Jurgen Habermas and his feminist disciples such as Seyla Benhabib and Drucilla Cornell, and in the debate around multicultural democracy, as found in Charles Taylor's Multiculturalism. The readings in critical theory and philosophy will be supplemented by examples from literature, such as short stories by Charlotte Perkins Gilman, Albert Camus, Bharati Mukherjee, and Lesli Marmon Silko.

INSTRUCTOR: Peggy Heller. Dorota Glowacka, the instructor of CTMP2322.03B will participate in this course.
FORMAT: Seminar

CTMP 2322.03B: The Question of the Other. Part B.

The course draws upon the discussion of alterity developed in Question of the Other, Part A. It is recommended but not required that students complete Part A. The first section of the course investigates the dynamic of sameness and otherness stemming from Hegelian idealism. The dialectic model of intersubjectivity has been critically scrutinized by Hegel's 20th century commentators such as Theodore Adorno, Gilles Deleuze or Jacques Derrida. In the second section, we will focus on the phenomenology of the exotic other as reflected in critical theory, literature, and art. We will study two instances of the exoticization and corollary disenfranchisement of alterity in the 19th and 20th century: the figure of the eternal feminine and of the colonized other. Literary texts that will be considered include works by E. A. Poe, Charles Baudelaire, Kathy Acker, Nadine Gordimer, Bessie Head, Mahasveta Devi, and V.S. Naipaul.

INSTRUCTOR: Dorota Glowacka. Peggy Heller, the instructor of CSP2321.03A, will participate in this course.
FORMAT: Seminar

CTMP 3000.06: Science and Culture.

In the Twentieth Century, "Science" and "Culture" are often presented as a dichotomy. In this class we shall be examining that dichotomy, attempting to explode it by showing that science itself has a "culture" and that science is very much embedded in culture. We shall investigate disputes within sociology and philosophies of scientific method, debates around the public role of science, and the recent criticism of science and its place in society by the powerful critiques of feminism and post-modernism. A strong emphasis will be placed on case studies and seminar presentation.

INSTRUCTOR: G. McOuat

FORMAT: Lecture/tutorial

PREREQUISITE: Joint Honours students require CTMP 2000.06 or permission of instructor

CTMP 3101.03: The Crisis of the Critique of Reason.

There is a tendency, widespread in our day, to deny that we can know with certainty the conditions of any claim to knowledge, and as a result to doubt that we can say anything true about the world and ourselves. This class reconstructs the history of this critique of reason with a view to understanding the profound changes that have overtaken the social disciplines in the course of the past few decades. The class spans a couple of centuries and draws freely on writers from both continental and Anglo-American traditions. We discuss amongst other things the relationship between scepticism and truth, the practical character of human rationality, and the role of language in the formation of our scientific theories, our ethical and political thinking, and our aesthetic sensibilities. Special attention is given to the issue of creativity in language and criticism.

INSTRUCTOR: K. Kierans

FORMAT: Seminar

CTMP 3102.03: Tradition and Critique.

Nothing generates more controversy in our intellectual world than questions concerning the interpretation of history and culture. To what extent should interpretation be negative or critical? How are critical ideas contained in traditional practices and beliefs? In this class - a companion to CTMP 3101.03 - we explore the seemingly endless antagonism between tradition and critique. Starting from two opposed theories of interpretation - "deconstruction" (Derrida) and the "historicity of understanding" (Gadamer) - the class proceeds in a historically-oriented way to study, on the one hand, the philosophical traditions of idealism, Marxism, and hermeneutics and, on the other hand, psychoanalysis and literary criticism. We discuss amongst other things the distinction between myth and science, the notion of "progress" in history, and the sources of memory and understanding.

INSTRUCTOR: K. Kierans

FORMAT: Seminar

CTMP 3150.03: Nature and History

In the nineteenth and twentieth centuries the study of the natural world and historical thought have been closely linked. Participants in the seminar will read texts which helped to define ideas of history in the era after the enlightenment and consider how these ideas influenced, and were influenced by, developments in scientific thought. The seminar will consider how nature and history are related in idealism, historical materialism and the thinking of the evolutionists, and how this connection is rejected by Nietzsche, Freud and Foucault.

INSTRUCTORS: G. McOuat and H. Roper

FORMAT: Seminar

CTMP 3190.03: The Thought of Simone Weil.

Simone Weil (1909-1943) is one of the rare people of real genius in the first half of our century. She was born in Paris, and was a fellow student with Jean-Paul Sartre and Simone de Beauvoir. Their philosophy professor, Alain, described Weil as "far superior to the rest of her generation". For some time she was a teacher of philosophy, then in order to understand industrial working conditions she worked for a year on an assembly-line. Albert Camus was responsible for having several of her essays published. She fled the Nazi occupation of France, but died in London aged 34.

This seminar class will read and discuss a selection of her essays on a variety of topics, from the critique of Descartes in her *Lectures on Philosophy* to her assessment of Pythagorean metaphysics and contemporary Marxist political theory, and from writings on the history of mathematics and physics, to ones about human nature and political legitimacy in medieval France. In writings published posthumously there is rich testimony to her profound religious understanding, which we shall also consider.

INSTRUCTOR: S. Burns

FORMAT: Seminar/tutorial

EXCLUSION: CTMP 2110.03

CTMP 3203.03: Twentieth Century Continental Philosophies of Nature and Science.

For much of the Twentieth Century, our images of nature and science have been managed by the Anglo-American tradition of empiricism and analytic philosophy. Indeed that philosophy has provided us with a powerful understanding of the internal nature of knowledge and the scientific world. Yet, there remains a powerful tradition living wholly outside that heritage. Continental philosophy of science has stressed the relation between science as abstract knowledge and the world of everyday life. The focus has been upon the notion of "critique". This senior seminar course will discuss three interrelated schools of continental philosophy of nature and science, their origins in and critiques of phenomenology and their coming to grip with the historical nature of knowledge and reason.

INSTRUCTOR: G. McOuat

FORMAT: Seminar

CTMP 3315.03: Spiritual Discourse in Contemporary France (Instructor: J. Brown).

From the Middle Ages until the present time French literature has been deeply marked by the spiritual quest whether the latter take the form of romance, poetry, theatre, oration, essay, novel or meditation. In the 20th century especially, literature endeavors to explore the great questions of humanity — life, death, meaning, ethics — using a variety of literary forms and genres in an effort to grope and come to terms with what the Existentialists called the absurdity of life. The post WW II era has witnessed a 'crisis in poetry and language' of an enormous magnitude and a similar 'deconstruction' of other forms of discourse, yet during this same period society at large has turned and opened to the emergence of new spiritualities in France: contemplative practices within Judaism and Christianity, Tibetan and Zen Buddhism and Advaita Vedanta among others. In this course the nature and form of spiritual discourse will be examined as it evolves in France from the end of the 19th century to the end of the 20th century with special emphasis on emergent and/or resurgent spiritualities in what is generally named the New Age of Spiritual Awakening: Shambhala and Enlightened Society, Engaged Buddhism at Plum Village, Advaita or non-dualism at Grasse.

INSTRUCTOR: J. Brown

FORMAT: Seminar

CTMP 3321.03A: Between Story and Memory: Representations of the Holocaust. Part A: Bearing Witness.

As this generation is witnessing the transformation of Holocaust memory into history, the imperative to "never forget" has acquired new urgency. Can we prevent the dissolution of memory in the medium of representation? Does the horror of the Holocaust transcend the morally indifferent narrative practices? Is there a privileged genre of discourse that could do justice to suffering? In this course, we will focus on various, often disparate, modes of talking about the unspeakable and explore the ethical implications of the writer's or film-maker's effort to convert it into a story.

In Part A, we will read the "classics" of Holocaust literature by Elie Wiesel, Primo Levi, Tadeusz Borowski, and Paul Celan, less known works by Isabella Leitner, Ida Fink, and Nelly Sachs, as well as Holocaust diaries such as Adam Czerniakow's, Dawid Rubinowicz's or Ann Frank's. We will assess the truth claim of eye-witness accounts and consider the instances of heroizing or sentimentalizing

the horror. We will also examine the effort of prominent contemporary thinkers, both Jewish and Christian, to accommodate the inexpressible in philosophy.

The course material will include films Korczak and Night and Fog, and other video-taped material. Guest speakers will be invited for lectures, recollection, and discussion.

INSTRUCTOR: D. Glowacka

FORMAT: Seminar

EXCLUSION: Former CTMP3320.03 and former CTMP3030.03

CTMP 3322.03B: Between Story and Memory: Representations of the Holocaust. Part B: Remembrance.

It is recommended that students take "Between Story and Memory: Representations of the Holocaust," Part A. Basic knowledge of Holocaust facts and familiarity with some of the literature is required.

Part B focuses on the question of how the post-war generations testify to what has been handed down to them in the form of stories. While the horror is receding into the past, is it possible to carry on the labour of anamnesis and collective mourning? Moreover, are only some forms of remembering true and ethical? We will critically examine diverse attempts to perpetuate memory in literature, as in Benjamin Wilkomirski's *Fragments*, film, in Claude Lanzmann's *Shoah*, and art, on the example of Holocaust monuments. In the texts such as Art Spiegelman's *Maus* and Carl Friedman's *Nightfather* or the documentary *Dark Lullabies*, we will witness the struggle of survivors' children to reckon with the onus of their parents' past.

With the recent proliferation of the works exploring the Holocaust themes, there is a danger of commercialization and erasure of the Holocaust as the pivotal historical referent. Finally, considering that the deniers of the Holocaust are still gaining ground (viz. Ernst Zundel affair in Canada), we will ask whether young people today should view the remembrance of the Holocaust as a task.

As in Part A, the course material will include films and other video-taped material and guest speakers will be invited for lectures, recollection, and discussion.

INSTRUCTOR: D. Glowacka

FORMAT: Seminar

EXCLUSION: Former CTMP3320.03 and former CTMP3030.03

CTMP 3350.03: Postmodern Strategies in Literature by Women.

In the introduction to *Anti-Aesthetics*, Hal Foster proposes the term "postmodernism of resistance" to speak of the kind of postmodernism that moves beyond the dismantling of the tradition and insists on the need to effect a meaningful change in the status quo. The course *Postmodern strategies in literature by women* investigates how recent literature by women deploys postmodern procedures such as parody of traditional texts, self-reflective disruption of narrative continuity, fragmentation of the totality of a literary work and the blurring of the boundary between fact and fiction. The postmodern canon has provided women authors with the tools to scrutinize the way in which female subjectivity has been constructed by male-oriented processes of meaning-production. The critique of the employment of the feminine in the texts written by men and the aesthetic subversion of the phallogocentric politics of representation have resulted in a counterpractice of constructing an affirmative female identity, outside the dominant, patriarchal framework.

INSTRUCTOR: D. Glowacka

FORMAT: Seminar

CROSS-LISTING: WOST 3350.03

CTMP 3510.03: 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 and director.

CTMP 3511.03: Independent Readings In Contemporary Studies.

See class description above.

FORMAT: Individual instruction

PREREQUISITE: Honours registration in Contemporary Studies or permission of the instructor and director.

CTMP 3515.06: Independent Readings In Contemporary Studies.

See class description above.

FORMAT: Individual instruction

PREREQUISITE: Honours registration in Contemporary Studies or permission of the instructor and director

CTMP 4000.06: The Deconstruction of the Tradition In the 20th Century.

Through the analysis of selected philosophical and literary works, the class traces the unravelling of the Western tradition and its fundamental concepts, in order to explore the possibility of a new paradigm arising at the limits of ethics and aesthetics.

INSTRUCTOR: D. Glowacka

FORMAT: Lecture/tutorial

PREREQUISITE: CTMP 2000.06 and CTMP 3000.06 or permission of an instructor

CTMP 4100.03: Moderns and Anti-moderns.

Modernity not fully present and tradition not really past make a contradiction of contemporary culture. In this class students explore the theoretical and practical challenges presented by such a contradictory state. Inspired by radically opposed interpretations of our condition, the class assumes that the modern preoccupation with the "future" and the traditional regard for the "past" are equally relevant to theorists of contemporary culture. Students are encouraged to read and write, question and debate, and ultimately judge whether or how the modern experience of time and memory can be transformed to bring people to terms with their history. The readings — varied and diverse and richly cross-disciplinary — vary from year to year but give students the opportunity to explore one or two authors in considerable depth.

INSTRUCTOR: K. Kierans

FORMAT: Seminar

CTMP 4115.06: Language and Politics: The Linguistic Turn In Contemporary Political Thought.

The dominance of an individualist liberalism in Anglo-American political thought has recently come to be challenged by a number of communitarian political thinkers (e.g. Charles Taylor, Alisdair MacIntyre and Michael Sandel). This class seeks to elucidate the sources and development of communitarian political thought by considering its grounding in twentieth century philosophy of language and its relation to developments in continental political philosophy.

INSTRUCTOR: N. Robertson

FORMAT: Seminar

CTMP 4120.06: The Critique of Culture and the Fate of Modernity In 20th-century French Thought.

This class explores some of the key figures and movements in French intellectual life in this century. The class traces the evolution of French thought from the revolutionary humanism of the 1930s to the nihilism and scepticism dominant since the 1960s. The class deals in turn with the philosophy of the early French Hegelians, Sartre, Merleau-Ponty, the structuralists, Foucault, Derrida, Deleuze and Lyotard. Certain literary and artistic works are also considered.

The effort throughout is to relate the philosophical history of the period to political and cultural developments which have helped to shape French intellectual life.

INSTRUCTOR: K. Kierans

FORMAT: Lecture/tutorial

CTMP 4200.03: Philosophies of Technology I: The Questions Concerning Technology.

What does it mean to live in a "technological society"? In a certain sense, technology forms the very ground of what it means to be "modern". We moderns are technological beings. This course will explore the history, structure and associated problems of our coming to be technological, beginning with technical arts and instrumental reasoning of Enlightenment and industrial ideology. Post-Enlightenment critiques polarising around the place of "machine" and alienation in Karl Marx in the "question concerning technology" in Martin Heidegger will then be examined, leading up to the present state of technological discourse. In each case, we shall mark the importance of contextualising the debate by examining the actual historical evolution of technology. Weekly lectures will be devoted to presenting a social and historical background to the development of modern technologies whilst student-led seminars will focus on the reading of primary texts in the field.

INSTRUCTOR: G. McOuat

FORMAT: Seminar/lecture

CTMP 4201.03: Philosophies of Technology II: Technology and the Lifeworld.

This topical seminar course will explore in detail the implications of powerful contemporary debates concerning the meaning and place of technology. What do we mean by technology? Can there be a philosophy of technology? What are the political and cultural ramifications of going technological? Topics will include: technological determinism in history, feminist critiques, technology and development, the meaning of expertise, technology, art and the "lifeworld", social-construction vs. actor-network theory, Donna Haraway's concept of cyborg culture and the "modern technological sublime". The course will be conducted in seminar format with particular emphasis placed on the elucidation of historical and contemporary case-studies. Whenever possible, guest lecturers from the "real world" of technology will be invited to participate in class.

INSTRUCTOR: G. McOuat

FORMAT: Seminar/lecture

CTMP 4301.03: Freud, Lacan and the Critique of Psychoanalysis

Is psychoanalysis a medical practice, a method of interpretation, or an account of the social symbolic? The modern scepticism about consciousness and conscious life is most thoroughly voiced in psychoanalytic thought as first developed by Freud and pursued in the work of Jacques Lacan. This course will consider the question of the modern psyche, the nature of symbolic practices in art and literature, and the construction of libidinal economies in society. The central question of the course will concern the way in which the individual subject is incorporated in symbolic practices. The recent attack on Freud and Freudian methodologies will also be considered.

INSTRUCTOR: E. Edwards

FORMAT: Seminar

CTMP 4302.03: Recent French Feminist Theory

This class will concentrate on some of feminism's most challenging voices, those that have emerged from France in this century: Beauvoir, Kristeva, Cixous and Irigaray. The class will attempt to illuminate the intellectual background against which these women write, particularly in the areas of linguistic and anthropological structuralism, and in psychoanalytic theory. The class will be organized in part by the historical evolution of feminist thought, in part by the consideration of central feminist concerns.

INSTRUCTOR: E. Edwards

FORMAT: Lecture/tutorial

EXCLUSION: Former CTMP 2030.06 and 4300.06

CROSS-LISTING: WOST 4400.03

CTMP 4500.06: 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: Staff

FORMAT: Seminar (two or three hours)

PREREQUISITE: Honours registration in Contemporary Studies or permission of the instructor

CTMP 4510.03: 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 and director

CTMP 4511.03: Independent Readings In Contemporary Studies.

See class description above.

FORMAT: Individual instruction

PREREQUISITE: Honours registration in Contemporary Studies or permission of the instructor and director

CTMP 4515.06: Independent Readings In Contemporary Studies.

See class description above.

FORMAT: Individual instruction

PREREQUISITE: Honours registration in Contemporary Studies or permission of the instructor and director

Co-operative Education in Science

Location: Student Union Building, Fourth Floor
6136 University Avenue
Halifax, NS B3H 4J2

Telephone: (902) 494-2044

Fax: (902) 494-1984

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Academic Director

Lewis, M.R., BS, MS (UMd), PhD (Dal)

Programme Manager

Cottingham, C.R., BScAgr (UBC), PAG

Placement Officers

Baker, P.L., BCom Co-Op (MUN)
Little, A.J., BSc (MSVU), BEEd (SMU)

Academic Advisors

Cross, M., Economics (494-6897)
Field, C.A., Statistics (494-3339)
Grossert, J.S., Chemistry (494-3314)
Hall, J.M., Earth Sciences (494-6510)
Keast, P., Mathematics (494-7036)
O'Halloran, M.J., Marine Biology (494-2136)
Palmer, F.B. St.C., Biochemistry (494-2570)
Stroink, G., Physics (494-7062)
Sedgwick, A., Computer Science (494-2882)

I. Co-operative Education Programmes

Co-operative Education is a programme where academic study is combined with career related work experience. Students alternate four work terms with academic study terms and graduate with a Bachelor of Science Co-op. A workterm is a period of study conducted in an employment environment and is offered as a class listing within each academic discipline for registered science co-operative education students only. Science Co-operative Education programmes are available in Biochemistry, Chemistry, Computer Science, Earth Sciences, Economics, Marine Biology, Mathematics, Physics and Statistics. Students may choose a combined Honours or Advanced double Major where only one of the disciplines is a recognized co-operative education programme. Students may also choose a Bachelor of Science, Minor in Business with a Science Co-op option or Bachelor of Journalism, Combined Honours Science with a Science Co-op option.

Students who are qualified begin their first work term in January or May of Year II. The workterms are paid employment related to the field of study and are of 13 to 16 weeks duration. The programme includes four workterms and a minimum of eight academic terms comprising 20 academic credits. The Co-operative Education degree programme normally takes between four and a third and five years, depending upon the field of study chosen.

Students in co-operative education programmes must plan their academic course load carefully under the guidance of the departmental academic advisor. Co-op students have limited opportunity to take 'R' classes and the choice of classes in the Summer academic term may be limited. It is important that students realize that successful completion of the work terms is an integral part of the course of study.

A. Eligibility

Students must be eligible to work in Canada and demonstrate sufficient academic potential (B average or better, consult departmental listings). Permission of the academic department is required for entry. Applications must be received by the academic department on the last business day on or before September 1st of the desired academic year of entry into the co-op programme. Some departments have earlier deadlines. With the permission of the academic department, some students may be admitted on a probationary basis pending an improvement in their grades. Co-op students whose grades drop below a B average (3.00 GPA) overall will be required to withdraw from the co-op programme. Academic departments may, at their discretion, allow a probationary period before the requirement to withdraw is enforced.

B. Introduction to Professional Practice, SCIE 8700.00

This class is a prerequisite to the first workterm; all co-operative education students are required to attend upon acceptance into the programme. A pass is required before students undertake the first workterm experience. The class provides students with preparation for their employment search and for the work place. More detailed information about the class may be found under the Science, Interdisciplinary section of the calendar.

C. Workterms

Although the Co-op Office has an outstanding placement record, it is ultimately the responsibility of the student to arrange their workterm. The co-operative education office serves to co-ordinate contacts between students and employers. During their workterm, the student is an employee in matters pertaining to the conditions of employment and is a student for the purpose of academic evaluation only. The university accepts no liability for the working environment of the student's placement. Students are remunerated according to employer policy and the labour laws of the province in which the workterm takes place. Students must be remunerated, unpaid workterms are not permitted. Upon placement the student must sign a learning agreement which acknowledges awareness of co-op regulations, their responsibility to register for the workterm, pay a workterm fee (consult the fees section of the calendar) and complete a workterm report. During the workterm the student normally receives a monitoring visit from the co-op staff or the academic advisor to ensure that the academic objectives of the workterm are being met.

Workterms must be a minimum of 13 weeks at 32.5 hours per week, or an equivalent combination of hours and weeks worked. Four workterms with a grade of pass are required for graduation with a Bachelor of Science Co-op.

D. Workterm Sequence

Workterms alternate with study terms in a fixed pattern for each programme. Any request for change of sequence must be approved by the departmental Academic Advisor and the Manager, Science Co-op. Requests must be received by the academic department 14 weeks before the next scheduled workterm i.e. before January 15, May 15, or September 15. Two consecutive workterms are possible with the permission of the Academic Advisor and the Manager, Science Co-op. Three consecutive workterms (or more) are not permitted.

Dept./Term	A	B	S	A	B	S	A	B	S	A	B	S	A	B
Marine Biology	1	2	-	3	4	w	5	w	6	w	7	w	8	-
Earth Science	1	2	-	3	4	w	5	6	w	w	7	w	8	-
Biochemistry	1	2	-	3	4	w	5	6	w	w	7	w	8	-
Mathematics	1	2	-	3	w	4	w	5	w	6	7	w	8	-
Statistics	1	2	-	3	w	4	w	5	w	6	7	w	8	-
Economics	1	2	-	3	w	4	w	5	w	6	7	w	8	-
Computing Sc.	1	2	-	3	w	4	w	5	w	6	7	w	8	-
Chemistry Opt. 1	1	2	3	4	w	5	6	7	w	w	8	w	9	-
Chemistry Opt. 2	1	2	3	4	w	5	w	6	w	7	8	w	9	-
Physics	1	2	-	3	w	-	w	4	w	5	6	w	7	8

E. Workterm Reports

At the end of each workterm, each student must submit an acceptable workterm report which is related to their area of employment or their field of study. Specific guidelines for writing this report and submission deadlines are available from the academic advisor. Satisfactory work reports are required for continuation and graduation in the co-operative education programme. Satisfactory performance in the work place is also expected and co-op employers submit an employer evaluation for students in the programme. The grade for the workterm is based upon the workterm report, consideration is also given to the employer and student evaluations of the workterm. Failure to complete the workterm requirements will result in the student being required to withdraw from the co-operative education programme and a failure mark for the workterm.

F. Fees

Co-operative education students are required to register for their workterm and pay a co-operative education fee regardless of whether the services of the placement office are used. This fee is due and payable even if the student withdraws, or is required to withdraw from the work placement once employment has begun. Students who are unable to obtain placement are not required to pay a co-operative education workterm fee for that term. Consult the Fees section of this calendar for complete details.

Costume Studies

See Theatre, pg. 305

Dalhousie Integrated Science Programme

SCIE 1500.30: The Dalhousie Integrated Science Programme (DISP)

DISP is a full-time, 5-credit, intensive first-year programme that attempts to integrate concepts and techniques across Biology, Chemistry, Computer Science, Mathematics, Physics, Earth Science, Statistics, and Psychology. Topics, problems, and issues are regularly discussed from a multidisciplinary perspective, by presenting relevant scientific knowledge from the different disciplines, and by examining the social and economic implications of technology. Relationships between the science disciplines are emphasized in the application of mathematical and statistical methods to questions in other sciences.

Focus is on developing scientific reasoning and methodology, oral and written communication, problem-solving, and team-work skills. Students learn through lab exercises, field trips, lectures, discussions, group work, and research projects. Through the year, each student works as part of a small, interdisciplinary team to research a topic of their choice. Approximately every other Friday in September and October the class takes integrated field trips. Instruction, practice, and feedback in scientific writing are provided across disciplines. This program satisfies the writing class requirement.

DISP is an alternative way for a serious science student to complete their first year of studies. Depending on what major or program a DISP graduate chooses to enter in second year, DISP provides the same pre-requisites as the following classes: Biology 1000.06, Chemistry 1011.03/1012.03 or 1041.03/1042.03, Mathematics 1000.03 & 1010.03, Physics 1100.06, Earth Science 1000.06, Statistics 1060.03, Psychology 1000.06, and a half-credit in Computer Science. Because students study the essential material from each of these classes throughout the year, the workload of a DISP student is heavier than the workload of a typical first year science major.

While challenging the students, this program eases their transitions from high school to university in a number of ways: The workload is evenly distributed throughout the year, with continual assessment through assignments, lab reports, field trip reports, essays, quizzes, integrated exams, oral presentations, and successive drafts of the research paper. Small class size (< 80) provides much opportunity for student-instructor interaction. Students have an extensive support network, including members of their work group and research group, and their faculty advisor and research supervisor.

DISP is ideal for students who are interested in pursuing an honours degree in any of the sciences, a double major in two sciences, a career in environmental science, an engineering profession, or one of the health professions. DISP is also a good choice for the student who wants a broad background in science or prefers to study science in a cooperative atmosphere. On their transcripts, students receive a single letter grade for the entire 5-credit program. A breakdown of marks is also provided for the purpose of transferring to professional programs, other universities, or for future reference.

Students wishing to enter this program normally must have a minimum Grade 12 or OAC average of 80%, with a minimum of 75% in Mathematics and English, and at least one grade 12 or OAC science class. It is recommended that DISP candidates be highly-motivated and have a strong interest in science. For further information, e-mail disp@is.dal.ca or contact Ms. Cheryl Stewart, Department of Economics at (902) 494-2026, Fax (902) 494-6917.

Earth Sciences

Location: Life Sciences Centre, Room 3006
Halifax, NS B3H 4J1
Telephone: (902) 494-2358
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Interim Dean

Ryall, P.J.C., BSc (Dal), MSc (Alta), PhD (Dal), Associate Professor (Earth Sciences)

Chair of Department

Reynolds, P.H.

Undergraduate Advisor

Muecke, G.K. (494-6569)

Co-op Co-ordinator

Hall, J.M. (494-6510)

Graduate Co-ordinator

Culshaw, N. (494-3501)

Professors Emeriti

Cooke, H.B.S., MSc, DSc (Witwatersrand)
Medioli, F.S., PhD (Parma)
Milligan, G.C., MSc (Dal), PhD (Harv)

Professors

Clarke, D.B., BSc, MA (Tor), PhD (Edin)
Gibling, M.R., BA (Oxon), PhD (Ottawa)
Hall, J.M., BSc (Wales), PhD, DIC (Lond)
Jamieson, R.A., BSc (Dal), PhD, (MUN)
Reynolds, P.H., BSc (Tor), PhD (UBC)
Robinson, P.T., BSc (Mich), PhD (Calif)
Scott, D.B., BSc (Washington), PhD (Dal)
Zentilli, M., BSc (Chile), PhD (Queen's)

Associate Professors

Culshaw, N., BA (Keele), PhD (Ottawa)
Godfrey-Smith, D.L., BA (Calgary), MA (SFU), PhD (SFU)
Muecke, G.K., BSc, MSc (Alta.), DPhil (Oxon)
Ryall, P.J.C., BSc (Dal), MSc (Alta), PhD (Dal)

Professor (Research)

Schenk, P.E., BSc (Western), MSc, PhD (Wisc)

Assistant Professor (Research)

Martel, A.T., PhD (Dal)

Senior Instructor

Wallace, P., BSc, MSc (McM)

Research Associate

Beaumont, C., PhD (major appointment in Oceanography Department)

Honorary Adjunct Professors

Barr, S., BSc (UNB), PhD (UBC), Acadia University
Boyd, R., BSc, PhD (Sydney), University of Newcastle
Calder, J., BSc (SMU), PhD (Dal), NS Dept. of Natural Resources
Coffin, K., BSc, MSc, PhD (Calgary), GSC Atlantic
Dostal, J., BSc (Charles), PhD (McM), St. Mary's University

Gayes, P., BSc (NYSB), MSc (Penn State), PhD (NY at Stony Brook), Coastal Carolina

Hacquebard, P.A., BSc, MSc (Leiden), PhD (Groningen), LLD (Dal)

Jansa, L., BSc, MSc (Masaryk), PhD (Charles), GSC Atlantic

Kalkreuth, W., Dip (Berlin), Institute of Sedimentary and Petroleum Geology

Miann, Henrietta, BSc, BEd (Saint Mary's), MSc (Western), PhD (Western), Saint Mary's

Melchin, M., MSc (Waterloo), PhD (Western), St. Francis Xavier University

Mudie, P.J., BSc (Cape Town), BSc (Leicester), PhD (Dal), GSC Atlantic

Murphy, J.B., BSc (Dublin), MSc (Acadia), PhD (McG), StFX

Pe-Piper, G., BSc (Athens), PhD (Cambridge), Saint Mary's

Piper, D.J.W., BA (Hons) (St Catharine's Col, Cantab), MA (Cantab), PhD (Darwin Col, Cantab), GSC Atlantic

Raeside, R., BSc (Aberdeen), MSc (Queen's), PhD (Calgary), Acadia

Salisbury, M.H., BSc (MIT), MSc, PhD (Wash), GSC Atlantic

Slea, R., BSc (Acadia), MSc, PhD (Dal), NS Dept of Natural Resources

van Wagoner, N., BA, BSc (Calif), PhD (Dal), Acadia

Waldron, J., BA (Camb.), PhD (Edin.), Saint Mary's

Williamson, M., BSc, MSc (Wales), PhD (Dal), GSC Atlantic

- EARTH 2400.03: Marine Geoscience, an evening class open to all with good grades in 1000.06 or 1040.03/1050.03
- EARTH 2410.03: Environmental and Resource Geology, an evening class, open to all with good grades in 1000.06 or 1040.03/1050.03
- EARTH 2420.03: Dinosaurs: Origin, Evolution and Extinction, open to all with good grades in 1000.06 or 1040.03/1050.03.

For engineering students and science students in other disciplines:

- BIOL 1000.06
- BIOL 2410.03/3410.03
- BIOL 2201.03/2202.03
- BIOL 2420.03
- CHEM 1000.06
- CHEM 2101.03/2102.03
- CHEM 3010.03
- CHEM 3020.03
- CHEM 4380.03
- ENGI 1000.06
- ENGI 2050.03
- ENGI 2102.03/2102.03
- ENGI 2110.03
- ENGI 3130.03
- MATH 1000.06
- MATH 2050.03
- MATH 3130.03
- MATH 4270.03
- MATH 4280.03
- MATH 4290.03
- PHYC 1000.06
- PHYC 2050.03
- PHYC 3130.03
- PHYC 4270.03
- PHYC 4280.03
- PHYC 4290.03

I. Introduction

Earth Science studies 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 and environmental 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, their understanding of the environment and develop their appreciation of science.

High School Preparation

Students in high school who plan a career in sciences involving the Earth, such as geology or geophysics, should have Nova Scotia Mathematics 441 (or equivalent), plus Chemistry and Physics. Note that only Mathematics is a prerequisite, but the others are strongly recommended. The student should aim to make up deficiencies in high school preparation in the first year at Dalhousie.

ii. Undergraduate Programmes

Students should consult the "Degree Requirements" section of this calendar for specific regulations.

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:

- EARTH 1040.03/1050.03: The Earth and Society, a class especially designed for students not intending to major in geology

A. 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. Note that some mandatory field trips may be held on Sundays.

B. Seminars

Department seminars are arranged during the term. Other specialized seminars are arranged on an ad hoc basis.

C. Professional Registration

Professional Registration of Geoscientists (geologists & geophysicists), usually in a joint Association with Engineers, is spreading across Canada. Registration is necessary to practice as a professional in Alberta, British Columbia, Newfoundland, Quebec and Northwest Territories. Negotiations are well under way in four other provinces. You should be aware that a programme which meets our degree requirements does not necessarily meet criteria for registration. Consult the Academic Advisor. Students should note that, in addition to Earth Science classes, most Registration boards require students to have taken first-year Chemistry, Calculus and Physics. The appropriate Dalhousie classes are: CHEM 1011.03/1012.03, MATH 1000.03 and 1010.03, and PHYC 1100.06.

D. 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. See "Degree Requirements" section for complete details. Dalhousie Integrated Science Programme (see separate entry in this calendar) is an appropriate preparation for entry into the second year of an Earth Sciences programme.

Departmental Requirements

1000 level

- EARTH 1000.06 OR 1040.03 and EARTH1001.03 OR SCIE 1500.30
- EARTH 1001.03 or SCIE 1500.30

2000 level

- EARTH 0010.00
- EARTH 2050.03
- EARTH 2101.03
- EARTH 2102.03
- EARTH 2110.03 (Prerequisite: EARTH 0010.00)
- EARTH 2203.03
- EARTH 2204.03

3000 level

- EARTH 0020.03
- EARTH 3010.03
- EARTH 3020.03
- EARTH 3140.03
- EARTH 3302.03
- EARTH 3303.03

4000 level

- EARTH 0030.00
- EARTH 4200.06
- EARTH 4351.03
- Plus other advanced Earth Science credits for a total of nine credits beyond the 1000 level.
- Honours Qualifying examination.

Other required classes

- COMP 1000.03 (PC section)
- MATH 1000.03
- MATH 1010.03
- Two of PHYC 1100.06, CHEM 1011.03/1012.03, BIOL 1000.06 or 2001.03 and 2002.03

Other departmental requirements

Two credits in a minor subject.

NOTE: PHYC 1100.06 and a Mathematics class are prerequisites for EARTH 2050.03, which fits best into Year II of the programme.

In second-year, students should take one class in two of Physics, Chemistry, Biology, Mathematics. Recommended classes are: BIOL 2001.03 and 2002.03, 3321.03; CHEM 2110.03, 2200.03; 2310.03, 2320.03; PHYC 2000.03, 2005.03, 2010.03, 2015.03, or 2220.03/2230.03; MATH 2000.06, 1060.03/1070.03, 2270.03.

Students in the geophysics stream will take EARTH 3130.03. This class has a field school, which is an integral part of the class. It is normally held in late April or early May.

To satisfy Regulation 11.5 concerning the Honours Qualifying Examination, a student will complete a thesis as EARTH 4200.06, followed by an oral examination, based on the general subject area of the thesis. This oral examination combines with EARTH 0030.00 then counts as the honours qualifying examination.

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 EARTH 4200.06, pay the fees, and graduate at the spring convocation of the next academic year.

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.

E. 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 fulfill 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.

Departmental Requirements

Same as for the regular Honours programme above in addition to the work described directly above. Note especially the regulations for work-terms given before the work-term listings.

F. 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.

G. 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:

Departmental Requirements

Year I

- CHEM 1011.03/1012.03
- EARTH 1000.06 OR 1040.03 and EARTH 1001.03 OR SCIE 1500.30
- MATH 1000.03/1010.03
- PHYC 1100.06
- Writing Requirement elective

Year II

- COMP 1000.03
- EARTH 0010.00
- EARTH 2101.03
- EARTH 2102.03
- EARTH 2203.03
- EARTH 2204.03
- EARTH 2110.03 (Prerequisite: EARTH 0010.00)
- OCEA 2850.06
- Social Science Elective

Year III

- EARTH 0020.03
- EARTH 3010.03
- EARTH 3301.03
- EARTH 3140.03
- EARTH 3400.03
- EARTH 3410.03
- EARTH 3303.03
- EARTH 3020.03
- EARTH 2050.03
- Elective

Year IV

- EARTH 4200.06
- EARTH 0030.00
- EARTH 4501.03
- EARTH 4351.03
- 1.5 credit from EARTH 4000-level classes (EARTH 4270.03/4280.03, 4290.03, 4350.03, 4501.03, 4502.03, 4503.03, 4510.03)
- 1-credit from Oceanography (OCEA 4110.03, 4120.03, 4130.03, 4150.03, 4280.03)

H. 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. Students must attend the field school normally taken at the beginning of second-year (ERTH 0010.00).

I. Combined Honours with Biology

Earth Sciences Honours Programme should be followed during Years I-III and students should take either a Biology class or EARTH 4501.03 or 4502.03 or 4503.03 in place of EARTH 3010.03/3020.03. Suggested Biology classes are 1000.06 or 2001.03 and 2002.03 in Year I; 2030.03 and 3030.03 and 2060.03 in Year II; 2001.03 and 2002.03 or 3321.03 or 3323.03 in Year III.

J. Combined Honours with Physics

Students should follow the Earth Sciences Honours Programme in years I to III, including EARTH 2050.03 and EARTH 3130.03, but should take a Physics class in place of EARTH 3010.03/3020.03. Suggested Physics classes are 1100.06 in Year I, 2000.03, 2005.03, 2010.03, 2015.03 in Year II, two of 3090.03, 3140.03 or 3000.03/3010.03 or 3200.03/3210.03 and 3160.03/3170.03 in Year III. MATH 2000.06 should also be taken in either Year II or III, and MATH 3110.03/3120.03 in Year III or IV.

K. 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 EARTH 3302.03/3303.03 and 2050.03/3130.03. Suggested Chemistry classes are 1010.06 in Year I, 2201.03/2101.03 and 2301.03/2302.03 or 2400.06 in Year II; any 3000 level in Year III.

L. Earth Systems Science

Students wishing to follow an interdisciplinary study of the Earth should consult the Earth Systems Science section of this calendar.

M. Advanced Major (20-credits)

Departmental Requirements

1000 level

- EARTH 1000.06 or 1040.03
- EARTH 1001.03 or SCIE 1500.30

2000 level

- EARTH 0010.00
- EARTH 2101.03
- EARTH 2102.03
- EARTH 2110.03 (Prerequisite: EARTH 0010.00)
- EARTH 2203.03
- EARTH 2204.03

3000 level

- EARTH 0020.03
- One half-credit in Earth Sciences above the 1000 level
- Three (3) additional credits in Earth Sciences beyond the 2000 level

Other required classes

- MATH 1000.03
- MATH 1010.03/1060.03
- One of PHYC 1100.06, CHEM 1011.03/1012.03, BIOL 1000.06 or BIOL 2001.03 and 2002.03

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.

Requirements for Professional Registration: see above.

N. Advanced Major Co-op (20 credit)

Departmental Requirements

Same as for the Advanced Major above plus the work described in the Co-op programme section previously stated.

O. Major in Earth Sciences (15 credit)

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. It does not meet requirements for Professional Registration.

Departmental Requirements

1000 level

- EARTH 1000.06 OR 1040.03 and EARTH 1001.03 OR SCIE 1500.30

2000 level

- EARTH 0010.00
- EARTH 2101.03
- EARTH 2102.03
- EARTH 2110.03 (Prerequisite: EARTH 0010.00)
- EARTH 2203.03
- EARTH 2204.03

3000 level

- EARTH 0020.03
- Two (2) additional Earth Sciences credits beyond the 2000 level.

ERTH 1000.06 or 1040.03/1001.03 must be passed with a grade of B- or better to continue in the programme.

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.

III. Classes Offered

NOTE: Not all classes are offered every year, please check the current timetable for current class offerings. Note also that some mandatory field trips may be held on Sundays. Check with Instructor.

ERTH 1000.06: 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 EARTH 1000.06 should consult the undergraduate advisor.

INSTRUCTOR: J. Hall

FORMAT: Lecture/field trip/lab

EXCLUSION: Credit will be given for only one of EARTH 1000.06, 1040.03/1050.03, or 1040.03/1001.03.

ERTH 1001.03: Beginning Geology.

This class is intended primarily for students intending to major in earth sciences. Lectures will cover 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.

INSTRUCTOR: J. Hall

FORMAT: Lecture/lab

PREREQUISITE: EARTH 1040.03

EXCLUSION: Credit will be given for only one of EARTH 1000.06, 1040.03/1050.03, or 1040.03/1001.03.

ERTH 1040.03/1050.03: The Earth and Society.

These classes are designed for non-Earth Sciences majors. Previous Mathematics, Physics, or Chemistry are not required. They do not include formal labs, but 1040.03 includes three field trips, and some assignments are done in a laboratory environment. There may be some variation in topics depending on instructor.

ERTH 1040.03 introduces basic concepts about the Earth and principles of Earth Science including those directly applicable to environmental science (applications mainly covered in 1050.03): the Earth as a planet, geological time, global change, stratigraphy, and surficial geology. Emphasis is also given to the main kinds of rocks (igneous, sedimentary and metamorphic), minerals, the folding and faulting of rocks inside the Earth, and surface processes such as development of landforms, glaciation, soils, rivers & floods, deserts and coastline development. Field trips to excellent exposures in Nova Scotia illustrate different basic rock types and the effects of deep and surface processes active in its geologic history. Students are taught to read the succession of past environments from the rock record.

ERTH 1050.03 begins with the unifying concepts of plate tectonics and then applies principles of Earth Science learned in 1040.03 to problems in environmental, resource geology and geological hazards, for example mineral and petroleum resources (including environmental problems associated with their recovery and use), waste disposal, the carbon cycle, history and causes of climate change, fossils and extinctions, coastal subsidence, volcanic and earthquake hazards, the catastrophic effects of meteorite impacts, etc. A large proportion of class time is spent on environmental applications of geology, including some special readings and discussion on current problems.

ERTH 1040.03 is a prerequisite for EARTH 1050.03. Students with good grades in EARTH 1040.0 may enter EARTH 1001.03.

INSTRUCTORS: D.I. Godfrey-Smith, J. Hall, P.J.C. Ryall, M. Zentilli

FORMAT: Lecture/Field Trips on 3 Sundays

EXCLUSION: Credit will be given for only one of EARTH 1000.06, 1040.03/1050.03, or 1040.03/1001.03

ERTH 0010.00: Field School.

The class provides seven days of concentrated instruction off campus in geological field methods. A wide variety of rock types are examined in the field using traverses, measured sections and outcrop maps. The class is held the week before classes begin in the fall term and should normally be taken by those enrolling in second-year level Earth Sciences classes EARTH 2101.03, 2102.03, 2110.03, 2203.03 or 2204.03. Although EARTH 0010.00 by itself is non-credit, it appears on transcripts and EARTH 0010.00 plus EARTH 0020.03 is a half credit.

INSTRUCTOR: P. Wallace

FORMAT: Off campus, 7-10 days

PREREQUISITE: EARTH 1000.06 or EARTH 1040.03/1001.03 or SCIE 1500.30.

ERTH 2001.03: Earth Materials Science I.

Materials from the Earth — including minerals, petroleum, water, and soil — form the basis of our industrial society and are vital to the Canadian economy. EARTH 2001/2002 is intended to introduce students to the origin, distribution, and chemical and physical properties of some important Earth materials. Lectures in the fall term focus on minerals as naturally occurring crystalline materials, and cover some important mineral resources including abundant metals such as iron and aluminum and geochemically scarce metals such as copper and gold. Labs include the identification of minerals in hand sample, elements of crystallography, and some important analytical techniques. The class may also include a weekend field trip and/or visits to analytical facilities at Dalhousie or DalTech. This class is a prerequisite for EARTH 2002.03 and most third-year Earth Sciences classes. Students who have not already taken CHEM 1010 or its equivalent are strongly encouraged to take this concurrently.

INSTRUCTOR: R.A. Jamieson

FORMAT: Lecture 3 hours/lab 3 hours/weekend field trip

PREREQUISITE: EARTH 1000.06 or EARTH 1040.03/1050.03;

Chemistry majors should consult the department.

ERTH 2002.03: Earth Materials Science II.

Lectures in the spring term deal with some non-metallic Earth materials that are important for their physical properties (building stone, gravel, sand) or chemical properties (fossil fuels, nuclear materials). Another major topic of discussion centres on two important inorganic Earth materials needed to support life, namely water and soil. We also consider the physical, chemical, and biological environmental impacts of resource exploitation in general. Laboratory work focuses on the principles and techniques of optical mineralogy, and also provides practical experience with some of the Earth materials listed above. This class is a prerequisite for most third-year Earth Sciences classes.

INSTRUCTOR: D.B. Clarke

FORMAT: Lecture 3 hours/lab 3 hours/field trip

PREREQUISITE: EARTH 2001.03

ERTH 2050.03: Principles of Geophysics I.

Geophysical methods are increasingly important in land- and sea-based geological studies. These studies range in scale from understanding the Earth's crust to investigating problems related to waste disposal sites. Understanding the principles of the various techniques (seismics, gravity, magnetics) their powers, and limitations, provides a foundation for later work. The geophysics field school normally conducted during the last week of April is an integral part of this class.

INSTRUCTOR: P.J.C. Ryall

FORMAT: Lecture 3 hours/ tutorial 2 hours

PREREQUISITE: First-year class in Mathematics and PHYC 1100.06

ERTH 2110.03: Field Methods.

This is intended as an introduction to field techniques useful to the practising geologist, particularly those concepts essential for the accurate field description and identification of rocks and the use and construction of geological maps. Computer techniques and elementary structural geology are also considered.

NOTE: Attendance at the Field School (ERTH 0010.00) is mandatory prior to attendance at this class.

INSTRUCTOR: N. Culshaw

FORMAT: Lecture 3 hours/ lab 3 hours/ field trips

PREREQUISITE: EARTH 1000.06 or EARTH 1040.03/ERTH 1001.03, EARTH 0010.00

ERTH 2203.03: Sediments and Sedimentary Rocks.

This class deals with physical and biological processes which generate modern siliclastic, 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. Gibling

FORMAT: Lecture 3 hours/lab 3 hours

PREREQUISITE: EARTH 1000.06 or EARTH 1040.03/ERTH 1001.03

ERTH 2204.03: Life Through Time.

This class serves two audiences: it is an introduction to paleontology and also a "general education" to introduce non-geology-specialists to past life. The class will deal with two dozen major events in the history of life. Topics include the origin of life, sex and nuclei, leaving the water, paleoclimate and diversity, reptiles and thermoregulation, the evolution of flight, why flowers are beautiful, the end of the dinosaurs, and evolving toward humans. Laboratory time will involve survey of animal phyla, exercises in paleoecology and paleogeography, and oral presentations by seminars and posters.

INSTRUCTOR: D. Scott

FORMAT: Lecture 3 hours/lab 3 hours

PREREQUISITE: EARTH 2203.03 or EARTH 1040.03/ BIOL 1000.06

ERTH 2400.03: Marine Geoscience.

The ocean basins make up nearly three quarters of the Earth's surface and are the loci of many active geologic processes. This class 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 and economic aspects of the marine environment. The class is designed to provide an introduction to the subject for non-earth sciences majors as well as for those who plan to take a degree in earth sciences, but it is not recommended for earth sciences honours students.

INSTRUCTOR: P. Reynolds

FORMAT: Lecture/lab 3 hours, one evening per week

PREREQUISITE: Any first-year class in earth sciences

ERTH 2410.03: 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 water plays in its various guises. This class is not recommended for earth sciences honours/major students who should take EARTH 3410.03.

INSTRUCTOR: P. Reynolds

FORMAT: Lecture/ lab 3 hours, one evening per week

PREREQUISITE: EARTH 1000.06 or EARTH 1040.03/1050.03 or 1001.03

ERTH 2420.03: Dinosaurs: Origin, Evolution and Extinction.

This class will consider the origin, evolution and extinction of the dinosaurs as a case-study of evolutionary processes. It will address such questions as: what were the dinosaurs? Cold-blooded reptiles, or warm-blooded, mammal-like parents? Why did some of them grow so large and heavy? Are the birds their descendants? In attempting to answer these apparently simple questions we will also investigate the sophisticated methods for gathering sufficient evidence from bones to reconstruct not only the physiology of these surprisingly modern organisms but also rather intangible characteristics such as behaviour.

INSTRUCTOR: F.S. Mediolli

FORMAT: Lecture 3 hours

PREREQUISITE: EARTH 1040.03/1050.03 or 1040.03/1001.03 or 1000.06

ERTH 2430.03: Quaternary Geochronology.

A review of a range of dating methods, including those that rely on interval counting, isotope ratios, chemical changes, and radioactive decay. Applications across all disciplines, including geology, archaeology, paleo-anthropology, biology and the environmental sciences, will be highlighted. Methods pertaining to the last three million years will be emphasized, but those relevant to the Pliocene and earlier periods will also be reviewed. Case studies relating to human evolution and cultural development, as well as the study of Quaternary sedimentary geology and past climate change will be highlighted.

INSTRUCTOR: D.I. Godfrey-Smith

PREREQUISITE: EARTH 1040.03/1050.03 or 1001.03 or 1000.06, or permission of the instructor AND completion of a 1000-level mathematics class.

ERTH 0020.03: Computing Camp.

This class is required for major, advanced major, and honours programmes and it is designed to provide the computing skills necessary to meet today's challenges. These skills will be learned through a field-mapping project using computers to manipulate data and prepare geologic maps. The class will be held the week before classes begin in the third year of a programme.

INSTRUCTOR: P. Wallace

FORMAT: Off Campus, 10 days

PREREQUISITES: EARTH 0010.00, 2101.03, 2110.03, 2102.03, 2203.03, 2204.03

ERTH 3010.03: 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. Practical work consists of three field trips and following laboratory investigations.

INSTRUCTOR: D.B. Clarke

FORMAT: Lecture 3 hours/ lab 3 hours/field trips

PREREQUISITE: EARTH 2101.03/2102.03 and CHEM 1010.06

ERTH 3020.03: 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. The relationship of metamorphism to other geological processes is considered. In the labs, microscopic mineralogy and texture are used to decipher the metamorphic history of rocks.

INSTRUCTOR: R.A. Jamieson

FORMAT: Lecture 3 hours/ lab 3 hours

PREREQUISITE: EARTH 2101.03/2102.03, EARTH 3010.03

ERTH 3130.03: Principles of Geophysics II.

This class is designed to follow EARTH 2050.03 and contains complementary material. Topics include: electrical properties of rocks; resistivity, self-potential and induced polarization; electromagnetics; radioactivity; geophysical well logging; integrated geophysical problems. Examples are taken from the mining industry, and also from the environmental and geotechnical fields.

INSTRUCTOR: P.H. Reynolds

FORMAT: Lecture 3 hours

PREREQUISITE: EARTH 2050.03

ERTH 3140.03: 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 geologist, and their interpretation.

INSTRUCTOR: N. Culshaw

FORMAT: Lecture 3 hours/ lab 3 hours

PREREQUISITE: EARTH 2101.03/2102.03, EARTH 2110.03, EARTH 2203.03/2204.03

ERTH 3302.03: Quaternary Sedimentary Environments.

The class 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. Scott

FORMAT: Lecture 3 hours/lab 3 hours

PREREQUISITE: EARTH 2203.03/ERTH 2204.03

ERTH 3303.03: Stratigraphy.

Stratigraphy is the backbone of the geological sciences; it is the interaction of sedimentology, paleontology, petrology, and structural geology to reconstruct Earth history. Subtopics include litho-, bio-, and chronostratigraphy as well as event, seismic, and sequence stratigraphy. We shall survey the fields of eustasy, isostasy and the geologic framework of sediment accumulation. The class concludes with a summary of geologic history. Laboratories include exercises, some of which involve the computer, and seminars.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours/lab 3 hours

PREREQUISITE: EARTH 3302.03

ERTH 3400.03: Fundamentals of Hydrogeology.

The availability of clean water is absolutely essential for the development and maintenance of modern societies. This class 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: J. Hall

FORMAT: Lecture 3 hours/ lab 3 hours

PREREQUISITE: EARTH 2101.03, 2102.03, 2203.03

ERTH 3402.03: 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, lab/tutorial 2 hours

PREREQUISITE: EARTH 3400.03

ERTH 3410.03: Enhanced Environmental Geology.

The topics treated in this class are similar to those of EARTH 2410.03. However, the class is designed specifically for students with a strong background in geology; equivalent to that of a third-year Earth Science 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 class. For example, participants have researched the environmental implications associated with the various geologic options that have been considered for the permanent storage of high-level nuclear waste. Laboratory exercises emphasize the application of geographic information systems (GIS) to environmental decision-making processes.

INSTRUCTOR: G.K. Muecke

FORMAT: Lecture 3 hours/ lab 3 hours

PREREQUISITE: EARTH 3400.03, 2101.03/2102.03, 3500.03

ERTH 3420.03: Geochemistry of Aquatic Environments.

Given the abundance of water at the earth's surface and the wide use both humans and other organisms make of aqueous environments, it becomes imperative for environmentally-oriented scientists to understand the chemistry of natural bodies of water. In particular, we need to comprehend the processes that lead to the observed composition of groundwaters, lakes, rivers and oceans. We also need to be aware of how man's activities can alter these natural systems. Water is also an agent for geologic and environmental change, both on short and long time-scales. Earth and environmental scientists should have an appreciation of these processes (sources, sinks and transport mechanisms) and the resulting geological cycles.

This class is an introduction to the governing principles and processes of aquatic geochemistry. Specific topics will include physical chemistry of natural waters, kinetics (mechanisms & rates) of geochemical reactions, the hydrologic cycle, the dissolved carbonate system and pH controls, redox reactions and the influence of life, rainwater and acid rain, weathering and the formation of soils, mineral-solution equilibria, controls on the composition of rivers, lakes and oceans, sediments and their after-burial changes, and the global cycles of carbon, nitrogen, and sulfur. Students will be taught to approach problems quantitatively through the principles of mass action (K_h-pH and activity-activity diagrams) and of mass balance (box models and conservation equations).

INSTRUCTOR: B.P. Boudreau

FORMAT: Lecture 3 hours

CROSS-LISTING: OCEA 3420.03

PREREQUISITES: CHEM 1011.03/1012.03 or equivalent; and EARTH 1000.06

ERTH 3500.03: Geoscience Information Management.

Earth science professionals need to be conversant with microcomputer technologies that involve the acquisition, storage, processing, and analysis of digital geoscience data. In this class we consider the manipulation of numerical, text-based, spatially referenced (cartographic), and image-based (aerial photos, satellite imagery) data sets. The theory and applications of relational databases, global positioning systems (GPS), and both raster and vector geographic information systems (GIS) in the geosciences will be discussed. The integration of systems (ex. GIS with GPS and databases) will also be investigated. Laboratory projects based on geological and environmental problems and data sets form an integral part of the class. Participants are expected to have a basic familiarity with the MS-DOS and WINDOWS operating systems.

INSTRUCTOR: G. K. Muecke

FORMAT: Lecture 3 hours/lab 3 hours

PREREQUISITE: EARTH 1000.06 or 1040.03/1050.03, 2110.03, 2101.03, 2102.03, 2203.03

ERTH 0030.00A: 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. Locations visited will vary from year to year; frequently these are overseas. It appears on transcripts and is compulsory for all Honours students. Attendance and completion of this class will be part of the 21st credit required for the honours degree.

INSTRUCTOR: Staff

FORMAT: Off campus, 7 - 14 days

ERTH 4100.06: Research Project.

See class description for EARTH 4200.06.

INSTRUCTOR: M. Gibling

FORMAT: Lecture 3 hours

ERTH 4151.03: 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 oral presentations.

INSTRUCTOR: M. Zentilli

FORMAT: Lecture 3 hours/ lab 3 hours

PREREQUISITE: EARTH 2101.03, 2102.03 and 2110.03

ERTH 4152.03: 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.

INSTRUCTOR: M. Gibling

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITE: EARTH 3302.03/3303.03

ERTH 4200.06: Honours Thesis.

This class deals with many aspects of written and oral communication of scientific and technical material. In particular, it covers the scientific method, 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.

INSTRUCTOR: M. Gibling (Co-ordinator)

FORMAT: Lecture 3 hours

ERTH 4270.03: Applied Geophysics.

The application of geophysical methods to petroleum and mineral exploration as introduced in 2050.03 and 3130.03 is here treated at a more advanced level with an emphasis on seismic techniques.

Assignments involve the student in interpretation of industry geophysical data and modelling on workstations.

INSTRUCTOR: P. Ryall

FORMAT: Lecture 3 hours/ lab

PREREQUISITE: EARTH 2050.03, EARTH 3130.03 or instructor's consent

CROSS-LISTING: EARTH 5270.03

ERTH 4280.03: 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.

INSTRUCTOR: K. Loudon

FORMAT: Lecture 3 hours/ lab

PREREQUISITE: EARTH 2050.03, EARTH 3130.03, EARTH 4270.03 or instructor's consent

CROSS-LISTING: EARTH 5280.03, OCEA 4350.03/5350.03

ERTH 4350.03: Tectonics.

This class 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

PREREQUISITE: All third-year Geology core classes

ERTH 4351.03: Canadian Regional Tectonics.

This class is a required class for Earth Sciences Honours students. It is intended to synthesize the various aspects of geology treated in more specialized classes 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. Culshaw

FORMAT: Lecture 3 hours

CROSS-LISTING: EARTH 5351.03

ERTH 4380.03: Advanced Geochemistry.

This class begins with a review of the Periodic Table and a discussion of nomenclature, properties, and classification of the elements. The next section on Cosmochemistry covers the origin and distribution of elements including the transuranic superheavies, condensation sequences, origin of solar system and planets, bulk composition and differentiation of the Earth, and origin of the Moon. A major section on Isotope Geochemistry covers the systematics and examples of radiogenic (Rb-Sr, Sm-Nd, U-Pb) and stable (H,C,O,S) isotopic systems. Two other sections cover Geochemical Cycles in the endogenic environment (transfer of elements in the interior of the Earth, and litho-geochemistry in petrogenetic studies of igneous, sedimentary, and metamorphic

rocks), and exogenic environments (lithosphere, atmosphere, biosphere, hydrosphere). A final section on Applied Geochemistry covers the principles and examples of forensic (natural and criminal), exploration, and environmental geochemistry.

INSTRUCTOR: D.B. Clarke

PREREQUISITE: EARTH 3010.03, 3020.03

CROSS-LISTING: EARTH 5380.03

ERTH 4400.03: 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. The use of metamorphic data in tectonic analysis is considered at length. Laboratory projects and special topics are chosen to suit the students' interests. This class is offered subject to interest.

INSTRUCTOR: R.A. Jamieson

FORMAT: Lecture 3 hours

PREREQUISITE: EARTH 3010.03, EARTH 3020.03

CROSS-LISTING: EARTH 5400.03

ERTH 4502.03: Micropaleontology and Global Change.

This class provides a systematic study of major groups of microfossils (principally foraminifera, ostracoda 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/ lab 3 hours

PREREQUISITE: EARTH 3302.03/3303.03

CROSS-LISTING: EARTH 5502.03

ERTH 4503.03: Carbonate and Evaporite Petrology.

This class 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: Staff

FORMAT: Lecture 3 hours/ lab/seminar 3 hours

PREREQUISITE: EARTH 3302.03

ERTH 4510.03/4511.03: 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. The course should be supervised by a regular faculty member and the course content and marking scheme must be submitted to and approved by the chairperson in the first week of classes. Further guidelines for directed reading courses are available from the undergraduate advisor or the Earth Sciences office.

INSTRUCTOR: Staff

FORMAT: As required

PREREQUISITE: Permission of Department

ERTH 4520.03: GIS Applications to Environmental and Geological Sciences.

Geographic information systems (GIS) provide a rich set of new tools to the geologist and environmental scientist, not only to solve conventional problems, but also to explore questions not readily answered by other means. This class builds on the fundamentals of GIS taught in EARTH 3500.03 to explore analytical tools that aid in decision-making processes encountered in mineral exploration, hydrogeology, site selection, environmental assessment, and global change analysis. The class concentrates on case studies and problem solving, including those requiring multi-criteria and multi-objective decision making processes.

INSTRUCTOR: G.K. Muecke

PREREQUISITE: EARTH 3500.03, STAT 1060.03

CROSS-LISTING: 5520.03

SCIE 3000.06: 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". Check with undergraduate advisor for the status of this class.

SCIE 8700.00: Co-op Seminar

IV. Co-op Workterms

Each workterm is a prerequisite of the succeeding workterm. Workterm registration requires a signature from the Science Co-op Co-ordinator.

ERTH 8891.00: Co-op Work-Term I.

ERTH 8892.00: Co-op Work-Term II.

ERTH 8893.00: Co-op Work-Term III.

ERTH 8894.00: Co-op Work-Term IV.

Earth Systems Science

The Earth is the only body in the universe known to support life. It has evolved over the past five billion years. The major components are the lithosphere, hydrosphere, atmosphere and biosphere. A change in one component of the Earth Systems affects the others.

Because of the complexity of the Earth system, the major components have been studied separately: the lithosphere by geologists, the hydrosphere by oceanographers, the atmosphere by meteorologists and the biosphere by biologists. These disciplines have been underpinned by the fundamental sciences of chemistry and physics as well as mathematics. This separation has enabled the development of knowledge, but sometimes at cost to the integration of that knowledge in understanding the Earth system as a whole. It is now time to integrate these separated packages of knowledge into Earth Systems Science. The goal of Earth Systems Science, according to the NASA Advisory Council, is "To obtain a scientific understanding of the entire Earth System on a global scale by describing how its component parts and their interactions have evolved, how they function, and how they may be expected to evolve on all timescales".

Recent realization of the impact of human activities on the Earth system has spawned a new science, environmental science, which requires an understanding of the Earth system and the factors affecting human behaviour. Environmental scientists must understand the functioning of the Earth system as well as the functioning of human societies in order that change brought about by human activities can be predicted, and if necessary avoided or ameliorated. This understanding will become the cornerstone of the development of an environmentally sustainable society. The challenge, again according to NASA, is "To develop the capability to predict those changes that will occur in the next decade to century, both naturally and in response to human activity."

This programme will meet a variety of career interests including those related to the environment.

I. Degree Programmes

The programme in Earth Systems Science is taken as an area of emphasis in two subjects (chosen from biology, chemistry, earth sciences, oceanography and physics) towards an Advanced Double Major, Combined Honours or Unconcentrated Honours. Each student's programme will be devised within the following general requirements in consultation with a faculty advisor. The Earth Systems Science classes will be selected from a recommended list (available from Dean's Office - Faculty of Science) of classes from Biology, Chemistry, Earth Sciences, Oceanography, and Physics. When a student completes this programme it will be noted on the transcript, e.g. Advanced Double Major in Biology and Chemistry: Earth Systems Science.

Departmental Advisors are: B. Freedman - Biology, R.D. Guy - Chemistry, G. Muecke - Earth Sciences.

Year I

- Dalhousie Integrated Science Programme (formerly Science Foundation Year) or equivalent background in Biology, Chemistry, Earth Sciences, Mathematics, and Physics.

Year II

- Arts/Humanities elective
- Maths/Stats or Computer Science at second-year level
- One credit in Earth Sciences and one each in two of Biology, Chemistry and Physics.

Year III

- Two credits each in two of the three subjects chosen in IIc or four from the relevant science disciplines;
- An interdisciplinary Earth Systems class (OCEA 3000.03: The Atmosphere; OCEA 3170.03: The Oceans).

Year IV

- Two credits in one of the subjects taken in IIIa plus two other credits from Biology, Chemistry, Earth Sciences and Physics (one of these would be the honours thesis), or four from the relevant science disciplines;
- An interdisciplinary Earth Systems class (consult department).

Economics

Location: 6206, 6214 and 6220 University Avenue
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Administrative Offices:
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Telephone: (902) 494-2026

Interim Dean

Ryall, P.J.C., BSc (Dal), MSc (Alta), PhD (Dal), Associate Professor
(Earth Sciences)
Telephone: (902) 494-3540

Chairperson of Department

Lesser, B.

Faculty Advisors

Bradfield, M., Undergraduate Coordinator (494-6989)
Dasgupta, S., Graduate Coordinator (494-6868)
McAllister, I., MDE Coordinator (494-6993)

Professors Emeriti

Cornwall, J.L., BA (Iowa), MSc (Lond), PhD (Harvard), FRSC
Konczacki, Z.A., BSc (Lond), BEconHons (Natal), PhD (Lond)
Sinclair, A., BA (Dal), MA, BPhil (Oxon), PhD (Harvard)

Professors

Bradfield, F.M., BCom (McM), PhD (Brown)
Dasgupta, S., BA (Calcutta), MA (Delhi), MA, PhD (Rochester)
Klein, E., LL.M (Buenos Aires), MSc (Dal), Dr.Rer.Pol. (Hamburg)
Lesser, B., BCom (Dal), MA, PhD (Corn)
Marfels, C.T., Diplom-Volkswirt, Dr.Rer.Pol. (Berlin)
McAllister, R.I., MA (Oxon), MA (Cantab)
Osberg, L., BA Hons (Queen's), MPhil, PhD (Yale)
Phipps, S.A., BA Hons (Victoria), MA, PhD (UBC)
Rao, U.L.G., MA, MSc (Andhra), PhD (Western)

Associate Professors

Burton, P., BSc (Saskatchewan), MA, PhD (UBC)
Cross, M.L., AA (Dawson College), BA (Montana), MA (SFU), PhD
(Texas A&M)
Huber, P.B., BA, MA, PhD (Yale)
Mazany, R.L., BSFS (Georgetown), PhD (UBC)

Assistant Professors

Iscan, T., BA (Middle East Tech.), MA, PhD (Cornell)
Xu, K., Dip. (Beijing Teachers' Univ.), MBA, PhD (Concordia)

Special Lecturer

Pinfold, T.A., BA, MA (Western), PhD (Minn)

Adjunct Professors

Amirkhalkhal, S.I., BAHons (Shiraz), MA, PhD (Dal), Saint Mary's
University
Comeau, R.L., BA, MA (SFX), PhD (Brown), (retired)
Cornwall, J.L., BA (Iowa), MSc (London), PhD (Harvard) Professor
Emeritus
Cornwall, W., BA (MSVU), PhD (Dal), MSVU
George, R., BSc (London), MSc (Bristol), PhD (London), (retired)
Mansoorian, A., BSc (LSE), MA (McM), PhD (Queen's), York
Pinfold, T., BA, MA (Western), PhD (Minn)
Rankaduwa, W., BA, MSc (Sri Lanka), MA, PhD (Dal), UPEI
Sharif, N., BA (Punjab), MA (Dacca), MA, PhD (McM)
Sinclair, A.M., BA (Dal), MA, BPhil (Oxon), PhD (Harvard), Dal,
Professor Emeritus

I. 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. Economics 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.

II. Degree Programmes

The department offers BA and BSc degree programmes, 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 classes selected satisfy the overall faculty requirements for the relevant general degree (BA or BSc). See "Degree Requirements" section of this calendar.

A. 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 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.

B. BA Honours Degree Programme (Four Years)

Undergraduate Coordinator: M. Bradfield (Telephone: 494-6989)

Departmental Requirements

1000 level

- ECON 1101.03
- ECON 1102.03

2000 level

- ECON 2200.03
- ECON 2201.03
- MATH 1060.03 or 2060.03 (ECON 2260.03)
- MATH 2080.03 (ECON 2280.03)
- Two of ECON 2233.03, 2234.03, 2238.03, and 2239.03

3000 level

- ECON 3338.03
- ECON 3347.03
- ECON 3348.03

4000 level

- ECON 4100.03
- ECON 4420.03
- ECON 4421.03
- Three to four other Economics credits at or above the 2000 level for a total of nine Economics credits

Other required classes

- MATH 1000.03
- MATH 1010.03
- MATH 2030.03
- Honours Thesis

C. BSc Honours Degree Programme (Four Years)

Undergraduate Coordinator: M. Bradfield (Telephone: 494-6989)

Departmental Requirements

1000 level

- ECON 1101.03
- ECON 1102.03

2000 level

- ECON 2200.03
- ECON 2201.03
- MATH 1060.03 or 2060.03 (ECON 2260.03)
- MATH 2080.03 (ECON 2280.03)
- Two of ECON 2233.03, 2234.03, 2238.03, and 2239.03

3000 level

- ECON 3338.03
- ECON 3347.03
- ECON 3348.03

4000 level

- ECON 4100.03
- ECON 4420.03
- ECPM 4421.03
- Three to four other Economic credits at or above the 2000 level for a total of nine Economics credits.

Other required classes

- MATH 1000.03
- MATH 1010.03
- MATH 2030.03
- Honours Thesis

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 classes to ensure that they satisfy the overall requirements for the 15-credit BSc degree.
4. 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.

D. Combined Honours

Combined honours programmes, BA or BSc, may be arranged with other departments such as Biology, Geology, History, Mathematics, Political Science, Sociology. For combined honours programmes with Economics, students also should consult the other departments concerned.

Required classes are decided on a case-by-case basis and include a core of: ECON 1101.03, 1102.03, 2200.03, 2201.03, 2280.03 (or MATH 2080.03) and ECON 3338.03.

E. BSc Advanced Major Programme (Four Years)

Departmental Requirements

1000 level

- ECON 1101.03
- ECON 1102.03

2000 level

- ECON 2200.03
- ECON 2201.03
- MATH 1060.03 or 2060.03 (ECON 2260.03)
- MATH 2080.03 (ECON 2280.03)
- One other economics credit at or above the 2000 level

3000 level

- ECON 3338.03
- 2.5 to 3.5 other economics credits at or above the 3000 level for a total of 6 credits in Economics

Other required classes

- MATH 1000.03
- MATH 1010.03
- MATH 2030.03

A student who wants the option of 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, however, allows a maximum of only nine credits in economics while the honours programme allows a maximum of eleven.

F. BA Advanced Major Programme (Four Years)

Departmental Requirements

1000 level

- ECON 1101.03
- ECON 1102.03

2000 level

- ECON 2200.03
- ECON 2201.03
- Two other credits in Economics at or above the 2000 level

3000 level

- Three credits in Economics at or above the 3000 level

While the total number of credits required for the advanced major is the same as for an honours degree, the honours programme in economics requires an honours essay and must include a core of classes in economics as given above. In addition, the honours programme requires a *higher academic standing* than does the advanced major. However, the advanced major provides a comprehensive programme not available with the three-year programme. 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 the option of 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 programme can be converted to an advanced major at the student's discretion. The advanced major allows a maximum of only nine credits in economics while the honours programme allows a maximum of eleven.

G. BA Major in Economics (Three Years)

Undergraduate Coordinator: M. Bradfield (494-6989)

Departmental Requirements

1000 level

- ECON 1101.03
- ECON 1102.03

2000 level

- ECON 2200.03
- ECON 2201.03
- At least one other credit in Economics at or above the 2000 level

3000 level

- At least two credits at or above the 3000 level

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.

H. BSc Degree Programme (Three Years)

Undergraduate Coordinator: M. Bradfield (Tel. 494-6989)

For the general description of the programme see the description of the BA degree programme.

Departmental Requirements

1000 level

- ECON 1101.03
- ECON 1102.03

2000 level

- ECON 2200.03
- ECON 2201.03
- MATH 1060.03 or 2060.03 (ECON 2260.03)
- MATH 2080.03 (ECON 2280.03)

3000 level

- ECON 3338.03
- At least 1.5 other Economic credits at or above the 3000 level

Other required classes

- MATH 1000.03
- MATH 1010.03
- MATH 2030.03

Combined programmes may also be arranged, with economics as the major or minor subject in association with other fields such 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.

I. Co-operative Education Programme

The Co-operative Education Programme combines academic training with career-related experience in the work place. The programme integrates eight academic terms with four work-terms. Work-terms are normally 13 to 16 weeks in length. The programme requires four work-terms and normally 4 ½ years to complete. A fifth work-term is optional, and the programme requires correspondingly longer to complete if five work-terms are selected.

A student in the co-operative programme must complete SCIE 5730.00, a non-credit, interdisciplinary seminar, before registering for the first work-term. The student must also register for each work-term ECON 8891.00, 8892.00, 8893.00 and 8894.00 (optionally 8895.00, depending on how many work-terms have already been completed).

The co-operative programme begins in the second year of study, and a grade average of at least B for the first year of study is required for admission. In addition to completing four work-terms, a student in the co-operative programme must fulfil the requirements of either a 20 credit BSc Advanced Major programme while maintaining at least a B average; or a 20-credit BSc Honours Programme. Departmental approval is required to obtain admission to the Co-operative Education Programme in Economics. Interested students should inquire about the programme before beginning their second year of study.

Additional information may be found in the Co-operative Education in Science entry in this calendar.

J. 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 classes, 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.

III. Classes Offered

Classes marked with an * are normally offered on a two year rotational basis. Please consult the department for details regarding rotation scheme. 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 offerings.

ECON 1101.03: Principles of Microeconomics.

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, emphasizing the behaviour and analysis of individual agents in the economy (consumers, producers, markets).

FORMAT: Lecture 3 hours

ECON 1102.03: Principles of Macroeconomics.

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, emphasizing aggregate economic behaviour at the national level. ECON 1101.03 is not required before taking ECON 1102.03

FORMAT: Lecture 3 hours

ECON 1101.03 and 1102.03 (together) satisfy the principles of Economics requirement for Economics majors and for Bachelor of Commerce students.

ECON 2200.03: 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

PREREQUISITE: ECON 1101.03 or equivalent

ECON 2201.03: 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 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

PREREQUISITE: ECON 1102.03 or equivalent

ECON 2233.03: Canadian Economic History I.

An examination of the economic history of Canada from the time of Confederation to WWI. Major topics explored include: the economic reasons for Confederation, the building of the CPR, the Wheat Boom, foreign trade and investment and the roots of regional disparities.

FORMAT: Lecture 3 hours

PREREQUISITES: Introductory Economics and some knowledge of history are recommended.

ECON 2234.03: Canadian Economic History II.

An examination of Canadian economic history since WWI, with a concentration on the interwar period from 1919-1939. Major topics to be covered include: the decline of the Prairie wheat economy, the Great Depression, U.S. direct investment, transportation and the changing role of the state in the economy.

FORMAT: Lecture 3 hours

PREREQUISITES: Introductory Economics and some knowledge of history are recommended

*ECON 2238.03: 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

PREREQUISITE: Introductory Economics

***ECON 2239.03: The European Economy In Historical Perspective - After the Industrial Revolution.**

A self-contained class (may be taken separately from ECON 2238.03) examining the contrasting development patterns of various industrialized European countries after their respective industrial revolutions and up to about 1960. 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

PREREQUISITE: Introductory Economics

ECON 2251.03: An Applied Class in Economic Development and the Environment - Concepts, Policies and Projects

This class is designed around alternative concepts of sustainable development, with emphasis on key theories, experiences and issues of relevance to developing countries and less prosperous regions of industrial countries - including Atlantic Canada. In addition to reading and written work, this class extensively draws upon case study approaches to learning - both within and outside the university setting. There are three conceptual levels: (1) Principles and tensions behind sustainable development; (2) International, national and regional policy and planning approaches re: sustainable development; (3) Projects for sustainable development. PROFESSOR SIGNATURE REQUIRED.

FORMAT: Lecture, case work with group presentations, tutorials, 3 hours

PREREQUISITES: Introductory Economics

ECON 2252.03: An Applied Class in the Economic Development of Communities and the Environment.

This class follows Economics 2251.03 and (building further on concepts of sustainable development as they particularly apply to developing countries and less prosperous regions of industrial countries) provides participants with field work experience at the community development level. Students have an opportunity to work on projects hinged to governments, business and/or non-governmental organizations.

PROFESSOR SIGNATURE REQUIRED.

FORMAT: Lecture, case studies and field work with group presentations and an end term conference, 3 hours and group tutorials

ECON 2260.03: Statistics I.

See class description for MATH 2060.03, in Mathematics section of this calendar.

ECON 2280.03: Statistics II.

See class description for MATH 2080.03, in Mathematics section of this calendar.

SCIE 3000.06: Science Fundamentals.

See Class description in Science, Interdisciplinary section of this calendar.

***ECON 3241.03: Comparative Economic Systems: National 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

PREREQUISITE: ECON 2200.03

***ECON 3242.03: 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

PREREQUISITE: ECON 2200.03, plus an additional half-class in Economics

***ECON 3315.03: Labour Economics.**

The theory of labour markets is emphasized, in particular the implications of alternative viewpoints which seek to explain relative wages and unemployment.

FORMAT: Lecture 3 hours

PREREQUISITE: ECON 1101.03, 1102.03, 2200.03 and 2201.03 (or equivalents)

***ECON 3317.03: 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/seminar

PREREQUISITE: ECON 1101.03, 1102.03, 2200.03 (or equivalent); ECON 3315.03 is highly recommended

***ECON 3318.03: Industrial Organization - Structures of Industrial Markets.**

What determines the structure of an industry? Size distribution of firms, concentration, internal and external growth of firms, and entry barriers are discussed in the context of Canadian and U.S. markets. Emphasis is placed on industrial concentration as the foundation for market power.

FORMAT: Lecture 2 hours

PREREQUISITE: Introductory Economics and ECON 2200.03 (or equivalent)

***ECON 3319.03: Industrial Organization - Market Conduct and Market Performance.**

Market conduct refers to a firm's product and pricing strategies to maintain or expand its market share in the competitive environment of global markets. Market conditions will determine whether a firm will pursue this either in non-cooperative or cooperative form with other competitors. The discussion on market performance will include an examination of the concept of workable competition and an overview of the Canadian public policy approach to deal with abuse of market power and other anticompetitive behaviour.

FORMAT: Lecture 2 hours

PREREQUISITE: Introductory Economics and ECON 2200.03 (or equivalent); ECON 3318.03 desirable.

***ECON 3326.03: 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 ECON 4426.03.

FORMAT: Lecture 3 hours

PREREQUISITE: ECON 1101.03, 1102.03 and 2201.03 (or equivalent)

***ECON 3330.03: 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

PREREQUISITE: Introductory Economics and ECON 2200.03 (or equivalent)

***ECON 3332.03: 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

PREREQUISITE: Introductory Economics and ECON 2200.03 (or equivalent)

****ECON 3333.03: 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

PREREQUISITE: Introductory Economics, ECON 2201.03 (or equivalent). ECON 3347.03 and 3348.03 are desirable

***ECON 3335.03: Environmental Economics.**

This class serves as an introduction to environmental economics. Topics include social decision making, externalities and public goods, regulatory approaches (standards, charges, tradable permits), forms of value derived from the environment and measurement techniques.

FORMAT: Lecture 3 hours

PREREQUISITE: ECON 1101.03, 1102.03, 2200.03

***ECON 3336.03: 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, tutorials

PREREQUISITE: Introductory Economics, and at least one class in both Political Science and Canadian History are desirable

ECON 3338.03: 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

PREREQUISITE: MATH 1000.03 (or equivalent) and ECON 2280.03 or Math 2080.03

***ECON 3344.03: Public Finance I.**

This class 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: Lecture 3 hours

PREREQUISITE: Introductory Economics and ECON 2200.03 (or equivalents); ECON 2201.03 is recommended

***ECON 3345.03: Public Finance II.**

This class studies the economics of taxes and transfers. Equity and efficiency effects of both are considered.

FORMAT: Lecture 3 hours

PREREQUISITE: Introductory Economics, ECON 2200.03 and 2201.03 (or equivalents)

***ECON 3347.03: Classical Political Economy.**

The theories of production, value, distribution, and economic growth developed in classical political economy will be discussed in this class. Reactions to classical political economy and links between this body of thought and macroeconomics will be included as time permits.

FORMAT: Lecture 3 hours

PREREQUISITE: ECON 1101.03, 1102.03 and 2200.03 (or equivalent). ECON 2201.03 (or equivalent) is recommended

***ECON 3348.03: 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

PREREQUISITE: ECON 1101.03, 1102.03 and 2200.03 (or equivalent). ECON 2201.03 (or equivalent) is advised.

***ECON 3350.03: 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

PREREQUISITE: ECON 1101.03, 1102.03 and 2200.03. Introductory Statistics is desirable

ECON 4100.03: Honours Seminar.

This is a required class for honours students, optional for others.

The class 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 1.5 hours for both terms

PREREQUISITE: ECON 2200.03 (or equivalent) and 2201.03 (or equivalent) and MATH 2060.03 and 2080.03

***ECON 4418.03: Foundations of Public Policy Towards Business.**

In this class 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

PREREQUISITE: ECON 3318.03 and 3319.03 desirable

ECON 4420.03: Microeconomic Theory.

A basic but rigorous introduction to modern microeconomic theory. Emphasizes the working of an economy as a system of interdependent decision makers. Deals in detail with a selection of topics from the theory of choice as applied to consumers and firms, general equilibrium, welfare, linear models in economic analysis, choice under uncertainty, game theory, alternative solution concepts for competitive economies, social choice, stability, optimal growth.

FORMAT: Lecture 3 hours

PREREQUISITE: ECON 2200.03 (or equivalent) and MATH 1000.03 and 1010.03

ECON 4421.03: 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

PREREQUISITE: ECON 2201.03 (or equivalent) and MATH 1000.03 and 1010.03 (or equivalent)

***ECON 4426.03: 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

PREREQUISITE: ECON 2201.03 (or equivalent); It is advantageous for students to have completed ECON 3326.03 as well

***ECON 4431.03: International Finance.**

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

PREREQUISITE: ECON 2201.03 (or equivalent)

****ECON 4446.03: Classical Liberalism, and Democracy.**

See class description for PHIL 4470.03, in the Philosophy section of this calendar.

ECON 8891.00: Co-op Work-Term I

ECON 8892.00: Co-op Work-Term II

ECON 8893.00: Co-op Work-Term III

ECON 8894.00: Co-op Work-Term IV

SCIE 8700.00: Science Co-op Seminar.

See class description in Science, Interdisciplinary section of this calendar.

Engineering

See DalTech section of this calendar.

English

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Dean

Taylor, G.D., BA, PhD (Penn)

Chair

Baxter, J. (494-3411)

Undergraduate Advisor

Consult Department

Professors Emeriti

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Gray, J., MA (Aberd), MA (Oxon), PhD (Montreal), FRSC, FRSA
Ross, M.M., 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), LLD (St.F.X.), FRSC
Sprott, S.E., MA, BD (Melb), PhD (Col)

Professors

Baxter, J.R., BA, BEd, MA, PhD (Alta)
Furrow, M.M., BA (Dal), MA, MPhil, PhD (Yale)
Huebert, R., BA (Sask), MA, PhD (Pitt)
Monk, P., BA (Reading), MA (Carleton), PhD (Queen's)
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Wainwright, J.A., BA (Tor), MA, PhD (Dal)

Associate Professors

Diepeveen, L.P., BA (Calvin Col), MA, PhD (Ill)
Greenfield, B., BA (York), MA (McG), PhD (Columbia)
Higgins, A., BA (Conn), MA (McG), MA (Mass), MA, PhD (Yale)
Li, V., BA, MA (UBC), PhD (Cantab)
Luckyj, C., BA, MA, PhD (Tor)
McNeill, D., BA (Concordia), MA (UNB), PhD (McM)
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Assistant Professors

Maitzen, R., BA (UBC), MA, PhD (Corn)
Morgan, H.E., BA (UBC), MA (Wash), BLitt (Oxon), PhD (Wash)
Thompson, J.A., BA (Western), MA, PhD (Tor)
Stewart, A.F., BA (Guelph), MA, PhD (Queen's)

Adjunct Professor

Andrews, A.R., BA, DipEd, MA (Leeds), PhD (Ill), FRSA

Senior Instructor

Choyce, L., BA (Rutgers), MA (Montclair), MA (CUNY)

I. Introduction

The study of English includes both analysis of texts and awareness of contexts. The texts proposed for analysis in various English classes will range from the traditional to the contemporary; English is a discipline which can and does adjust to include writings by Tomson Highway, Toni Morrison, and Chinua Achebe alongside words by Chaucer, Shakespeare, Milton, Austen, and the rest. The wide range of human experience represented in these texts can provide the student with what Kenneth Burke has called

"equipment for living." In more practical terms, the discipline of English fosters the development of various human skills: it requires the student to think, and to use language with clarity, judgment, and imagination.

But individual works of literature are also related in various ways to their social, cultural, and political contexts. For this reason, curiosity about a particular text often leads to enquiries that touch upon history, philosophy, politics, religion, biography, and the fine arts as well. The written text turns out to be a link between an individual sensibility and the rest of the world. The value of English studies therefore, though difficult to measure, can be discovered both in the large semiotics of the cultures to which we belong, and in the smallest nuances of the language we use.

In the first year, ENGL 1000.06 is required of all students who wish to take further English classes. There are about twenty different sections. 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 1000.06 Supplement which specifies the aims and reading lists of each section. Classes numbered from 2000 to 3999 are especially suited for those concentrating in English, studying it as a complement to their main area, or taking an elective; classes numbered 4000 to 4099 are seminar classes designed primarily for students in the Advanced majors programme, while classes numbered 4250 and above are specialized seminars for Honours students. Honours classes are open to General students with permission of the Chair and the professor concerned. English 2205.06 is required of all English Majors, Advanced Majors, and Honours students and is normally taken in the second year. A Supplement describing Upper-year General and Honours classes in detail is available from the English Department.

II. Degree Programmes

Students should consult the "Degree Requirements" section of this calendar for specific regulations.

A. BA with Honours in English

This degree is a preparation for students going on to advanced study and for other highly-motivated students. It is designed to provide knowledge of the historical development of literature in English and to introduce students to the critical and theoretical paradigms of the discipline. It requires students to take:

1. At least nine and no more than eleven credits in English beyond the 1000 level, of which
 - (a) One must be ENGL 2205;
 - (b) Classes will be selected from the 2800, 3000 and 4000 level;
 - (c) At least five credits must be selected from Groups A, B and C in the 4000 level; and
 - (d) At least one credit must be taken in each of Groups A, B, and C in the 4000 level.
2. An additional grade (the "21st grade" - currently met by 0451.00)
3. Honours students may not take 2000- and 3000-level classes that substantially repeat the material of a 4000-level class in Group A, B, or C which they have already taken.

NOTE: For purposes of the honours programme and its requirements, classes in the 4000 series are divided into the following groups:

Group A (early period): 4251.06, 4252.06, 4253.06, 4351.06, 4352.06, 4360.03
Group B (middle period): 4255.06, 4256.06, 4354.06, 4355.06, 4356.06, 4457.06
Group C (later period): 4357.06, 4453.06, 4455.06
Group D (Special topics): 4001.03, 4002.03, 4003.03, 4004.03, 4005.03, 4006.03, 4007.03, 4008.03, 4009.03, 4010.03

B. 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. A Combined Honours with English as one of the allied subjects requires students to take:

- At least four and no more than nine credits in English beyond the 1000-level, of which
 - One must be ENGL 2205;
 - Three must be selected from the 4000-level, one from each of Groups A, B, and C as listed above (under BA with Honours in English); with permission of the Chair, one or more may be selected Group D.
- English 0451.00 (the "21st grade") for those students weighting their programme in favour of English.

Combined Honours students may not take 2000- and 3000-level classes that substantially repeat the material of a 4000-level class which they have already taken.

C. BA with Advanced Major in English

This degree is a wide-ranging preparation for a variety of careers, including the teaching of English at elementary and high-school level. It is organized to develop skills in reading, interpreting, and writing about a variety of literary forms. It requires students to take:

- At least six and no more than nine credits in English beyond the 1000 level of which:
 - One must be ENGL 2205;
 - Full- and half-credit classes will be selected from the 2000- and 3000-level, and half-credit classes from the 4000-level.
 - At least three credits must be taken from beyond the 2000-level;
 - At least one half-credit must be taken in the 4000-level;
 - One credit must be taken in poetry, one credit in drama, and one credit in prose or prose fiction; and
 - At least one credit must be taken in literature before 1900.

D. BA with Major in English

This degree is a general liberal arts degree with a concentration in English. It permits a wide range of choice in class selection. It requires students to take:

- At least four and no more than eight credits in English beyond the 1000 level, or which:
 - One must be ENGL 2205;
 - Classes will be selected from both the 2000- and 3000-level; and
 - At least two credits must be beyond the 2000 level.

III. Classes Offered

NOTE: Classes marked * may not be offered every year. Please consult the current timetable to determine this year's class offerings.

ENGL 1000.06: Introduction to Literature.

Since ENGL 1000.06 consists of sections taught by many different instructors, statements about its objectives and approach must be confined to generalizations. All instructors of ENGL 1000.06 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.

Successful completion of ENGL 1000.06 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.

FORMAT: Writing Requirement, lecture / discussion 3 hours

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 1000.06.

*ENGL 2028.03: 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 1000.06

ENGL 2029.03: Framed Narratives.

This class studies framed narratives - stories within stories - focusing on the dramatic relationship between the frame and the stories within it, and what this form tells us about the nature of storytelling itself.

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: ENGL 1000.06

*ENGL 2034.03: 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 1000.06

*ENGL 2200.06: 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 1000.06

*ENGL 2205.06: Literary Landmarks.

This class studies many of the most influential texts from the beginnings of English literature to the present. These landmarks provide some historical orientation in the literary landscape and help to make students aware of the diversity available in literary studies. This class is a requirement for all English Majors, Advanced Majors, and Honours students and is normally taken in the second year.

FORMAT: Lecture/discussion 3 hours

PREREQUISITE: ENGL 1000.06

ENGL 2206.06: Women Writers.

A survey of writers and texts from 600 years of women's writing in English, this class looks at common theses and forms of a female literary tradition. It addresses such questions as the relation of sex and gender to authorship and genre, the relation between women's texts and the male literary tradition, and the relation between literary and "non-literary" forms of writing by women.

FORMAT: Lecture/discussion 2 hours

CROSS-LISTING: WOST 2206.06

*ENGL 2207.06: 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. Approved with Canadian Studies.

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: ENGL 1000.06

*ENGL 2208.06: 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 1000.06

***ENGL 2211.06: 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 1000.06
CROSS-LISTING: WOST 2211.06

***ENGL 2220.06: 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 1000.06

***ENGL 2221.06: 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 1000.06
CROSS-LISTING: WOST 2200.06

***ENGL 2225.06: 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 1000.06

***ENGL 2226.06: 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 1000.06

***ENGL 2227.06: 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 3 hours
PREREQUISITE: ENGL 1000.06

***ENGL 2231.06: 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 1000.06

***ENGL 2233.06: Science Fiction.**

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 1000.06

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 1000.06.

ENGL 2250.06: Topics in Cultural Studies

A study of various aspects and issues of cultural production. Specific topics, which will vary from year to year, may include either canonical or popular forms of expression. Topics might include medieval guild drama, 18th-century newspapers, contemporary detective fiction, or Bob Dylan and the literature of the 1960s. Whatever the specific topic offered in a given year, a consistent concern will be to examine not just texts but also the social and historical structures in which they participate.
FORMAT: Lecture/discussion 2 hours
PREREQUISITE: ENGL 1000.06

ENGL 3014.03: The Other Shakespeare.

This class examines some of Shakespeare's less familiar works - long poems, sonnets and lesser-known plays.
FORMAT: Lecture/discussion 2 hours

***ENGL 3018.03: Arthur, The Age and Legend.**

The forms and import of diverse Arthurian works will be the subject of this class, which will investigate the sixth-century origins of Arthur's legend and its transformations to the present day. Central stories concerning the kings, knights, queens and ladies of Logres and the stewards and seekers of the grail will be studied using texts from *The Mabinogion* and *Lanzelet* to the *Mists of Avalon*, authors from Geoffrey of Monmouth, Chrétien de Troyes, Wolfram von Eschenbach and Sir Thomas Malory to Tennyson, Browning, Stewart and Percy.
FORMAT: Lecture/discussion 2 hours
PREREQUISITE: ENGL 1000.06

ENGL 3029.03: Victorian Poetry

"As civilization advances," Macaulay wrote in 1825, "poetry almost necessarily declines." This class examines the ways Victorian poets from Emily Brontë to Robert Browning responded to the challenge of reinventing poetry for their "advanced" age. Specific emphases will vary, but a recurrent theme will be the role of the poet or the function and purpose of poetry in an increasingly technological and scientific culture, as well as the problems of writing as a woman poet.
FORMAT: Lecture/discussion 2 hours
PREREQUISITE: ENGL 1000.06

ENGL 3030.03: Victorian Sages

Victorian writers and intellectuals enjoyed a public prominence and social status almost unthinkable today, writing from positions of authority and presenting themselves as teachers, prophets, moralists, and arbiters of everything from aesthetics to ethics. This class focuses on the non-fiction prose of the period, examining the engagement of writers such as Thomas Carlyle, John Stuart Mill, Matthew Arnold, John Ruskin, Harriet Martineau, George Eliot, and Oscar Wilde with the social, political, religious, artistic, and scientific issues of their day.
FORMAT: Lecture/discussion 2 hours
PREREQUISITE: ENGL 1000.06

***ENGL 3050.03: Contemporary Women Poets.**

During the last few decades, an extraordinary number of powerful new women poets have appeared on the literary scene. This class focuses on selected works written by these poets, and explores the ways in which monolithic ideas of "woman" have been challenged by individual poets who are positioned differently by race, class, sexual orientation and national identity.
FORMAT: Lecture/discussion 2 hours
PREREQUISITE: ENGL 1000.06
CROSS-LISTING: WOST 3050.03

ENGL 3061.03: American Literature to 1865.

A survey of the major writers of the United States up to the end of the Civil War. This period includes the earliest practitioners of the modern short story and the detective story, Hawthorne and Poe; radically inventive poets, Whitman and Dickinson; perhaps the greatest "nature writer" of all time, Thoreau; one of the most popular and most politically influential novels of all time, Uncle Tom's Cabin; Moby Dick, the greatest sea novel; great testaments to the strength and dignity of the human spirit in the "escaped-slave" narratives of Frederick Douglass and Harriet Jacobs.

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: ENGL 1000.06

ENGL 3062.03: American Literature, 1865-1914.

A survey of the major writers of the United States from the Civil War to the beginning of the First World War. During this period Mark Twain achieved international fame, while others, such as Henry James and Stephen Crane, though less popularly celebrated, were widely read and highly influential. Women writers achieved notable distinction both in poetry and fiction, as the examples of Emily Dickinson and Edith Wharton would suggest. Having preserved itself as a nation, the United States was now entering into competition with European cultures, not only in political and economic terms, but also in matters of literature and art.

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: ENGL 1000.06

ENGL 3070.03: African American Writing.

An introduction to some major modes of writing in the African American community. Subjects of enquiry may include the "escaped-slave" narratives of the nineteenth century, or works produced by members of the Harlem Renaissance, or poetry and fiction by contemporary African American women writers.

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: ENGL 1000.06

***ENGL 3075.03: Multicultural Fictions.**

A study of the fiction of postcolonial cultures by writers from such apparently different places as North, Central and South America, Africa, Asia and Australasia. These writers explore the interface of race, ethnicity, gender, and politics of personal and communal power and so re/shape our reading of the past and present. Their work is often grounded in local place and time, but inevitably transcends regional borders in a voicing of issues that eradicate the safety of distance between so-called first- and third-world concerns.

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: ENGL 1000.06

ENGL 3076.03: Multicultural Poetry.

This class studies poems in English from a wide variety of countries. These poems explore the social and political nature of poetic expression in familiar and often surprising ways that cross borders between language and experience, the individual and the group, the writer and the reader. The class addresses race, ethnicity and gender, as well as how a poem says what it says.

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: ENGL 1000.06

***ENGL 3095.03: Narrative in the Cinema.**

This class will provide a brief introduction to the study of film narrative. Through an examination of select films from throughout the history of the medium, this class will consider various forms and conventions of cinematic fiction-making. Although social, political, psychological and other non-formal aspects of film will be discussed, the class will be primarily concerned with the aesthetics and visual styles at work in the films under consideration.

FORMAT: Lecture/discussion/screening 4 hours

PREREQUISITE: ENGL 1000.06

***ENGL 3201.06: 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 1000.06

***ENGL 3206.06: 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 1000.06

***ENGL 3209.06: Twentieth-Century Fiction.**

An introduction to the main thematic and technical trends in the modern novel.

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: ENGL 1000.06

***ENGL 3210.06: 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 1000.06

***ENGL 3212.06: 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 1000.06

***ENGL 3213.06: 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 1000.06

***ENGL 3214.06: 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 hours

PREREQUISITE: ENGL 1000.06

***ENGL 3215.06: 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 1000.06

***ENGL 3216.06: 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 1000.06

***ENGL 3218.06: 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 3218.06 is available for Honours credit to students who have previously taken ENGL 4351.06.

FORMAT: Lecture/discussion 2 hours
PREREQUISITE: ENGL 1000.06

***ENGL 3219.06: 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 1000.06

***ENGL 3224.06: 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 1000.06

***ENGL 3225.06: Restoration and Eighteenth-Century Literature.**

This class will survey literary works in drama, poetry and prose form 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 1000.06

***ENGL 3229.06: 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 1000.06

***ENGL 3232.06: 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 1000.06

***ENGL 3244.06: 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 1000.06

Classes in the 4000 Series

Classes in the 4000 series focus on more specialized topics than other classes in the major programme. They are seminar classes designed for more experienced students in the Honours and Advanced Major Programmes. Classes numbered 4000 to 4099 are seminars primarily

for Advanced Majors, while classes numbered 4250 and above are Honours seminars. You must have permission of the Department to take classes in the 4000 series.

***ENGL 4001.03: Studies in an Individual Author I.**

***ENGL 4002.03: Studies in an Individual Author II.**

***ENGL 4003.03: Studies in Genres I.**

***ENGL 4004.03: Studies in Genres II.**

***ENGL 4005.03: Studies in National Literatures in English I.**

***ENGL 4006.03: Studies in National Literatures in English II**

***ENGL 4007.03: Studies in Literary History I**

***ENGL 4008.03: Studies in Literary History II**

***ENGL 4009.03: Studies in Literary Theory I**

***ENGL 4010.03: Studies in Literary Theory II**

ENGL 0451.00A: 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 fulfilment of requirements for the class.

FORMAT: Lecture 1 hour, first term only

***ENGL 4251.06: 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

***ENGL 4252.06: 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

***ENGL 4253.06: 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

***ENGL 4255.06: 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

***ENGL 4256.06: 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

***ENGL 4351.06: 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

***ENGL 4352.06: 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

***ENGL 4354.06: Nineteenth Century Novel.**

The novels of the period from Scott and Austen to Hardy are studied.

FORMAT: Seminar 2 hours

***ENGL 4355.06: 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

***ENGL 4356.06: 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

***ENGL 4357.06: 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. Approved with Canadian Studies.

FORMAT: Seminar 2 hours

***ENGL 4360.03: 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 3218.06, 4253.06, 4351.06 or instructor's consent

***ENGL 4453.06: Twentieth-Century English Literature.**

A series of explorations designed to interpret some of the literary texts written in our century and the (British) culture which produced them.

FORMAT: Seminar 2 hours

***ENGL 4455.06: 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

***ENGL 4457.06: 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

Environmental Science

I. 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 humankind's impact on the environment.

II. Degree Programmes

Dalhousie believes that the importance of environmental science in the undergraduate curriculum requires it to be taught in the relevant classes of all disciplines (i.e. "across the curriculum"). For this reason rather than offer environmental science as a separate degree programme, we offer it as an integral part of the existing basic disciplines. 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 BSc in that discipline. Current programs that provide streams emphasizing environmental subjects are Earth Sciences (particularly Environmental Geology and Hydrogeology) Biology and Marine Biology. Of particular relevance is the programme specializing in Earth Systems Science (see Earth Systems Science section of this calendar).

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 BSc 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

III. Classes Offered

These classes are offered within the Faculty of Science with particular relevance to Environmental Science

A. Biology

BIOL 2001.03: Marine Diversity.

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.

INSTRUCTOR: C. Corkett, R. Scheibling

FORMAT: Lecture 2 hours, lab 3 hours

PREREQUISITE: One full credit in Biology at the 1000-level or SCIE 1500.30 (Grade B- or better)

BIOL 2002.03: Terrestrial Diversity.

A survey of the terrestrial plants, fungi and animals. The class emphasizes the restrictions imposed on terrestrial adaptations by the aquatic origins of the colonizers and discusses the physiology of living in a terrestrial environment.

INSTRUCTOR: M. Johnston, M. Leonard and A.H. Mills

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITE: One full credit in Biology at the 1000-level or SCIE 1500.30 (Grade B- or better)

BIOL 2060.03: Introductory Ecology.

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.

INSTRUCTOR: C. Beauchamp, J. Hutchings, R. Scheibling, S. Waide

FORMAT: Lecture 3 hours, lab/tutorial 2 hours

PREREQUISITE: One full credit in Biology at the 1000-level or SCIE 1500.30 (Grade B- or better)

EXCLUSION: BIOL 2046.06, BIOL 2066.03

BIOL 3060.03: 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, resource degradation, warfare, and broader topics such as environmental impact assessment and ecological monitoring and research.

INSTRUCTOR: B. Freedman

FORMAT: Lecture 2 hours, tutorial 3 hours

PREREQUISITE: BIOL 2060.03 (or see instructor)

CROSS-LISTING: BIOL 5060.03

BIOL 3061.03: Communities and Ecosystems.

This class is divided into three sections:

- (A) Introduction, History and Concepts to Community Structure and Stability;
- (B) Environmental Assessment and Management at the Ecosystem level; and
- (C) Case Studies and Global Problems.

INSTRUCTOR: P.A. Lane

FORMAT: Lecture 3 hours

PREREQUISITE: BIOL 2060.03

BIOL 3063.03: Resource Ecology.

Introduction to ecologically 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.

INSTRUCTOR: R. Doyle, B. Freedman, J. Hutchings
FORMAT: Lecture/seminar 3 hours
PREREQUISITE: BIOL 2060.03; MATH 1010.03, 1060.03 or equivalent

BIOL 3066.03: Plant Ecology.

Ecology refers both to the interactions between organism and environment as well as to the formal scientific study of these interactions. In plants these interactions can involve other plants, as in competition, or animals, as in pollination, herbivory, seed predation and seed dispersal. Plants stand still after they have passed the seed stage. Standing still means that plants must survive and make offspring in an environment that is imposed upon them. This class examines the causes and consequences of being a plant from an evolutionary perspective. Ecological interactions both cause natural selection and are themselves the consequences of evolution. The overriding theme of the class, therefore, is that of the ecological theatre and the evolutionary play (in the words of G.E. Hutchinson). This class concentrates on individual interactions, adaptations and processes. Processes, such as nutrient cycling, that occur at the level of communities or ecosystems will receive little attention.

INSTRUCTOR: M. Johnston

FORMAT: Lecture 3 hours, lab/tutorial 3 hours, one/two field trips on weekends including first weekend after classes begin

PREREQUISITE: BIOL 2030.03 and 2060.03

CROSS-LISTING: BIOL 5066.03

BIOL 3069.03: 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

PREREQUISITE: BIOL 2060.03 (minimum grade of B), MATH 1010.03, 1060.03 or equivalent

BIOL 3324.06: Entomology.

(May be offered in Summer 1998)

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.

INSTRUCTOR: E. Angelopoulos

FORMAT: Lecture 2 hours, lab 3 hours

BIOL 3601.03: Nature Conservation.

The class 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.

INSTRUCTOR: M. Willison

FORMAT: Lecture 3 hours/tutorial 1 hour

PREREQUISITE: One full-credit in Biology at the 1000-level or SCIE 1500.30 or permission of instructor

EXCLUSION: BIOL 3410.03 taken in 91/92 or 92/93

BIOL 3614.03: Field Ecology.

This class provides practical experience in techniques of quantitative field ecology, including design of field sampling programmes and manipulative experiments. Students examine specific ecological questions by collecting, analyzing, and interpreting field data and by writing scientific reports. Projects include a variety of experimental and descriptive studies on plant and animal populations or communities in intertidal, lacustrine, and forest ecosystems. Lectures and field trips will involve other biology

professors. Specific topics include spatial distributions of organisms, animal orientation and movement, disturbance and succession, lake trophic status, and function of behaviour. Instruction includes use of PC and Macintosh computer analysis packages (e.g. Excel, Cricketgraph) and techniques of scientific writing. Evaluation is based on written assignments and participation in field, lab, and data analysis. No exams are given. Prospective students must apply to the instructor prior to registration; fourth year Biology students have priority. A special fee is charged to cover costs of transportation (consult department regarding fees or to obtain an application).

SIGNATURE REQUIRED

INSTRUCTOR: C. Staicer

FORMAT: Combined lecture/lab for 3 hours per week, plus 8 days of field work in September (the two days after Labour Day and the following three weekends)

PREREQUISITE: BIOL 2060.03 and MATH 1060.03, and 2080.03 or equivalent

BIOL 3620.03: Field Survey of Terrestrial Biodiversity.

This summer class provides field experience with biodiversity survey techniques and practical experience in relating trends in biodiversity to natural and anthropogenic variation in terrestrial environments. Lectures will provide an overview of relevant concepts in biodiversity and ecology, as well as focused instruction on the ecology and taxonomy of particular groups of organisms such as lichens, mosses, higher plants, insects, amphibians, birds, and mammals. Students will take field trips to a variety of terrestrial habitats. At each site, students will gain experience with standard techniques used to quantify the biodiversity of different groups of terrestrial organisms. Students will learn to use Excel to tabulate and analyze data, and will write several reports based on the techniques used, the data collected, and the major biodiversity issues involved. Five days will be devoted to planning, conducting, writing-up and presenting to the class an independent project of the student's own choice. Prospective students must fill out an application and pay a transportation fee to the department prior to registration (contact instructor or department for more information).

INSTRUCTOR: C. Staicer

FORMAT: Field intensive

PREREQUISITE: BIOL 1000.06 or equivalent introduction to ecology and the diversity of organisms

BIOL 3622.03: Ornithology.

The study of birds in their natural habitats will be the focus of this field-intensive summer class. Each day's activity will be either field trip, lecture, laboratory, or a combination of these, depending on weather. Lectures and laboratory exercises will complement field work and provide an overview of avian biology, from evolution and systematics to anatomy and physiology. A wide variety of field sites in Nova Scotia will be visited, including: Coniferous and deciduous forests of various types; coastal marsh, tide flats, beach, grassy dunes, and rock shore; freshwater lakes, and offshore islands. Students will keep a field notebook and prepare written reports summarizing field observation and addressing particular questions. Students will learn techniques for the scientific study of bird populations, including identification of species by sight and sound. Exams will test student comprehension of the lecture and laboratory material, as well as identification skills. For the last week of the class, students will design and conduct independent projects to test a functional hypothesis about the behaviour or ecology of birds. On the final day, students will present their work to the class in research seminar format. One or more weeks will be spent at various field camps; extra fees will be charged to cover costs of transportation and camping.

INSTRUCTOR: C. Staicer

FORMAT: Field intensive

PREREQUISITES: BIOL 2001.03 or 2002.03

BIOL 3623.03: Coastal Ecology.

This summer class will provide students with field experience in various aspects of the ecology of near-shore marine systems. Class projects will include the following: The zonation of intertidal communities along with marine-terrestrial gradients of rocky shores,

snady beaches, and saltmarch-tidal flats; the behaviours of intertidal animals; field experiments in marine ecology; and methodologies for ecological sampling and study design. Students will obtain hands-on experience in measuring physical factors (e.g. wave action, desiccation, temperature, solar radiation, sediment structure) and biological interactions (e.g. predation, competition, facilitation) to determine how these relate to patterns of distribution and abundance of organisms. During the second half of the class, students will design, conduct, and present independent research projects. Field trips will leave from the university each day. This class carries an additional fee to cover the costs of transportation.

FORMAT: Field intensive

PREREQUISITES: 2001.03 and 2060.03

BIOL 3624.03: Freshwater Systems.

This field class will introduce students to the ecology of freshwater ecosystems. Field work will focus on the unique freshwater system consisting of Dollar Lake, Dollar Brook, and the Musquodoboit River, approximately 60 minutes north of Halifax. The first day will include lectures that provide an overview of freshwater ecology and some of the field and laboratory techniques to be used. Physical, chemical and biological features will be quantified and their inter-relationships studied. Students will learn a variety of field sampling methods for water quality and aquatic plant and animal populations. The final week will be devoted to independent research projects on some aspect of freshwater ecology. Students will present their results to the class and prepare a written report. Other assignments will include reports on group projects lead by the instructor. An exam will be given at the end of the second week to evaluate the students' comprehension of the material. The field work will be done from a field camp at Dollar Lake Provincial Park, and the laboratory work will be done at the university. An extra fee will be charged to cover the costs of transportation, food and camping.

FORMAT: Field intensive

PREREQUISITES: 2001.03 or 2002.03 and 2060.03

BIOL 4060.03: 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. Students will use information on the biology of marine mammals to explore conservation/management issues.

INSTRUCTOR: H. Whitehead

FORMAT: Lectures 3 hours

PREREQUISITE: BIOL 2060.03

CROSS-LISTING: BIOL 5651.03

B. Chemistry

CHEM 1000.06: The Chemical World.

This class is mainly for BA 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.

INSTRUCTOR: T.S. Cameron

CHEM 1011.03/1012.03: General Chemistry I and II.

These classes are standard first-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: A. Chatt, T.B. Grindley, R.D. Guy, R. Stephens, C.H. Warren, P. Wentzell

CHEM 1041.03/1042.03: General Chemistry for the Life and Health Sciences I and II.

The basic content and rigour of these classes is the same as that of CHEM 1011.03/1012.03. 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. Additional areas such as enzyme kinetics, isotopes in medicine, and several types of bio-analyses are introduced in short and simple form. Some chapters take note of the material covered in other prominent first-year classes, particularly in biology and psychology. Requisite high school chemistry (NS grade XI/XII) may be reviewed in tutorial but is not retaught in lecture. CHEM 1041.03/1042.03 uses the same textbook and laboratory experiments as CHEM 1011.03/1012.03 and serves as a regular prerequisite for all 2000 level Chemistry classes.

INSTRUCTOR: W.A. Aue

PREREQUISITE: NS Grade XII Chemistry (441) or equivalent

CHEM 1410.03: Introductory Chemistry.

A descriptive introduction to chemistry with emphasis on materials related to 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.

INSTRUCTORS: D.L. Hooper, P.D. Pacey

NOTE: This class does not serve as a prerequisite for any other chemistry class.

CHEM 2505.03: Environmental Chemistry I.

The objective of this class is to apply the knowledge acquired in introductory chemistry classes to the description of chemical reactions in the environment. The class will start with the composition of the atmosphere, photochemical reactions in the stratosphere (ozone production and loss) and troposphere (production of smog) and simple models used to describe room air quality. The class will then describe the transfer of gases across the air/water interface and the chemistry of natural waters (hardness, alkalinity), the treatment of both drinking water (chlorination and aeration/coagulation) and waste waters (primary, secondary and tertiary treatment). The class will also introduce the students to some of the classes of chemicals commonly encountered in the environment and describe their impact both on humans and aquatic organisms. The chemicals to be discussed include formaldehyde, chlorinated hydrocarbons, pesticides, PAHs, and heavy metals.

INSTRUCTOR: R.D. Guy

FORMAT: Lecture 3 hours

PREREQUISITE: CHEM 1011.03/1012.03 or equivalent

EXCLUSIONS: Students having received credit for Chemistry 4203.03 are not permitted to register in CHEM 2505.03

CHEM 3402.03: 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 CHEM 2401.03/2402.03, as evidenced by a grade of at least C.

CHEM 4203.03: 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 (Mathcad) 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.

INSTRUCTOR: R.D. Guy

C. Economics

ECON 2251.03: An Applied Class In Economic Development and the Environment - Concepts, Policies and Projects

This class is designed around alternative concepts of sustainable development, with emphasis on key theories, experiences and issues of relevance to developing countries and less prosperous regions of industrial countries - including Atlantic Canada. In addition to reading and written work, this class extensively draws upon case study approaches to learning - both within and outside the university setting. There are three conceptual levels: (1) Principles and tensions behind sustainable development; (2) International, national and regional policy and planning approaches re: sustainable development; (3) Projects for sustainable development. **PROFESSOR'S SIGNATURE REQUIRED.**

FORMAT: Lecture, case work with group presentations, tutorials, 3 hours

PREREQUISITES: Introductory Economics

ECON 2252.03: An Applied Class In the Economic Development of Communities and the Environment.

This class follows Economics 2251.03 and (building further on concepts of sustainable development as they particularly apply to developing countries and less prosperous regions of industrial countries) provides participants with field work experience at the community development level. Students have an opportunity to work on projects hinged to governments, business and/or non-governmental organizations. **PROFESSOR'S SIGNATURE REQUIRED.**

FORMAT: Lecture, case studies and field work with group presentations and an end term conference, 3 hours and group tutorials

ECON 3332.03: 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.

PREREQUISITE: ECON 1101.03, 1102.03 and 2200.03

ECON 3335.03: Environmental Economics.

This class serves as an introduction to environmental economics. Topics include social decision making, externalities and public goods, regulatory approaches (standards, charges, tradable permits), forms of value derived from the environment and measurement techniques.

FORMAT: Lecture 3 hours

PREREQUISITES: ECON 1101.03, 1102.03, 2200.03

ECON 3350.03: 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.

PREREQUISITES: ECON 1101.03, 1102.03, 2200.03; MATH 1060.03

D. Earth Sciences

ERTH 1000.06: 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 EARTH 1000.06 should consult the undergraduate advisor.

INSTRUCTOR: J. Hall

FORMAT: Lecture/field trip/ lab

EXCLUSION: Credit will be given for only one of EARTH 1000.06, 1040.03/1050.03, or 1040.03/1001.03.

ERTH 1040.03/1050.03: The Earth and Society.

These classes are designed for non-Earth Sciences majors. Previous Mathematics, Physics, or Chemistry are not required. They do not include formal labs, but 1040.03 includes three field trips, and some assignments are done in a laboratory environment. There may be some variation in topics depending on instructor.

ERTH 1040.03 introduces basic concepts about the Earth and principles of Earth Science including those directly applicable to environmental science (applications mainly covered in 1050.03): the Earth as a planet, geological time, global change, stratigraphy, and surficial geology. Emphasis is also given to the main kinds of rocks (igneous, sedimentary and metamorphic), minerals, the folding and faulting of rocks inside the Earth, and surface processes such as development of landforms, glaciation, soils, rivers & floods, deserts and coastline development. Field trips to excellent exposures in Nova Scotia illustrate different basic rock types and the effects of deep and surface processes active in its geologic history. Students are taught to read the succession of past environments from the rock record.

ERTH 1050.03 begins with the unifying concepts of plate tectonics and then applies principles of Earth Science learned in 1040.03 to problems in environmental, resource geology and geological hazards, for example mineral and petroleum resources (including environmental problems associated with their recovery and use), waste disposal, the carbon cycle, history and causes of climate change, fossils and extinctions, coastal subsidence, volcanic and earthquake hazards, the catastrophic effects of meteorite impacts,

etc. A large proportion of class time is spent on environmental applications of geology, including some special readings and discussion on current problems.

ERTH 1040.03 is a prerequisite for EARTH 1050.03. Students with good grades in EARTH 1040.0 may enter EARTH 1001.03.

INSTRUCTORS: D.I. Godfrey-Smith, J. Hall, P.J.C. Ryall, M. Zentilli

FORMAT: Lecture/Field Trips on 3 Sundays

EXCLUSION: Credit will be given for only one of EARTH 1000.06, 1040.03/1050.03, or 1040.03/1001.03

ERTH 2203.03: Sediments and Sedimentary Rocks.

This class deals with physical and biological processes which generate modern siliclastic, 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. Gibling

FORMAT: Lecture 3 hours/lab 3 hours

PREREQUISITE: EARTH 1000.06 or EARTH 1040.03/1001.03

ERTH 2204.03: Life Through Time.

This class serves two audiences: it is an introduction to paleontology and also a "general education" to introduce non-geology-specialists to past life. The class will deal with two dozen major events in the history of life. Topics include the origin of life, sex and nuclei, leaving the water, paleoclimate and diversity, reptiles and thermoregulation, the evolution of flight, why flowers are beautiful, the end of the dinosaurs, and evolving toward humans. Laboratory time will involve survey of animal phyla, exercises in paleoecology and paleogeography, and oral presentations by seminars and posters.

INSTRUCTOR: D. Scott

FORMAT: Lecture 3 hours/lab 3 hours

PREREQUISITES: EARTH 2203.03 or EARTH 1040.03/BIOLOG 1000.06

ERTH 2410.03: 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 water plays in its various guises. This class is not recommended for earth sciences honours/major students who should take EARTH 3410.03.

INSTRUCTORS: P. Reynolds

FORMAT: Lecture/lab 3 hours, one evening per week

PREREQUISITE: EARTH 1000.06 or EARTH 1040.03/1050.03 or 1001.03

ERTH 3400.03: 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: EARTH 2101.03, 2102.03, 2203.03

ERTH 3410.03: Enhanced Environmental Geology.

The topics treated in this class are similar to those of EARTH 2410.03. However, the class is designed specifically for students with a strong background in geology; equivalent to that of a third-year Earth Science 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 class. For example, participants have researched the environmental implications associated with the various geologic options that have been considered for the permanent storage of high-level nuclear waste. Laboratory exercises emphasize the application of geographic information systems (GIS) to environmental decision-making processes.

INSTRUCTOR: G.K. Muecke

FORMAT: Lecture 3 hours/lab 3 hours

PREREQUISITE: EARTH 3400.03, 2101.03/2102.03, 3500.03

ERTH 3500.03: Geoscience Information Management.

Earth science professionals need to be conversant with microcomputer technologies that involve the acquisition, storage, processing, and analysis of digital geoscience data. In this course we consider the manipulation of numerical, text-based, spatially referenced (cartographic), and image-based (aerial photos, satellite imagery) data sets. The theory and applications of relational databases, global positioning systems (GPS), and both raster and vector geographic information systems (GIS) in the geosciences will be discussed. The integration of systems (ex. GIS with GPS and databases) will also be investigated. Laboratory projects based on geological and environmental problems and data sets form an integral part of the class. Participants are expected to have a basic familiarity with the MS-DOS and WINDOWS operating systems.

INSTRUCTOR: G. K. Muecke

FORMAT: Lecture 3 hours/lab 3 hours

PREREQUISITE: EARTH 1000.06 or 1040.03/1050.03, 2110.03, 2101.03, 2102.03, 2203.03

ERTH 4520.03: GIS Applications to Environmental and Geological Sciences.

Geographic information systems (GIS) provide a rich set of new tools to the geologist and environmental scientist, not only to solve conventional problems, but also to explore questions not readily answered by other means. This class builds on the fundamentals of GIS taught in EARTH 3500.03 to explore analytical tools that aid in decision-making processes encountered in mineral exploration, hydrogeology, site selection, environmental assessment, and global change analysis. The class concentrates on case studies and problem solving, including those requiring multi-criteria and multi-objective decision making processes.

INSTRUCTOR: G.K. Muecke

PREREQUISITE: EARTH 3500.03, STAT 1060.03

E. Oceanography

OCEA 2850.06: 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 this ecological system. Designed to give a background or 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

RESTRICTION: Restricted to second year, or more advanced students

OCEA 3000.03: The Atmosphere.

The purpose of this class is to provide understanding of the basic physical and chemical processes determining the evolution, behaviour and anthropogenic modification of the atmosphere. Topics include: (a) formation and evolution of the atmosphere, chemical composition, recent anthropogenic changes, greenhouse gases, stratospheric ozone; (b) atmospheric motions, mesoscale and large scale dynamics, general circulation, numerical weather prediction and general circulation models; (c) solar radiation as a source of atmospheric motions, terrestrial radiation, energy balance, scattering and absorption of radiation in the atmosphere, elements of radiative transfer; (d) hydrological cycle, thermodynamics of water vapor, phase transitions, role of aerosols and clouds, precipitation; and (e) climate models, past climate, global change, anthropogenic effects.

INSTRUCTOR: I. Folkins
PREREQUISITES: MATH 1000.03/1010.03 or equivalent and PHYC 1000.06 or 1100.06 or equivalent
CROSS-LISTING: PHYC 2700.03

OCEA 3170.03: Physics and Chemistry of the Ocean.

This class outlines concepts in physical and chemical oceanography with special emphasis on the ocean's role in the global biogeochemical and physical/climate systems. This class is in two parts. In the first part, topics include: the oceans as a physical system, water properties, basic dynamical concepts, the forces creating oceanic motion, ocean circulation, shelf and coastal processes. In the second part topics include: the oceans as a chemical system, composition of sea water, control of pH and redox potential, nutrient chemistry, trace elements, organic materials, distributions and geochemical cycles.

INSTRUCTORS: D. Kelley, W. Miller
FORMAT: Lecture 3 hours
PREREQUISITES: MATH 1000.03/1010.03, plus first-year chemistry, or equivalent or permission of the instructor.
RESTRICTION: Restricted to third and fourth-year students.

OCEA 3420.03: Geochemistry of Aquatic Environments.

Given the abundance of water at the earth's surface and the wide use both humans and other organisms make of aqueous environments, it becomes imperative for environmentally-oriented scientists to understand the chemistry of natural bodies of water. In particular, we need to comprehend the processes that lead to the observed composition of groundwaters, lakes, rivers and oceans. We also need to be aware of how man's activities can alter these natural systems. Water is also an agent for geologic and environmental change, both on short and long time-scales. Earth and environmental scientists should have an appreciation of these processes (sources, sinks and transport mechanisms) and the resulting geological cycles. This class is an introduction to the governing principles and processes of aquatic geochemistry. Specific topics will include physical chemistry of natural waters, kinetics (mechanisms & rates) of geochemical reactions, the hydrologic cycle, the dissolved carbonate system and pH controls, redox reactions and the influence of life, rainwater and acid rain, weathering and the formation of soils, mineral-solution equilibria, controls on the composition of rivers, lakes and oceans, sediments and their after-burial changes, and the global cycles of carbon, nitrogen, and sulfur. Students will be taught to approach problems quantitatively through the principles of mass action (Eh-pH and activity-activity diagrams) and of mass balance (box models and conservation equations).

INSTRUCTOR: B. Boudreau
FORMAT: Lecture 3 hours
PREREQUISITES: CHEM 1011.03/1012.03 (or equivalent) and EARTH 1000.06
CROSS-LISTING: EARTH 3420.03

OCEA 4120.03: Introductory Physical Oceanography.

This class explores 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, 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. This class takes a quantitative approach in which equations describing the fluid motions and phenomena are derived, analyzed, and discussed. Quantitative problem-solving is emphasized in assignments. Those desiring a more qualitative approach are urged to consider OCEA 3170.03.

INSTRUCTOR: B. Ruddick
FORMAT: Lecture 3 hours
PREREQUISITE: MATH 1000.03, MATH 1010.03, classic calculus or equivalent, and permission of the instructor
RESTRICTION: Third- and fourth-year students only

OCEA 4130.03: Introductory Chemical Oceanography.

This class covers the major and minor constituents of sea water, the controls on its chemical composition, nutrient cycling, gas exchange and the influence of the oceans on atmospheric chemistry. 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
PREREQUISITE: Instructor's consent
CROSS-LISTING: OCEA 5130.03

OCEA 4311.03: Fluid Dynamics.

An introduction to the theory of fluid dynamics, with some emphasis on geophysically important aspects. Contents: tensor mathematics, flow kinematics, equations of motion, viscous flow, potential flow, convection, turbulence, and basic aerodynamics. Occasional reference will be made to current research topics, especially those in Physical Oceanography.

INSTRUCTOR: D. Kelley
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 4311.03, PHYC 5311.03, OCEA 5311.03

***OCEA 4411.03/4412.03: Dynamic Meteorology I and 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.

INSTRUCTOR: Q. Fu/H. Ritchie
CROSS-LISTING: PHYC 4411.03/4412.03

***OCEA 4530.03: 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.

INSTRUCTOR: P. Chylek, Q. Fu
CROSS-LISTING: PHYC 4530.03

F. Science, Interdisciplinary

SCIE 1000.06: Introduction to Environmental Studies.

The intention of this full-credit class 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 class content consists of introductory material on basic sciences (biology, earth sciences, atmospheric science and oceanography) and follows with sections on the basic social and

health sciences (environmental health, economics, philosophy, politics and law). The class is multi-disciplinary, with both specialists and guest lecturers dealing with issues which reflect their particular expertise and experience. Four aspects of environmental studies underlie much of the class content: (1) Anthropogenic (human induced) environmental effects; (2) Sustainability and the use of renewable and non-renewable resources; (3) Environmental degradation caused by ecological disturbance and pollution; and (4) The interaction of the ecosystem approach to development with other approaches.

The class stresses the connections among specific disciplines of both the lecturers and the students. There are two lectures per week, plus 8 tutorials on environmentally relevant topics. Tutorial assignments count for about 35% of the grade, 6 quizzes for 35%, an individual term project for 20%, and an examination at the end of the A term for 10%.

INSTRUCTORS: O. Hertzman, staff

G. Statistics

STAT 2080.03: Statistical Methods for Data Analysis and Inference.

The usual sequel to STAT 1060.03 or STAT 2060.03. 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 class. Students will design and carry out a simple experiment as part of this class. A natural sequel for this class is STAT 3340.03.

FORMAT: Lecture 3 hours, MLC

PREREQUISITE: STAT 1060.03 or STAT 2060.03

CROSS-LISTING: MATH 2080.03, ECON 2280.03

French

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Dean

Taylor, G.D., BA, PhD (Penn)

Chair

DeMéo, P. (494-2425)

Undergraduate Advisors

DeMéo, P. (494-2425)
Oore, I. (494-2430), Honours
Gordon, T. (494-2430), Majors

Professors Emeriti

Chavy, P., Agrégé des Lettres (Paris), Chevalier de la Légion d'Honneur
Kocourek, R., State Examination, PhD, CSc (Charles U., Prague),
Knight of the Order of Academic Palms

Professors

Bednarski, B., BA (London), MA (Dal), PhD (Laval)
Bishop, M., BA, BEd (Manchester), MA (Manitoba), PhD (Kent,
Canterbury), McCulloch Professor in French
De Méo, P., BA, MA, PhD (UCLA)
Gordon, W.T., BA, MA, PhD (Tor)
Oore, I.Z., BA (Tel-Aviv), MA (Waterloo), PhD (Western)
Waterson, K., BA (Long Island), MA (NYU), PhD (CUNY)

Associate Professors

Bonnel, R.G., Licence (Paris), MA (Essex), Dr. de 3e cycle (Paris)
Trèves, N., BSc (American U., Cairo), PhD (Rice)

Assistant Professor

Mopoho, R., BA (Yaounde, Cameroon), MA, PhD (Montreal)

Lecturer

Mitchell, P.A., AKC (King's College, London), BA (London), MA (Dal)

I. Introduction

The Department of French offers students not only the opportunity to develop fluency in classes backed up by 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 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 an historical period.

The Department of French urges students to practise the language as much as possible. The *Maison Française* is a house 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. 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 and PhD degrees may be pursued in the Department (see the Calendar for Faculty of Graduate Studies).

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 credit at Dalhousie. Scholarships are available for students selected to participate in the Dalhousie/ Aix-en-Provence Year-Abroad Programme.

The language requirement exemption test in French will be given in the April examination period. Students who would like to write this test should register at 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 Professor DeMéo.

II. Degree Programmes

Requirements for the three degree programmes are set out in the following sections. Electives from other departments, when chosen with care, can enrich and enhance the major classes. Departmental Advisors can provide a list of recommended electives. PLEASE PLAN YOUR PROGRAMME WITH AN ADVISOR FROM THE FRENCH DEPARTMENT.

Students particularly interested in LINGUISTICS should consult the list of classes in the Linguistics section of this calendar.

A. 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 the *Maison Française* 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.

1. Concentrated Honours

Departmental Requirements

2000 level

- FREN 2045.06
- FREN 2201.03
- FREN 2202.03

3000 level

- FREN 3020.06
- FREN 3045.06
- One full credit in literature and/or culture

4000 level

- FREN 4045.06 or 4015.06
- Two 4000 level full credits
- At least two other full credits 2000 to 4000 level for a total of nine French credits.

Second year (i.e. 2000 level) classes taken during the student's first year at Dalhousie may count towards major or honours, with the approval of the department. See a departmental advisor.

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).

2. 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: 2045.06, 2201.03, 2202.03, 3045.06, 4045.06 or 4015.06 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).

3. Honours Conversion

The Honours Conversion 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 conversion are similar to those for the concentrated honours programme, but will vary according to individual circumstances.

B. BA with Advanced Major in French

Students who may not be eligible for the Honours Programme are encouraged to enter the Advanced Major degree programme in French.

Departmental requirements

2000 level

- FREN 2045.06
- FREN 2201.03
- FREN 2202.03

3000 level

- FREN 3045.06
- Two other 3000 level full credits in French

4000 level

- FREN 4045.06 or 4015.06
- One 4000 level full credit in French

PLEASE NOTE: 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 3020.06 (required for Honours), and consult the Chair or the Honours Advisor.

Students wishing to do an Advanced Double Major must take, at the minimum, FREN 2045.06, 2201.03, 2202.03, 3045.06 plus one full credit at the 3000-level.

C. BA with Major in French

Students should consult the Chair or a Department Advisor about the choice of classes.

Students are urged to take more than the minimum number of classes required, and, indeed, to do a 4-year degree (Advanced Major or Honours) if a high level of proficiency in French is sought.

Departmental Requirements

2000 level

- FREN 2045.06
- FREN 2201.03
- FREN 2202.03

3000 level

- FREN 3045.06
- One other 3000 level full credit in French

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.

Level on Entry	1st Year	2nd Year	3rd Year	4th Year
1	1000.06 (3 + 2 hrs + lab)	1010.06 (3 + 1 hrs + lab)	2045.06* or any other 2nd year class	3045.06* or any other 3rd year class
2a	1005.06 (3 hrs + lab)	1010.06 (3 + 1 hrs + lab)	2045.06* or any other 2nd year class	3045.06* or any other 3rd year class
2b	1006.06/ 1011.06 (6 hrs + lab)	2045.06* or any other 2nd year class	3045.06* or any other 3rd year class	4045.06* or any other 3rd or 4th year class
3a	1010.06 (3 + 1 hrs + lab)	2045.06* or any other 2nd year class	3045.06* or any other 3rd year class	4045.06* or any other 3rd or 4th year class
3b	1006.06/ 1011.06 (6 hrs + lab)	2045.06* or any other 2nd year class	3045.06* or any other 3rd year class	4045.06* or any other 3rd or 4th year class
4	1045.06 (3 hrs + lab)	2045.06* or any other 2nd year class	3045.06* or any other 3rd year class	4045.06* or any other 3rd or 4th year class
5	2045.06* or any other 2nd year class	3045.06* or any other 3rd year class	4045.06* or any other 3rd or 4th year class	

* Required for major, advanced major and honours.

Definition of Levels

1. If you have NEVER studied French before, take FREN 1000.06. If you wish to continue after completing FREN 1006.06, you may take FREN 1010.06 during the summer or the following year.
- 2a. If you studied French for a few years, some time ago (for example, up to Grade 9), take FREN 1005.06. If you wish to continue after completing FREN 1005.06, you may take FREN 1010.06 during the summer or the following year.
- 2b. A fast-track option, FREN 1006.06/1011.06 offers students the opportunity to complete the work of both FREN 1005.06 and FREN 1010.06 (normally a two year programme) in one academic year and to enrol in second year level classes the following year.
- 3a. If you studied French during part of your high school years, you may take either FREN 1005.06 (if you feel you need a complete review), or FREN 1010.06 (if you remember your high school French reasonably well). Successful completion of FREN 1010.06 allows access to second year level classes.
- 3b. Fast-track option (see 2b above).

- 4 If you studied Core French throughout high school and are familiar with the basic structures of French (even if you are not in full control of them), take FREN 1045.06.
- 5 If you took French immersion during your high school years, you may be able to take second year level classes in your first year. You may choose freely among second year classes, all of which assume the same ability level. If, however, you believe that you need to go back over the basics of French, take FREN 1045.06.

III. Classes Offered

PLACEMENT TEST: You must take the French Placement test prior to selecting your first French class at Dalhousie. The test is available on the World Wide Web at <http://www.dal.ca/frenwww/placement.htm>. The decision of the Chairperson regarding placement is final.

NOTE: Classes marked * may not be offered every year. Please consult the current timetable to determine this year's class offerings.

FREN 1000.06: Français pour débutants/ Beginners' French.

For students with no previous background in French or whose placement test results (see above) indicate this as the most appropriate class. Introduction to the basic structures of the language combined with practical vocabulary for oral and written communication. This class aims to develop all 4 skills (listening, speaking, reading, writing) by integrating grammar study, oral and written exercises/activities, and situational contexts. Teaching methods and texts will vary from year to year and instructor to instructor. All classes are interactive and a high degree of participation is expected. Many self-study learning materials are used to complement class instruction. This class is normally followed by FREN 1010.06.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours, tutorial 2 hours, language lab 3 hours

EXCLUSIONS: FREN 1005.06, 1006.06

FREN 1005.06: Français fondamental niveau I/Basic French level I.

This is the same class as FREN 1000.06, but designed for students having studied French up through grade 8-9, or whose placement test results (see above) indicate this as the most appropriate class. For a more complete description of this class, see FREN 1000.06 above. While texts and methods may vary from section to section, all classes are interactive and a high degree of participation is expected. Many self-study learning materials are used to complement classroom instruction. FREN 1005.06 is normally followed by FREN 1010.06.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours, language lab 3 hours

EXCLUSIONS: FREN 1000.06, 1001.06, 1006.06

FREN 1010.06: Français fondamental niveau II/Basic French level II.

For students with up to Grade 10-11 French, Grade 12 French more than two years ago, or whose placement test results (see above) indicate this as the most appropriate class. Brief review of structures and vocabulary presented in FREN 1000.06/1005.06 followed by introduction to more advanced structures (compound tenses, moods, etc.). All 4 skills are further developed, with reading and writing assignments focusing particularly on correct expression. A tutorial supplements classroom work. Successful completion of this class leads to all second-year classes.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours, tutorial 1 hour, language lab 3 hours

PREREQUISITE: FREN 1000.06, 1005.06, 1006.06

EXCLUSION: FREN 1011.06, 1045.06, 2000.06

FREN 1006.06A/FREN 1011.06: Français fondamental niveaux I & II/Basic French levels I & II.

These classes complete the work of FREN 1000.06/1005.06 plus FREN 1010.06 in one academic year, thus allowing students to enrol in second-year classes the following year. For a more complete

description of these classes, see listings for FREN 1000.06/1005.06 and FREN 1010.06 above. Two full university credits are awarded, though neither will be counted towards a major in French. This class is not normally suitable for true beginners.

INSTRUCTOR: Staff

FORMAT: Lecture 6 hours, language lab 6 hours

EXCLUSION: FREN 1000.06, 1005.06 (for FREN 1006.06), 1010.06, 1045.06 (for FREN 1011.06)

FREN 1045.06: Introduction au français à l'université/Introduction to university French.

This class is designed for students having studied French through Grade 12 (academic core) or whose placement test results (see above) indicate this as the most appropriate class. It reviews all basic grammar and further develops all 4 skills (listening, speaking, reading, writing), with a somewhat greater emphasis on reading and writing. Readings of several types of texts and writing assignments focus on correct expression. Regular listening comprehension assignments are done in the learning laboratory outside of class time. Successful completion of this class leads to all second-year classes.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours, language lab 2-3 hours

EXCLUSIONS: FREN 1010.06, 1011.06, 1020.06, 1040.06

FREN 1060.06: 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 1060.06 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 1010.06 or FREN 1045.06. This class satisfies the Bachelor of Arts Language Requirement.

INSTRUCTORS: W.T. Gordon and K. Waterson

FORMAT: Lecture 3 hours

NOTE: All classes above this level are given entirely in French.

FREN 2021.03/FREN 2022.03: Études pratiques/Practice in Language Skills.

Follows FREN 1010.06 1011.06 or 1045.06. It is normally taken in the second year of study and provides the opportunity to practice and improve language skills already acquired. Each year sections are chosen from among the 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 2021.03 and 2022.03. Approved with Canadian Studies, in part.

Topic 01: Le Journalisme: I. Oore

Topic 02: La Société française à travers la littérature: R. Bonnel

Topic 03: La Civilisation francophone de l'Afrique occidentale et des Antilles: M. Bishop

Topic 04: Etudes acadiennes I: H. Runte

Topic 05: Monuments culturels de Paris: Staff

Topic 06: Aspects visuels de la culture française: J. Brown

Topic 07: La Guerre des ondes: W.T. Gordon

Topic 08: La France et ses photographes: K. Waterson

Topic 09: Québécois et Québécoises célèbres: B. Bednarski

Topic 10: Aspects du Canada contemporain: E. Gesner

Topic 11: Ecritures féminines I: N. Trèves

Topic 12: L'Art en France depuis la Révolution: M. Bishop

Topic 13: Voyages culturels à travers la France: Staff

Topic 14: Etudes acadiennes II: H. Runte

Topic 15: Publicités télévisées: J. Brown
Topic 16: Aspects de la France contemporaine: E. Gesner
Topic 17: Pour comprendre les médias: W.T. Gordon
Topic 18: Le Québec à travers les textes: I. Oore
Topic 19: Écritures féminines II: N. Trèves
Topic 20: Le roman policier: P. De Méo
INSTRUCTOR: As above
FORMAT: Lecture 3 hours

***FREN 2032.03: 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. Honours students and majors, especially those whose first language is not French, should seriously consider including FREN 2032.03 and FREN 2033.03 in their programme.

INSTRUCTOR: K. Waterson

FORMAT: Varied participatory activities, short lectures, language lab

PREREQUISITE: FREN 1010.06, 1045.06 or instructor's consent

***FREN 2033.03: La phonologie II/Phonology II.**

This class continues, with an increased emphasis on self-expression and communicative ability, the work of French 2032.03.

INSTRUCTOR: K. Waterson

FORMAT: Varied participatory activities, short lectures, language lab

PREREQUISITE: FREN 2032.03 or instructor's consent

FREN 2045.06: Grammaire intensive/intensive Grammar.

A detailed study of grammar through an analysis of the components of the sentence leading to paragraph and text analysis. Emphasis is placed on the correspondence between grammatical content and meaning. Numerous exercises will aim at developing the ability to communicate in clear, accurate written French.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PREREQUISITE: FREN 1010.06, 1045.06, or equivalent

EXCLUSION: FREN 1040.06

FREN 2201.03/FREN 2202.03: 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 2201.03 and FREN 2202.03 may be taken consecutively. Classes involve, principally, group discussion, and lecture.

INSTRUCTORS: Staff

FORMAT: Lecture 3 hours

***FREN 2203.03: Approches du texte littéraire/ Approches 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. Strongly recommended for French majors and honours students. Approved with Canadian Studies.

INSTRUCTOR: I. Oore

FORMAT: Lecture/discussion 3 hours

PREREQUISITE: FREN 1010.06, 1011.06 or 1045.06

***FREN 3000.03: 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

FREN 3020.06: 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: Staff

FORMAT: Lecture 3 hours

PREREQUISITE: 2000-level French class

***FREN 3025.03: 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. Approved with Canadian Studies.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PREREQUISITE: Corequisite or permission of instructor

Corequisite: FREN 3020.06

FREN 3026.03: Le français québécois/ Quebec French

Definition, origin and evolution of the French of Quebec. Study of its phonetic, lexical, morphosyntactic and semantic characteristics. Comparison with Canadian French outside of Quebec and with international French. Analysis of written and oral documents for the purpose of illustration.

INSTRUCTOR: R. Mopoho

FORMAT: Lecture 3 hours

COREQUISITE: FREN 3020.06 or permission of instructor

FREN 3045.06: Stylistique I/Written expression I.

Practice in style and manner of expression based on the study of texts. Various exercises - including dictations, translations, compositions - are used to develop further vocabulary acquisition, grammatical accuracy, sentence construction and variety of expression.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PREREQUISITE: FREN 2045.06 or equivalent

EXCLUSION: FREN 2040.06

FREN 3100.06: 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.

INSTRUCTOR: Staff

FORMAT: Lecture/discussion 3 hours

PREREQUISITE: 2000-level French class

***FREN 3150.03: Aspects de la francophonie/Aspects of the Francophone World**

Introduction to the study of the francophone world: political, economic, linguistic, literary and cultural aspects. From year to year the class might emphasize different regions: Western Countries, Sub-Saharan Africa, Pacific Islands, West Indies, Northern Africa.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PREREQUISITE: 2000-level class or consent of instructor

***FREN 3250.03: 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 2201.03/2202.03

CROSS-LISTING: WOST 3250.03

***FREN 3300.03: La littérature médiévale/ Mediaeval 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: Staff

FORMAT: Lecture/discussion 3 hours

PREREQUISITE: FREN 2201.03/2202.03

***FREN 3400.03: 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 2201.03/2202.03

***FREN 3500.03: La littérature du dix-septième siècle/17th-Century French Literature.**

This class offers an introduction to seventeenth century French literature with a primary focus on representative works by three major 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 2201.03/2202.03

***FREN 3600.03: 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 2201.03/2202.03

***FREN 3700.03: 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: Staff

FORMAT: Lecture/discussion 3 hours

PREREQUISITE: FREN 2201.03/2202.03

***FREN 3800.03: 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 2201.03/2202.03

***FREN 3810.03: 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 Chouas. 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 2201.03/2202.03

FREN 3900.03/FREN 3901.03: 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 3900.03: Poetry, FREN 3901.03: Novel) and choice of genre may differ from year to year. Approved with Canadian Studies.

INSTRUCTORS: B. Bednarski, I. Oore

FORMAT: Lecture/discussion 3 hours

PREREQUISITES: FREN 2201.03/2202.03

***FREN 3910.03: 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 2021.03/2022.03). Approved with Canadian Studies.

INSTRUCTOR: Staff

FORMAT: Lecture/discussion 3 hours

PREREQUISITE: FREN 2201.03/2202.03

***FREN 4001.03: Histoire du français - Moyen Age/History of French - The Middle Ages.**

Advanced research into selected topics in Old and Middle French - manuscript studies; paligraphy; historical phonetics, morphology and syntax; the cultural-literary context of linguistic development; etc.

INSTRUCTOR: Staff

FORMAT: Seminar 2 hours

PREREQUISITE: 3000-level French class

***FREN 4002.03: 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: Staff

FORMAT: Seminar 2 hours

PREREQUISITE: 3000-level French class

***FREN 4011.03: 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: Staff

FORMAT: Seminar 2 hours

PREREQUISITE: FREN 3020.06

***FREN 4013.03: Pragmatique/Pragmatics**

Introduction to the study of linguistic pragmatics: definitions, principles and methods. Analysis of the conditions of language use, with particular emphasis on the description of speech acts. Elements of literary pragmatics. Application exercises.

INSTRUCTOR: R. Mopoho

FORMAT: Lecture 2 hours

PREREQUISITE: FREN 3020.06 or consent of instructor

***FREN 4014.03: Langue et société: Language and Society**

A linguistic introduction to the analysis of the relationship between language and society. Typology of sociolinguistic situations. The phenomena of language contact, linguistic variation, norms. The relationship between groups in multi-lingual situations. Principal theoretical tendencies. Practical applications.

INSTRUCTOR: R. Mopoho

FORMAT: Lecture 2 hours

PREREQUISITE: FREN 3020.06 or consent of instructor

***FREN 4015.06: 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 2 hours

PREREQUISITE: At least on full credit in French language or literature at the 2000 level or above

***FREN 4045.06: Stylistique II/Written expression II.**

This class develops further the skills acquired in FREN 3045.06. The study of several types of texts develops an awareness of various forms of written expression. Exercises develop the ability to perform a number of tasks: writing summaries, reports, letters, literary analysis etc.

INSTRUCTOR: Staff

FORMAT: Lecture 2 hours

PREREQUISITE: FREN 3045.06 or equivalent

EXCLUSION: FREN 3040.06

***FREN 4300.03: Le roman courtois/Courtly Novels.**

A close literary analysis of mediaeval French Arthurian romances. Texts in bilingual (Old French/French) editions.

INSTRUCTOR: Staff

FORMAT: Seminar 2 hours

PREREQUISITE: 3000-level French literature class

***FREN 4301.03: 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: Staff

FORMAT: Seminar 2 hours

PREREQUISITE: 3000-level French literature class

***FREN 4401.03: 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 2 hours

PREREQUISITE: 3000-level French literature class

***FREN 4500.03: 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

***FREN 4600.03: 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 2 hours

PREREQUISITE: 3000-level French literature class

***FREN 4700.03: 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: P. De Meo

FORMAT: Seminar 2 hours

PREREQUISITE: 3000-level French literature class

***FREN 4701.03: 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: P. DeMeo

FORMAT: Seminar 2 hours

PREREQUISITE: 3000-level French literature class

***FREN 4710.03: 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 Desnos.

INSTRUCTOR: M. Bishop

FORMAT: Seminar 2 hours

PREREQUISITE: 3000-level French literature class

***FREN 4801.03: 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 2 hours

PREREQUISITE: 3000-level French literature class

***FREN 4811.03: 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, Préaud, Senghor, Tchicaya, Césaire, Glissant, Miron and others.

INSTRUCTOR: M. Bishop

FORMAT: Seminar 2 hours

PREREQUISITE: 3000-level French literature class

***FREN 4902.03/FREN 4903.03: Écrivains québécois contemporains/ Contemporary Québec Writers.**

In depth study of one or more contemporary Québec writers.

Approved with Canadian Studies.

INSTRUCTORS: B. Bednarski/I. Oore

FORMAT: Seminar 2 hours

PREREQUISITE: 3000-level French literature class

***FREN 4904.03: Écrivaines québécoises/ Quebec 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. Approved with Canadian Studies.

INSTRUCTORS: B. Bednarski/L. Oore

FORMAT: Lectures/discussion 2 hours

RECOMMENDED: FREN 2201.03/2202.03 and at least one third-year literature class, preferably French Canadian

CROSS-LISTING: WOST 4250.03

FREN 4994.03/FREN 4995.03B, FREN 4996.03/FREN 4997.03B, FREN 4998.03/FREN 4999.03: 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

German

Location: 1355 LeMarchant Street
Halifax NS B3H 3J5
Telephone: (902) 494-2161
Fax: (902) 494-2719

Dean

Taylor, G.D., BA, PhD (Penn)

Chair

Curran, J.V. (494-1091/2161)

Undergraduate Advisor

Curran, J.V. (494-1091/2161)

Professors

Gaede, F.W., PhD (Freib) (McCulloch Professor in German), FRSC
Schwarz, H.G., MA (Munich), PhD (McG)

Associate Professors

Curran, J.V., BA (Hons), MA (Dal), PhD (Newcastle upon Tyne)
Steffen, D.H., PhD (Gott)

Lecturer

Garvey, B.V., BA (Hons), MA (Dal)

I. 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.

II. Degree Programmes

The following programmes are normally followed, other possibilities do exist. Students considering a degree in German are advised to consult with the undergraduate advisor of the Department.

A. BA with Honours in German

1000 level: German 1010.06

2000 level: Seven credits at or above the 2000 level

3000 level: Two credits at the 3000 level or higher, in addition to those listed above

B. 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.

C. BA with Advanced Major in German

1000 level: German 1010.06

2000 level: Three credits at or above the 2000 level

3000 level: Three credits at the 3000 level or higher, in addition to those listed above

D. BA with Major in German

1000 level: German 1010.06

2000 level: Two credits at or above the 2000 level

3000 level: Two credits at the 3000 level or higher, in addition to those listed above

III. Classes Offered

NOTE: Classes marked * are not offered every year. Please consult the current timetable to determine this year's class offerings.

PLEASE NOTE:

- GERM 1010.06 is to be taken by students with no previous knowledge of German.
- GERM 1060.06 is to be taken by students with no previous knowledge of German.
- Students who have completed high school German will normally take GERM 2000.06.

All students with previous knowledge of German should see the Undergraduate Advisor.

GERM 1010.06: German for Beginners.

GERM 1010.06 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.

INSTRUCTORS: Staff

FORMAT: Seminar 3 hours

GERM 1020.06: German Fiction in Novel and Film

This course satisfies the university's guidelines for the Writing Requirement. It examines the conceptual transition from the printed word to the screen; classic German novels and short stories are to be read and compared with their film versions. Works by Kleist, Fontane, Kafka, Thomas Mann, Heinrich Mann, Böll and Handke will be included on the reading list. All texts will be read in English translation. Some of the best known and most innovative cinematic works will be shown and discussed. Directors will include Fassbinder, Herzog, Schlöndorff, Wenders, von Trotta and Visconti. All German language films will either be "dubbed" into English or provided with English subtitles.

INSTRUCTOR: Staff

FORMAT: Writing Requirement, Seminar 3 hours

GERM 1060.06: German Reading Class 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. For purposes of admission to advanced classes in German it is equivalent to GERM 1010.06.

INSTRUCTOR: H.-G. Schwarz

FORMAT: Seminar 3 hours

GERM 1010.06/ 1060.06: 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 GERM 1010.06, 1060.06, high school German Grade 10, 11, 12 or an equivalent basic knowledge. A combination of GERM 2000.06 and GERM 2020.06 serves as an accelerated Intermediate German class and is designed for students who want to make rapid progress in the language.

GERM 2000.06: 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.

INSTRUCTOR: J. Curran

FORMAT: Seminar 3 hours

PREREQUISITE: GERM 1010.06, 1060.06 or equivalent

***GERM 2010.03: Germanic Myths and Tales I.**

The class will begin with the great Germanic epic of the Nibelungen, rediscovered in the eighteenth century. In the nineteenth century, the composer Wagner adopted the stories for his Ring cycle, which will be discussed with musical examples. Finally the case against Wagner, put forward by the philosopher Nietzsche, will complete the readings. The readings will be in German but the language of instruction will be English.

INSTRUCTOR: J. Curran

FORMAT: Seminar 2 hours

PREREQUISITE: GERM 1010.06, 1060.06 or equivalent

***GERM 2011.03: Germanic Myths and Tales II.**

In this class, we will read the famous collection of fairy tales compiled by the Grimm Brothers in the first quarter of the nineteenth century. The class asks why they were so popular at the time and looks at the reason for their seemingly endless appeal since. We will consult and evaluate a wide variety of critical approaches to the material. The reworkings of the tales in other genres will also be discussed. The texts will be read in German but the language of instruction will be English.

INSTRUCTOR: J. Curran

FORMAT: Seminar 2 hours

PREREQUISITE: GERM 1010.06, 1060.06 or equivalent

***GERM 2020.06: 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: GERM 1010.06 or equivalent

GERM 2050.03: German Reading I.

This is a seminar specifically intended for students who do not fit into our normal programme offerings. Please consult departmental advisor.

GERM 2051.03: German Reading II.

This is a seminar specifically intended for students who do not fit into our normal programme offerings. Please consult departmental advisor.

GERM 2060.03: German for Business, Economics and Tourism I.

This class introduces students to the specialized vocabulary used in business and economics. It also aims to familiarize the students with all aspects of the German economy and business world.

FORMAT: Seminar 3 hours

PREREQUISITE: Any of GERM 1010.06, 1060.06 or equivalent

GERM 2061.03: German for Business, Economics and Tourism II.

This class introduces students to the specialized vocabulary used in business and economics. It also aims to familiarize the students with all aspects of the German economy and business world.

FORMAT: Seminar 3 hours

PREREQUISITE: GERM 1010.06, 1060.06 or equivalent

***GERM 2150.06: Goethe's *Faust*.**

A close reading of Goethe's *Faust*, comparing the German original and an English translation, will give rise to questions about translation techniques, the theory of drama and the reshaping of a legend. While Goethe's masterpiece stands at the centre, other German versions of the Faust legend will also be discussed in detail. Assignments will involve research into later echoes of the Faust legend as well. The language of instruction is English but the texts are in German.

INSTRUCTOR: J. Curran

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: GERM 1010.06 or a reading knowledge of German

GERM 2200.06: 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: H.-G. Schwarz

FORMAT: Seminar 2 hours, tutorial 1 hour

PREREQUISITE: GERM 2000.06 or equivalent or a reading knowledge of German

***GERM 2300.06: 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

***GERM 2400.06: 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. The language of instruction is German and English, as needed. The texts are in German.

INSTRUCTOR: H.-G. Schwarz

FORMAT: Seminar 2 hours

PREREQUISITE: GERM 2000.06 or equivalent

***GERM 2450.06: 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. This class is taught in English and uses English translations.

INSTRUCTOR: D. Steffen

FORMAT: Seminar 2 hours

PREREQUISITE: GERM 2000.06 or GERM 2200.06 or King's Foundation Year

***GERM 3000.06: 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: GERM 2000.06 or equivalent

***GERM 3010.03: 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 translation theories, elements of style and questions of ambiguity and textual redundancy.

INSTRUCTOR: J. Curran

FORMAT: Seminar 3 hours

PREREQUISITE: GERM 2000.06 or equivalent

***GERM 3011.03: 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 translation theories, elements of style and questions of ambiguity and textual redundancy.

INSTRUCTOR: J. Curran

FORMAT: Seminar 3 hours

PREREQUISITE: GERM 2000.06 or equivalent

GERM 3051.03: Advanced Reading I.

This is a seminar at the advanced level specifically intended for students who do not fit into our normal programme offerings. Please consult departmental advisor.

INSTRUCTOR: H.G. Schwarz

FORMAT: Seminar 2 hours

PREREQUISITE: Any 2000-level class

GERM 3052.03: Advanced Reading II.

This is a seminar at the advanced level specifically intended for students who do not fit into our normal programme offerings. Please consult departmental advisor.

INSTRUCTOR: H.G. Schwarz

FORMAT: Seminar 2 hours

PREREQUISITE: Any 2000-level class

***GERM 3100.06: 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: GERM 2200.06, GERM 2400.06 or other German literature class at the 2000-level

***GERM 3150.06: 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: GERM 2200.06, GERM 2400.06 or other German literature class at the 2000-level

***GERM 3200.06: Goethe and Romanticism.**

A study of Goethe, Hölderlin, Kleist, and Novalis.

INSTRUCTOR: D. Steffen

FORMAT: Seminar 2 hours

PREREQUISITE: GERM 2200.06, GERM 2400.06 or other German literature class at the 2000-level

***GERM 3240.06: 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: GERM 2200.06, GERM 2400.06 or other German literature class at the 2000-level

***GERM 3250.06: 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: GERM 2200.06, GERM 2400.06 or other German literature class at the 2000-level

***GERM 3650.06: 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: GERM 2200.06 or GERM 2400.06 and another literature class

***GERM 4100.06: Aesthetic Theory.**

An historical study of the development of literary theory.

INSTRUCTOR: F. Gaede

FORMAT: Seminar 2 hours

PREREQUISITE: GERM 2200.06 or GERM 2400.06 and another literature class

***GERM 4200.06: 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: GERM 2200.06, GERM 2400.06 or other German literature class at the 2000-level

***GERM 4250.06: 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.

***GERM 4500.03: Special Topics Class I.**

This is an intensive research seminar dealing with selected topics to be announced.

***GERM 4501.03: Special Topics Class II.**

This is an intensive research seminar dealing with selected topics to be announced.

***GERM 4600.06: Special Topics Class.**

This is an intensive research seminar dealing with selected topics to be announced.

Health Education

See School of Health and Human Performance (pg. 150).

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. Classes may not be offered every year; consult the current timetable.

HLTH 3000.03: An Interdisciplinary Approach to Health Promotion.

This class will offer an opportunity for students to interact with their peers and practitioners in the health field who are pursuing studies in similar and different disciplines and share an interest in health promotion. The concepts and theories that frame the current understanding of Health Promotion will be used to guide the class. The class will have a one and a half hour large group lecture each week followed by a one and a half hour small group tutorial session. The lectures will be offered by representatives of different disciplines and different aspects of community practice.

FORMAT: Lecture 3 hours

PREREQUISITE: Completion of one full year in a health discipline

RESTRICTION: Restricted to Health Profession students or by permission of instructor

HLTH 3001.03: 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: Lecture 2 hours, tutorial 1 hour

PREREQUISITE: Completion of one full year in a health discipline

RESTRICTION: Restricted to Health Professions students or by permission of instructor

HLTH 4900.03: An Interdisciplinary Approach to Gerontology (Social Perspectives).

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: Lecture 3 hours

PREREQUISITE: SOSA 1000.06, 1050.06; 1100.06; or 1200.06

CROSS-LISTING: SOSA 3147.03

HLTH 4910.03: 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, the importance of teamwork effectiveness and to help the learners develop an awareness of the need for the development of a comprehensive and appropriate health care system that meets the needs of older persons.

FORMAT: Lecture 3 hours

PREREQUISITE: Completion of one full year in a health discipline

RESTRICTION: Restricted to Health Professions students who *have completed one full year in a health discipline* or by permission of instructor

Health Services Administration

School of Health Services Administration

Location 5599 Fenwick Street
Halifax, NS B3H 1R2
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E-mail: Health.Services.Administration@Dal.Ca

Dean

McIntyre, L., MD, MHSc, FRCP(C)

Director

Rathwell, T., BA (Hons) (York), MA, PhD (Dunelm)

Professor Emeritus

Ruderman, A P., BS, MA, PhD (Harvard), MBA (Chicago)

Professor

Nestman, L.J., BCom (Sask), CA, MHSA (Alta)

Associate Professor

McIntyre, L., MD, MHSc (Tor), FRCP(C)

Assistant Professors

Johnston, G., BSc(Hons) (McG), MHSA (Alta), PhD (Western)

Lecturers

Boone, G., BN, MPA (Dal)
Cochrane, W., BA(Hons), LLB (Dal)
Davies, M., BSc (MSVU), BEd (UPEI), MHSA (Dal), CHE
Harvie, B., BA (Hons), MHSA (Dal)
Mackin, J., BA (UPEI), MDE, MHSA (pending 1998) (Dal)
Marsh, W., BCom (Dal), MBA (SMU)
McGuire, A., BN (McG), MHSA (Dal)
Menzies, K., CPA, MHSA (Dal)
O'Brien, P., RN, BN, MHSA (Dal)

I. Introduction

The School of Health Services Administration offers a Diploma in Health Services Administration (DHSA) programme which is designed to prepare students for a career in health care at the managerial level. It meets the needs of those currently employed in the health care sector in a managerial capacity, particularly, middle managers in medium and large institutions, administrators in small facilities, and employees in community health, long-term care, primary care, multi-service centres, and community health boards. The programme provides a conceptual background for the increasingly complex managerial tasks performed in health institutions, agencies, and health-related government departments. Every effort is made to balance political, social, economic, cultural, medical, and ethical approaches to understanding the health care delivery system with those of the management sciences. All students must observe the University and Academic Regulations described in the calendar.

A. Modes of Study

Students may complete the DHSA programme through full-time study, part-time study or distance education.

Distance Education Study

Students may complete the DHSA programme through a variety of distance education delivery methods. Further information regarding site locations and class offerings can be obtained from the School.

B. Application Procedure

Applicants must meet the Dalhousie University undergraduate admission requirements to warrant consideration into this programme. Applicants require university preparation (you may not apply from high school). In addition to transcripts, students are required to submit a current resume and at least one letter of reference with their application to the Diploma programme.

Application forms are available from the Office of the Registrar, Dalhousie University. Applications should be submitted as early as possible, and not later than June 1 in the academic year in which studies are to commence.

Students may be considered for advanced standing if they have completed classes equivalent to the required or elective classes. Application for advanced standing must be made in writing after an applicant has been accepted to the programme.

Further information on the Diploma in Health Services Administration programme may be obtained from: School Administrator, School of Health Services Administration, Dalhousie University, 5599 Fenwick Street, Halifax, Nova Scotia, B3H 1R2, (902) 494-7097.

C. Curriculum

The one-year programme features both an academic and results-oriented curriculum. Students accepted into the DHSA programme take the following half-credit classes:

- HEAS 4000.03: Canadian Health Care Delivery System
- HEAS 4200.03: Epidemiology and Health Law
- HEAS 4400.03: Health Care Economics
- HEAS 4001.03: Management Process in Health Services
- HEAS 4002.03: Human and Financial Resource Management
- HEAS 4003.03: Quality Management
- HEAS 4004.03: Health Care Planning
- ECON 1101.03: Principles of Microeconomics
- one credit or two half credit electives as approved by the School

II. Classes Offered

HEAS 4000.03: Canadian Health Care Delivery System.

The class is designed to provide an overview of the health care industry in Canada, and more specifically in Nova Scotia. Aimed specifically at supervisors, middle management, and administrators, the existing trends in health care from a provincial perspective will be reviewed. The goal of this class is to provide the student with a snapshot view of the existing health care system, its past development, and future direction.

INSTRUCTORS: A. McGuire

FORMAT: Lecture, seminar 2 hours

HEAS 4200.03: Epidemiology and Health Law.

The first half of this class is a general, introductory class in the principles of epidemiology. In this class discussion will concentrate on occurrence of disease and injuries in human populations, examine methods of determining the causes of illness and death, and analyze conclusions which have been gained through the application of epidemiological studies. The object of the second half of this class is to give students an overview of law as it relates to health care management. It is designed to make students aware of actual or potential legal problems that they may face at the managerial level.

INSTRUCTORS: W. Cochrane, B. Harvie

FORMAT: Lecture, seminar 2 hours

PREREQUISITE: HEAS 4000.03 or equivalent

HEAS 4400.03: Health Care Economics.

This class is designed to introduce students to an economic perspective of the health care system, and, to encourage them to use economic analysis when evaluating health care issues. This class builds upon the introductory microeconomics class; therefore, but its primary objective is to specifically examine resource allocation decisions in health care markets.

INSTRUCTORS: J. Mackin

FORMAT: Lecture, seminar 2 hours

PREREQUISITE: ECON 1101.03, HEAS 4000.03

HEAS 4001.03: Management Process in Health Services.

This class is aimed at providing a general overview of the structure, process, and environment of health care organizations for supervisors and middle managers. The goal of this class is to facilitate the development of students' administrative insights, problem solving skills, and managerial judgment. Further to this objective, this class seeks to inform students about some of the roles, functions, and values of key actors in contemporary health service organizations.

INSTRUCTOR: W. Marsh

FORMAT: Lecture, seminar 2 hours

HEAS 4002.03: Human and Financial Resource Management.

This class will provide the student with a working knowledge of the day to day operational management of resources. The first half of the class will focus on the human resource component examining issues of labour relations, employment legislation, human rights legislation, team building and performance evaluation. The second half of the class will introduce the student to financial management concepts. Topics covered include preparing, managing, and evaluating department budgets, and fiscal accountability.

INSTRUCTORS: K. Menzies, G. Boone

FORMAT: Lecture, seminar 2 hours

PREREQUISITE: HEAS 4001.03

HEAS 4003.03: Quality Management.

This class will provide an introduction to the concept of quality management in health care. Class content will include the traditional models of quality assurance, risk management and utilization management as they are currently practised in Canadian health care facilities. The concept of Total Quality Management will be utilized to demonstrate how it compares/contrasts with the traditional models.

INSTRUCTOR: P. O'Brien

FORMAT: Lecture, seminar 2 hours

PREREQUISITE: HEAS 4000.03

HEAS 4004.03: Health Care Planning.

This class will use lectures, readings and case discussions to explore national, provincial, regional and institutional health planning initiatives. How these initiatives influence planning and service delivery at the programme level will also be examined.

INSTRUCTORS: M. Davies

FORMAT: Lecture, seminar 2 hours

PREREQUISITE: HEAS 4000.03

Health and Human Performance

School of Health and Human Performance

Location: 6230 South Street
Halifax, NS B3H 3J5
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Dean

McIntyre, L., MD, MHSc, FRCP(C)

Academic Staff

Director

Maloney, T.L., BPE, BEd (Alta), MA (Western), PhD (Alta)

Professor Emeritus

Belzer Jr., E.G., BS (West Chester State Coll), MS (Maryland), PhD (Illinois)

Professors

Holt, L.E., BS, MS (Springfield Col.), PhD (Southern Illinois)

Keddy, B., BScN (MSVU), MA, PhD (Dal), RN, major appointment in the School of Nursing

Lyons, R.F., BA (Dal), MEd (Xavier), PhD (Oregon)

Makrides, L., MCSP, BPT (Sask), MSC (Ottawa), PhD (MCM), Major appointment in school of Physiotherapy

Singleton, J.F., BA (Waterloo), MS (Penn State), PhD (Maryland)

Young, A.J., BS (West Chester State Col), MS, PhD (Maryland)

Associate Professors

Campagna, P.D., BPHE (Windsor), BEd (Queen's), MEd (SUNY), PhD (Alberta)

Elder, G.C.B., DipEdAdv (St. Mary's Col., U London), MEd (Georgia Southern), PhD (McM)

Hood, C.D., BPE (Calgary), MS, PhD (Illinois)

Ipson, N.M., BA, MS, PhD (Brigham Young)

Kemp, N.H., DLC (Loughborough Col., England), BS(PE), MS (Oregon)

Kirby, R.L., MD (Dal), FRCP(C), major appointment in the Department of Medicine

Kozey, C.L., BPE (UNB), MSc (Waterloo), PhD (Dal), major appointment in the School of Physiotherapy

MacGregor, L.A., BPE (Dal), MS (Illinois), Co-ordinator of the Field Experience Program in Physical Education

Maloney, T.L., BPE, BEd (Alberta), MA (Western), PhD (Alberta)

McCabe, J.F., BPE, BA (UNB), MSc, EdD (Tenn)

McIntyre, L.L., MD, MHSc (Tor), FRCP(C), Dean of the Faculty of Health Professions

Putnam, C.A., BPE (Man), MS (Wash), PhD (Iowa), Graduate Associate Director

Richards, P.D., Teach. Cert. (Trent Park Col), Laban Art of Movement Centre Certificate (England), MA (Colorado), Undergraduate Associate Director

Savoy, C.A., BPE (UNB), EdM (Boston), PhD (Tenn)

Verabioff, L.J., BA BPHE (Queen's), MS (Michigan), PhD (Ohio State)

Assistant Professors

Barnes, L.J., BPE, MSc (Dal)

Earl, M., BSc (Kin) (Waterloo), BSc (PT) (Western), MSc, PhD (Waterloo), major appointment in School of Physiotherapy

Hood, R.D., BPE (Calgary), MS, PhD (Illinois)

Jackson, L.A., BA, MA, PhD (Toronto)

Kozey, J.W., BSc, MSc (Waterloo), PhD (TUNS)

Scott, J.A., BPE (Calgary), MS (Oregon), Co-ordinator of the Activity Programme in Physical Education

Yarr, A.D., BPE, MPE (UBC)

Adjunct Professors

Ballem, H.C., BPE (UNB), MSc (Dal)

Hoyle, R.J., BA, MA (Cambridge), MSc (Dal)

Lambie, E., BSc (HomeEC) (Acadia), MPH (Nutrition) (Mich), PDT

MacLeod, D.A., BSc, MSc (Kin) (Dal)

Mangham, C.R., BEd, MA (UBC), PhD (Oregon)

Turnbull, G.L., BPT (Manitoba), MA (Dal), PhD (Rhodes [South Africa]), major appointment in the School of Physiotherapy

I. Introduction

A. Purposes of the School

The mission of the School is to develop leaders and scholars who can generate, disseminate and apply knowledge that helps to maintain and enhance health. It does this by: engaging in research related to well-being; preparing leaders in education, scholarship, and social action to maintain and enhance well-being; and by playing an educational and advocacy role, within and beyond the University, to affect social change that maintains and enhances well-being. This mission provides the foundation for degree programmes in Health Education, Kinesiology and Recreation/Leisure Studies at both the undergraduate and graduate levels.

B. Limited Enrolment

All programmes offered by the School of Health and Human Performance have enrolment limits. Applicants should refer to Table II in the FEES section of this calendar, or consult with the School.

II. School of Health & Human Performance 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.

3. Grade Point Average Requirements

The grade point average system is described in the Academic Regulations.

4. Supplemental Examinations

The School of Health and Human Performance does not offer supplemental examinations in any of its programmes.

5. Academic Appeals Procedures

5.1 Appeals to Programme Area Committee on Studies

In each of the programmes in the School of Health and Human Performance (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 chair of the appropriate programme area Committee on Studies, who will convene a meeting of the Committee.

The student has the right to appear before the Committee on Studies and he/she should notify the appropriate chair 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 programme Committee on Studies shall be conveyed to the student, in writing, by the Undergraduate Associate Director immediately after the conclusion of the appeal. If the student's appeal is being denied, this notification should include information about procedures to appeal to the School Committee on Studies, as identified below.

This appeal must be presented to the Director of the School within 30 days of notification from the Undergraduate Associate Director that the appeal at the programme level was denied.

If the student's appeal is upheld the matter need go no further and implementation is carried out by the Undergraduate Associate Director.

5.2 Appeals to the Committee on Studies of the School of Health and Human Performance

In the case of the School/Faculty regulations, the student is responsible for presenting the case to the Committee on Studies of the School of Health and Human Performance.

As noted above it is the responsibility of the student to forward the necessary documentation to the School Committee on Studies when the appeal is initiated by the student. Otherwise, it is the responsibility of the Undergraduate Associate Director.

As Chair of the School 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 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 26.2). It should be noted that this appeal to the Faculty 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 the matter need go no further and implementation is carried out by the Director of the School.

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 Chelsea School of Physical Education, Sports Science, Dance and Leisure, University of Brighton, Eastborne Campus, England. 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.

Contact the School of Health and Human Performance for further information.

III. Degree Programmes

The School offers four undergraduate degree programmes:

- BSc (Health Education)
- BSc (Kinesiology)
- BSc (Kinesiology) with Honours
- BSc (Recreation)*

* The BSc (Recreation) degree includes Therapeutic Recreation and Recreation with a minor in Business. N.B.: Students may now apply for admission to the BSc (Recreation) programme from high school.

NOTE 1: Students entering into any of the above degree programmes from high school should refer to the Admission Requirements section of this calendar.

NOTE 2: Students who are transferring into any of the above degree programmes with previous academic work will formulate a programme of study with their academic advisor, based on previous work and area of concentration. Students transferring into the BSc (Health Education) or BSc (Recreation) programmes should note that the internship experiences required in the final year of these programmes are only offered in the B term. Therefore, these transfer students should expect to be in the programme for a minimum of three years.

A. School of Health and Human Performance Core Classes

All students in the School, regardless of the degree programme in which they are registered, must complete the following core classes for graduation:

- HAHP 1000.03
- HAHP 1100.03
- HAHP 1200.03
- HAHP 2000.03
- HAHP 2100.03
- HAHP 3000.03
- HAHP 3100.03

Core Class Descriptions

HAHP 1000.03: Introduction to Health, Health Promotion and Health Professions.

This class provides the philosophical and practical scope of the School's unique perspective on health. It includes an examination of theories, research, politics and practices that have helped to define health, and health promotion as an umbrella for health-related activities. An historical perspective of health and health care is offered and current international, national and local issues are considered. Also included is an introduction to the professional streams offered in the School and how they fit into health promotion and the Canadian health care system.

FORMAT: Lecture/seminar

RESTRICTION: Restricted to students in the School of Health and Human Performance

HAHP 1100.03: Personal Health.

The focus of this class will be on providing an individual decision-making approach to personal health; a practical means of assessing and managing personal health behaviours of importance to students from a variety of social backgrounds.

FORMAT: Lecture/discussion, 3 hours

RESTRICTION: Restricted to students in the School of Health and Human Performance

HAHP 1200.03: Communications.

As all of the undergraduate degrees are considered professional degrees, it is recognized that graduates will require certain skills, abilities and knowledge about the process of communication to ensure successful delivery of programmes and successful interaction with other professionals and clients. Group skills, communication skills, presentation skills, small group skills and writing skills will receive attention in this class.

FORMAT: Lecture/seminar

RESTRICTION: Restricted to students in the School of Health and Human Performance

HAHP 2000.03: Human Growth and Development.

A study of factors influencing human growth and development from birth to maturity and throughout the lifespan, as revealed by observational and experimental studies.

FORMAT: Lecture/tutorial, 3 hours

RESTRICTION: Restricted to students in the Schools of Health and Human Performance and Physiotherapy. Others by permission of instructor with priority to Health Professions students.

HAHP 2100.03: Culture, the Arts and Health.

This class will focus upon the promotion of emotional and spiritual health through creativity, aesthetic awareness and personal expression. It will seek to develop the student's ability to understand and respect creative expression as a reflection of culture, to develop the student's own creative and problem-solving abilities and, as a future professional, to deal fairly and equitably with all people, regardless of their cultural heritage.

FORMAT: Lecture/discussion/off-site lab 3 hours

RESTRICTION: Restricted to students in the school of Health and Human Performance

HAHP 3000.03: Community Development.

This class examines the nature and process of community development, reviews differing interpretations and approaches to community development, and provides students the opportunity to develop skills to catalyze and engage in the process. The class will investigate current Canadian initiatives and projects that encourage the practice of community development, and provide the opportunity to witness and become involved in local health-related projects that foster the principles of community development.

FORMAT: Lecture/discussion/tutorial, 3 hours

RESTRICTION: Restricted to students in the School of Health and Human Performance

HAHP 3100.03: Introduction to Research Methods.

This class provides students with basic knowledge for conducting research in health professions. The content covers ethics associated with research, research design, issues in measurement, sampling, data collection strategies, data analysis and report writing. Students will learn about different approaches to research from the classical scientific model to more subjective interpretative models of inquiry. Depending on the instructor, there will be opportunities to collect data, and apply data management and computer skills.

FORMAT: Lecture/discussion 3 hours

RESTRICTION: Restricted to students in the school of Health and Human Performance

B. Bachelor of Science (Health Education)

Programme Description

The Bachelor of Science in Health Education is a four-year degree programme. 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; professional development.

The BSc (Health Education) programme guides students in attaining: (1) knowledge, attitudes and practices conducive to a healthy lifestyle, (2) professional preparation for a career in community health education, and (3) academic preparation for advanced study and research in health education or health-related fields.

Programme of Study

NOTE: On admission into the BSc (Health Education) programme, all students will be issued a Programme of Studies Form. It is the responsibility of the student to ensure that all of the class requirements for the degree as outlined on the form are completed for graduation.

Required Classes - BSc (Health Education)

Required School of Health and Human Performance Classes:

- HAHP 1000.03
- HAHP 1100.03
- HAHP 1200.03
- HAHP 2000.03
- HAHP 2100.03
- HAHP 3000.03
- HAHP 3100.03

- ANAT 1020.03
- PHYL 1010.06 OR PHYL 2030.06
- HBED 1195.03
- HEED 2250.03
- HBED 2255.03
- HEED 2361.03
- HBED 3325.03
- HEED 3335.03
- HEED 3345.03
- HEED 3351.03
- HEED 3397.03
- HEED 4412.03
- HEED 4422.03
- HEED 4450.03
- HEED 4495.155
- LEIS 3296.03
- LEIS 3480.03 OR STAT 1060.03

Required Arts & Social Sciences Classes

- PSYO 1000.06 or PSYO 1010.06
 - SOSA 1100.06
 - Arts & Social Sciences Writing class (6 credit hours)
- Open Electives (15 credit hours)

HEED Class Descriptions

HEED 1195.03: Introduction to Health Education.

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 and a self-study assignment related to the organization and functioning of a health-related agency.

FORMAT: Lecture/discussion/seminar/self-study assignment 3 credit hours

RESTRICTION: Restricted to Health Education majors

HEED 2250.03: Interdisciplinary class in Human Nutrition.

This 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.

FORMAT: Lecture 3 hours

HEED 2255.03: Drugs and Drug Education.

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. Some strategies and methods of educating about drugs and drug-related issues will be included.

FORMAT: Lecture 3 hours

HEED 2361.03: Programme Planning.

Designing, planning, implementing and evaluating programmes is fundamental to both leisure services and health education. Both disciplines develop programmes to enhance the quality of life for individuals, groups and communities. This class reviews the principles of programme planning, various programme planning models, and examples of programmes that are pertinent to leisure services and health education/promotion. The planning process will include issues such as targeting specific populations, scanning for needs and assets, partnering, managing stakeholder relationships, and evaluation.

FORMAT: Lecture/discussion 3 hours

RESTRICTION: Restricted to School of Health and Human Performance

students; limited space for other students may be made available
PRE- OR CO-REQUISITE: HEED 1195.03 or LEIS 1126.03

HEED 3325.03: Mental Health Promotion.

Concepts and issues of mental health are explored through an examination of related theories, research, writings and practices. Emphasis is placed on promoting individual and community mental health, but mental illness and its treatment are included. Mental health-related organizations and services will also be studied.

FORMAT: Lecture/seminar 3 hours

RESTRICTION: Restricted to School of Health and Human Performance students' limited space for other students may be made available.

PREREQUISITES: PSYO 1000.06 or PSYO 1010.06, HAHP 2000.03, or permission of instructor

HEED 3335.03: Introduction to Disease Prevention.

This class will consider the concept of disease, the study of disease, and the causes of disease from the perspective of prevention. Primary, secondary and tertiary prevention strategies and methods will be examined, along with the role of the health education specialist.

FORMAT: Lecture/discussion 3 hours

RESTRICTION: Restricted to School of Health and Human Performance students; limited space for other students may be made available

PREREQUISITES: ANAT 1020.03, PHYL 1010.06 or PHYL 2030.06, or permission of instructor

HEED 3345.03: Epidemiological Approach to Disease.

This class introduces students to the science of epidemiology - the study of the causes and distribution of disease in human populations. Students learn the epidemiological method, and some of the tools for measuring risk, morbidity and mortality. Known risk and causal factors associated with communicable and non-communicable diseases will be covered.

FORMAT: Lecture/discussion 3 hours

PREREQUISITES: ANAT 1020.03, PHYL 1010.06 or PHYL 2030.06, or permission of instructor

HEED 3351.03: Injury Prevention and Safety Education.

Students are introduced to the concept of safety, the causes and effects of injuries, and strategies for reducing same through safety education, engineering and legislation. Specific study of injuries, their causes, and preventive measures and programmes is preceded by a review of definitions of health, health promotion/education models and policies. The latter part of the class focuses on community orientations to injury prevention.

FORMAT: Lecture/discussion 3 hours

RESTRICTION: Restricted to School of Health and Human Performance students; limited space for other students may be made available

HEED 3397.03: Community Health Promotion Strategies.

A broad spectrum of inter-related strategies is available to promote health in communities, such as educational approaches, community action, and the development of healthy public policies using the principles of population health. The class reviews these major strategies and offers students practice in applying them.

FORMAT: Lecture 3 hours

RESTRICTION: Restricted to School of Health and Human Performance students; limited space for other students may be made available

PRE- or CO-REQUISITE: HEED 2361.03

HEED 4412.03: Sexual Health.

This class is concerned with biological, cultural, ethical, historical, psychological, religious and semantic aspects of human sexuality. Four themes are threaded throughout the class - diversity in gender roles and in sexual attitudes, behaviours and customs; critical thinking; making responsible decisions; sexual health. The class is designed to support positive integration of sexuality into the lives of individuals and to foster the prevention of sexuality-related problems, at all stages of life.

FORMAT: Lecture/discussion 3 hours

HEED 4422.03: Environmental Health.

Individual health and well-being is partially determined by the values we hold and the choices we make as individuals. Equally important is the environment that enables us to make those choices that maintain and enhance our health. This class emphasizes the importance of the environment, both physical and social, and how it is implicated in the work of health educators and other health professionals. The content reviews principles of natural and social ecology, the role of policy in shaping our environments, and research aimed at understanding the impact of various environmental conditions on health. Students will explore environmental health issues within the community and propose educational strategies to maintain and enhance health and well-being.

FORMAT: Lecture/discussion

RESTRICTION: Restricted to School of Health and Human Performance students; limited space for other students may be made available

HEED 4450.03: Comprehensive School Health Promotion.

This class will provide students with an understanding of the components of a comprehensive health education programme in a public or private school system. These components - the school health curriculum, school health services, and the community health environment - and how a community health educator might interact with the school system to facilitate their implementation, will comprise the content of the class.

FORMAT: Lecture/tutorial 3 hours

RESTRICTION: Restricted to School of Health and Human Performance students; limited space for other students may be made available

PRE- or CO-REQUISITES: HEED 2250.03, HEED 2255.03, HEED 4412.03, or permission of instructor

HEED 4495.15: Health Education Internship.

During the first 10 weeks of this class students will intern in community health education settings on a full-time basis. Details of the goals and procedures for demonstrating community health education skills and competencies are contained in the Internship Programme Handbook. During the concluding weeks of the term, students will return to the campus for a debriefing, sharing of their internship experience, and preparing for their entry into the work force.

FORMAT: Field Placement/seminar

RESTRICTION: Restricted to Health Education majors in the B term of their final year

HEED 4700.06/4701.03/4702.03: Senior Seminar.

This class is tailored for small groups of students. It is designed to allow students to focus on a particular issue or set of related issues, that are not part of the regular curriculum. Part of this class could entail a practicum experience. The class will only be offered if a faculty member is available to supervise the work.

FORMAT: Seminar

RESTRICTION: Restricted to Health Education majors in their final year

HEED 4800.06/4801.03/4802.03: Independent Study.

The Independent Study allows students to develop an area of specialization with library, laboratory or field research, under the tutelage of an appropriate faculty member.

FORMAT: Research/tutorial 3 or 6 hours

PREREQUISITES: Fourth year status; a GPA of at least 3.000; a "B" grade in an earlier class in the area of study (where appropriate); consent of advisor; consent of tutor. Intention to register for an Independent Study should be confirmed with the undergraduate secretary by April 1st of the preceding academic year.

NOTE: Students may take no more than a total of 6 credit hours of independent studies.

C. Bachelor of Science (Kinesiology)

Programme Description

Kinesiology is the study of the structure and function of the human body within the context of human movement and with a focus on the maintenance and enhancement of health and well-being. Students may elect to concentrate in one of two professional areas - ergonomics or fitness and lifestyle* - or follow a more general stream with a focus on research or other professional areas in which human movement and health are central. The School offers a four-year BSc (Kinesiology) degree as well as a four-year honours degree in Kinesiology (see Section D below).

* See stream requirements under Programme of Study below.

The goals of these degrees are to provide students with:

1. A broad background in various subdisciplines of Kinesiology, including anatomy, physiology, neurophysiology, biomechanics, movement control and psychology of performance;
2. An exposure to several science disciplines which are prerequisite and/or complementary to the kinesiology subdisciplines (e.g. biology, physics, psychology, mathematics);
3. An introduction to the discipline of health promotion and an appreciation of the role kinesiology plays in health and well-being concerns of the individual;
4. An exposure to some aspects of the humanities and social sciences, as a means of enhancing the liberal education of the student and addressing social concerns in relation to health promotion;
5. A solid foundation in research methodology and statistics, including opportunities for independent research if the student should so choose;
6. An understanding of the principles and tools necessary to evaluate human movement from a variety of perspectives and in a variety of settings, as well as hands-on experience in several evaluative procedures;
7. Professional preparation in the areas of fitness and lifestyle or ergonomics;
8. Experiences in active and problem-based learning;
9. The necessary background to enable the student to pursue graduate work in kinesiology or other related fields.

Programme of Study

On admission into the BSc (Kinesiology) programme, all students will be issued a Programme of Studies Form. It is the responsibility of the student to ensure that all of the class requirements for the degree as outlined on the form are completed for graduation.

Required Classes - BSc (Kinesiology)

Required School of Health and Human Performance Classes

- HAHP 1000.03
- HAHP 1100.03
- HAHP 1200.03
- HAHP 2000.03
- HAHP 2100.03
- HAHP 3000.03
- HAHP 3100.03
- ANAT 1020.03
- PHYL 1010.06 or PHYL 2030.06
- KINE 1104.03
- KINE 2310.03
- KINE 2320.03
- KINE 2430.03
- KINE 2465.03
- KINE 3500.03
- KINE 4600.03
- STAT 1060.03

Kinesiology Electives (18 credit hours)

Science Electives* (24 credit hours)

Open Electives** (24 credit hours)

* Science electives must be from the Faculty of Science or College of Engineering and must include 12 credit hours of Introductory Biology, Psychology, Physics, Chemistry, Mathematics or

Computing Science (excluding MATH 1060.03, MATH 1001.03, AND MATH 1002.03). At least 6 credit hours of Science electives must be at the 2000 level or above.

** Open electives may be from any discipline but must include a minimum of 6 credit hours from the Faculty of Arts & Social Sciences. Twelve credit hours must be at the 2000 level or above.

Stream Requirements

Students interested in focusing on Ergonomics or on Fitness and Lifestyle at an advanced level will be guided into one of two speciality streams. A maximum of 12 students/year/stream will be selected, primarily on the basis of GPA. Students may apply for the streams as early as the end of their second year.

Either stream can be done within the context of the BSc (Kinesiology) or the BSc (Kinesiology) with Honours programmes. In either programme the 18 credit hours of Kinesiology electives in the third and fourth years, plus 3 credit hours of open electives (i.e., a total of 21 credit hours in the third and fourth years) must be used for the following classes:

Ergonomics Stream:

KINE 3414.03	Physical Fitness Assessment & Programme Design
KINE 3476.03	Principles of Ergonomics
KINE 3482.03	Care & Prevention of Injuries
KINE 4466.03	Advanced Biomechanics
KINE 4577.03	Cognitive Ergonomics
KINE 4578.03	Physical Ergonomics
KINE 4588.03	Occupational & Clinical Kinesiology

Fitness & Lifestyle Stream:

KINE 3414.03	Physical Fitness Assessment & Programme Design
KINE 3419.03	Application of Physiological Principles to Human Performance
KINE 3485.03	Psychology of Physical Activity & Human Performance OR
LEIS 3492.03	Counselling for Health and Well-being
KINE 4108.03	Mind/Body Health
KINE 4412.06	Advanced Fitness Assessment, Exercise Prescription & Lifestyle Counselling

D. Bachelor of Science (Kinesiology) with Honours

Students who wish to complete their Honours Programme may apply at the end of their third year of study. *Acceptance into the honours programme is contingent upon the willingness of a faculty member to serve as the honours thesis advisor.* To be considered for admission into the programme, students must have fulfilled the following requirements:

1. Completed a minimum of 24 credit hours of science electives, including MATH 1000.03 and COMP 1000.03 or COMP 1400.03. At least 6 credit hours of Science electives must be at the 2000 level or above;
2. Completed an upper level Kinesiology class (at the 3000 level or above) in the area in which the research will be undertaken (e.g., ergonomics, biomechanics, exercise physiology, neuromuscular physiology) with a grade of at least B+;
3. Obtained a minimum overall GPA of 3.0 (B);
4. Obtained a minimum average in all Kinesiology and Core (HAHP) classes of 3.3 (B+);
5. Completed HAHP 3100.03 (Research Methods) with a minimum grade of B+.

Application is made through the Undergraduate Honours Coordinator by April 1st of the student's third year.

NOTE: Students accepted into the Honours programme must complete KINE 4900.06 and KINE 8880.00. These requirements are in lieu of 6 credit hours of Open Electives listed as part of the requirements for the BSc (Kinesiology).

KINE Class Descriptions

KINE 1104.03: Foundations in Kinesiology.

The objective of this class is to introduce students to Kinesiology as a discipline and for them to learn about the sub-disciplines and content areas that contribute to the general body of knowledge in

Kinesiology. In addition to understanding what these subdisciplines are, students will gain an understanding of the interrelationships among these sub-disciplines and the types of careers that students can enter. Students will be exposed to discipline content as well as the methods of measurement and evaluation and the technology involved in each of the disciplines. Problem Based Learning (PBL) will be used as the class instruction method.

FORMAT: Lecture 3 hours; tutorial 2 hours

RESTRICTION: Restricted to Kinesiology majors only

KINE 2310.03: 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.

FORMAT: Lecture/lab 3 hours

PRE- or CO-REQUISITES: ANAT 1020.03, PHYL 1010.06 or PHYL 2030.06

RESTRICTION: Restricted to Health and Human Performance students. Others by permission of instructor, with priority to Health Professions students.

KINE 2320.03: Kinesiological Anatomy.

Neuroanatomical and musculoskeletal structures are presented and discussed in order to establish the understandings necessary for an in-depth analysis of human movement.

FORMAT: Lecture/lab 3 hours

PRE- or CO-REQUISITES: ANAT 1020.03, PHYL 1010.06 or PHYL 2030.06

KINE 2430.03: Motor Control and 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.

FORMAT: Lecture/lab 3 hours

RESTRICTION: Restricted to School of Health and Human Performance students. Others by permission of instructor, with priority to Health Professions students.

KINE 2465.03: Introductory Biomechanics.

The purpose of this class is to introduce students to the area of biomechanics in human motion analysis. Students will be exposed to the concepts of kinematic and kinetic analysis of motion as well as muscle forces and moments of force as applied to the human system.

FORMAT: Lecture/lab 3 hours

PREREQUISITE: First year Physics is highly recommended

RESTRICTION: Restricted to School of Health and Human Performance students. Others by permission of instructor, with priority to Health Professions students.

KINE 3320.03: Anatomical Basis of Human Movement.

The purpose of this class is to integrate information from movement sciences in order to analyze a broad spectrum of human activities, from simple single contractions to complex patterns of both fine motor and gross motor activities. Industrial, recreational, sport and fitness movements will be examined using an integrated digital video/8 channel EMG approach.

FORMAT: Lecture/lab 3 hours

PREREQUISITES: ANAT 1020.03, PHYL 1010.06 or PHYL 2030.06, KINE 1104.03

RESTRICTION: Restricted to Kinesiology majors. Others by permission of instructor, with priority to Health Professions students.

KINE 3384.03: Physical Activity for Persons with Disabilities.

The etiology and effects of the more prevalent disabling conditions form the bases of strategies for teaching, coaching and rehabilitating those affected. Emphasis is placed on the physical components of disability and the adaptation of the environment and equipment to facilitate learning of ADL skills and sport. A practicum is required.

FORMAT: Lecture/practicum 3 hours

PREREQUISITE: KINE 2320.03 **NOTE:** Therapeutic Recreation students are exempted from this prerequisite

KINE 3414.03: 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 qualifies the student as a Canadian Society for Exercise Physiology (CSEP) Certified Fitness Consultant (CFC).

FORMAT: Lecture/lab 3 hours

PREREQUISITE: KINE 2310.03

KINE 3419.03: Application of Physiological Principles to Human Performance.

Human physiological adaptation to varying levels of exercise will be examined and the conditioning elements key to various sports analyzed. The biological prerequisites for attainment of the highest levels of athletic performance will be reviewed in concert with the appropriate application of scientific principles of training. Attention will be given to effective training design. The relationship of the body's oxygen transport and energy systems to performance enhancement will form a major emphasis, together with consideration of the role of ergogenic, environmental, age, gender and other factors affecting physical performance.

FORMAT: Active learning

PREREQUISITE: KINE 2310.03 or equivalent

KINE 3430.03: Principles of Skill Acquisition.

This class will provide students with experience in applying the theoretical concepts of motor control and learning. Variables that impact on skill acquisition, practice and instruction will be examined and applied. Real world settings will be used to illustrate the application of the principles of skill acquisition.

FORMAT: Lecture/lab, 3 hours

PREREQUISITE: KINE 2430.03

KINE 3476.03: Principles of Ergonomics.

This class applies health and human performance concepts in kinesiology to the workplace. The class content includes identifying characteristics of work environments and the effect on performance and health, the design of effective workplaces and the use of training and educational programmes to increase productivity and to reduce injuries.

FORMAT: Lecture/field work

PREREQUISITE: KINE 2430.03

KINE 3482.03: Care and Prevention of Injuries.

This class offers a fundamental understanding of the maintenance of health (personal hygiene, nutrition, prevention of common ailments and injuries). More specifically it deals with the first aid, sports injuries, their prevention and treatment. Students will acquire practical skills in taping techniques and cardiopulmonary resuscitation.

FORMAT: Lecture/lab 3 hours

PREREQUISITES: ANAT 1020.03, PHYL 1010.06 or PHYL 2030.06, KINE 2320.03, KINE 2465.03

KINE 3485.03: 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 application in other environments. Emphasis will also be placed upon personal experience and practical application.

FORMAT: Lecture, 3 hours

PREREQUISITE: KINE 2430.03 or permission of instructor

KINE 3500.03: Principles of Measurement and Evaluation.

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.

FORMAT: Lecture/lab 3 hours

PREREQUISITES: KINE 1104.03, ANAT 1020.03, PHYL 1010.06 or PHYL 2030.06, STAT 1060.03

RECOMMENDED: COMP 1000.03 or a programming class

KINE 4108.03: Mind/Body Connections.

The connection of mind and body as it relates to well-being is addressed through a survey of complementary (or alternative) health care practices including mind/body medicine (e.g., relaxation, meditation), therapeutic systems (e.g., chiropractic, homeopathy), herbology, bodywork techniques (e.g., massage, pressure point therapies), movement therapies and exercises (e.g. Alexander, yoga) and integrated medical systems (e.g., Chinese medicine, Ayurveda). Theoretical and scientific bases of each are covered and controversies surrounding these practices are addressed. This class is not designed to train students to be practitioners of any technique.

FORMAT: Lecture/lab 3 hours

RESTRICTION: Restricted to Kinesiology majors in the final year of study, or by permission of instructor

KINE 4412.06: Advanced Fitness Assessment, Exercise Prescription and Lifestyle Counselling.

The objective of this class is to provide the student with advanced techniques to assess physical fitness, design physical activity/exercise programmes and lifestyle counselling skills. In addition, this class will prepare the student to write the Canadian Society for Exercise Physiology's National Professional Fitness and Lifestyle Consultant (PFLC) examination.

FORMAT: Lecture/lab 3 hours

PREREQUISITES: ANAT 1020.03, PHYL 1010.06 or PHYL 2030.06, KINE 2310.03, KINE 3414.03, KINE 3419.03, CPR, Certified Fitness Consultant (CFC)

KINE 4418.03: Neuromuscular Principles of Human Movement.

This class uses problem based learning to study the neuromuscular system in healthy individuals. The problem involves applying normal neuromuscular principles to problems of gait encountered by a child with cerebral palsy. Students will be given a clinical problem and will be asked to apply a kinesiological approach to solving it.

FORMAT: Tutorial 4 hours; lab

PREREQUISITE: KINE 2310.03

KINE 4486.03: 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, clinical biomechanics, rehabilitation and ergonomics. Students will be introduced to several techniques used in biomechanics research.

FORMAT: Lecture/lab 3 hours

PREREQUISITE: KINE 2465.03

KINE 4577.03: Cognitive Ergonomics.

This class examines the role of cognition in injury prevention and human performance in the workplace. The class generally takes an information processing approach to consider the various topics and related issues. The class requirements include a written test on the content, a data collection project and a class presentation.

FORMAT: Lecture/lab 3 hours

PREREQUISITE: KINE 3476.03

KINE 4578.03: Physical Ergonomics.

This advanced level class examines the application of the physical sciences in the productivity, health and safety of the workplace. The class will consider the design of work and the workplace from a physical science perspective. Due emphasis will be placed on the importance of the understanding of, and designing for, the capacity and capabilities of the human operator. When possible, the class will consider the present national and international standards in health and safety related to the content areas. The class requirements include a written test on the content, a project and a class presentation.

FORMAT: Lecture/assignments, 3 hours

PREREQUISITES: STAT 1060.03, KINE 2310.03, KINE 2320.03, KINE 2465.03, KINE 3476.03, COMP 1000.03 or a programming class recommended

KINE 4588.03: Clinical and Occupational Kinesiology.

This advanced level class examines the role that Kinesiology can play in clinical and occupational settings. In particular, the class will expose the student to an integrated approach in human motion analysis with a primary focus on the use of electromyography and its relationship to other biomechanical and physiological measures. Due emphasis will be placed on the importance of understanding the strengths and weaknesses of present laboratory and field measures of human motion. The class requirements include a written test on the content, a project and a class presentation.

FORMAT: Lecture/assignments 3 hours

PREREQUISITES: KINE 3414.03, KINE 4466.03

KINE 4700.06/4701.03/4702.03: Senior Seminar.

This class is tailored for small groups of students. It is designed to allow students to focus on a particular issue or set of related issues, that are not part of the regular curriculum. Part of this class could entail a practicum experience. The class will only be offered if a faculty member is available to supervise the work.

FORMAT: Seminar

RESTRICTION: Restricted to Kinesiology majors in their final year of study

KINE 4800.06/4801.03/4802.03: Independent Study.

Senior undergraduate students develop an area of specialization under the direction of a faculty member.

FORMAT I: Experimental research (laboratory experiment) or other research study, 3 or 6 hours

PREREQUISITES: 1) third- or fourth-year status; 2) a GPA of 3.00 plus a "B" grade or better in an upper level class 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 Undergraduate Associate Director. Intention to register for an Independent Study should be confirmed with the undergraduate secretary by April 1st of the preceding academic year.

FORMAT II: Literature research, 3 or 6 hours

PREREQUISITES: The same as those for experimental research independent studies described under FORMAT I above, except that classes in research methods and statistics are not required

NOTE: Students may take no more than a total of 6 credit hours of independent studies

KINE 4900.06: Honours Thesis.

This class is designed to acquaint students with a current problem and the related experimental research procedures in Kinesiology.

FORMAT: Research/seminar

PREREQUISITES: A minimum grade of B+ (GPA of 3.3) in an upper level classes in the area in which the research will be conducted, a minimum average of B (GPA of 3.0) in all Core and Kinesiology classes, a minimum grade of B+ (GPA of 3.3) in HAHP 3100.03 Research Methods, and faculty approval of the student's research field.

KINE 8880.00: Honours Qualifying Examination.

The Honours Qualifying Exam will consist of:

- An initial orientation meeting with all honours candidates and the Honours Coordinator at the end of September;
- An oral progress report presented to the Honours Committee (consisting of the Honours Coordinator and all thesis supervisors) in January;
- A public presentation and oral defense of the thesis in April. The presentation is open to all faculty and students of the School, as well as to the general public.

E. Bachelor of Science (Recreation)

Programme Description

The Recreation curriculum will consist of two areas of emphasis or streams: Therapeutic Recreation and Recreation Administration. All students entering the programme will take a set of common Recreation classes (Recreation Foundation Classes) as well as the common set of HAHP Core Classes. Students in the Therapeutic Recreation stream will then take a set of required and elective classes to complete their degree. Students in the Recreation Administration stream will complete a minor in Business and will take several upper level application classes in the Recreation curriculum.

The general objectives of the programme are:

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 methods and statistics;
3. To provide the student with the necessary skills and knowledge for entry into the roles of leadership, advocacy, constancy and education in recreation and leisure services;
4. To provide the necessary background to enable students to pursue graduate work in leisure studies, management studies or the social sciences and humanities.

Programme of Study

On admission into the BSc (Recreation) programme, all students will be issued a Programme of Studies Form. It is the responsibility of the student to ensure that all of the class requirements for the degree as outlined on the form are completed for graduation.

Areas of Specialization

A. Therapeutic Recreation

Therapeutic recreation involves the delivery of change-oriented services to individuals with disabilities, illness and other limitations, with the focus on increasing quality of life through leisure and recreation involvement. The graduates of the Therapeutic Recreation stream will be skilled in the areas of: disability and illness, leisure theory, assessment, planning (programme and client planning), programme implementation and evaluation, and documentation. Students graduating from this stream will find employment in both traditional clinical settings such as rehabilitation facilities, psychiatric hospitals and nursing homes, and in community settings such as community mental health centres, associations for community living, schools, Boys and Girls Clubs, etc.

Therapeutic Recreation students are required to obtain basic level certification in first aid and cardiopulmonary resuscitation as a degree requirement prior to graduation. Students should consult their academic advisor for details.

Required Classes BSc (Recreation) - Therapeutic Recreation Specialization

Required School of Health and Human Performance Classes

- HAHP 1000.03
- HAHP 1100.03
- HAHP 1200.03
- HAHP 2000.03
- HAHP 2100.03
- HAHP 3000.03
- HAHP 3100.03
- PHYL 1010.06 or PHYL 2030.06
- HEED 2361.03
- KINE 3384.03
- LEIS 1126.03
- LEIS 2127.03
- LEIS 2130.03
- LEIS 2384.03
- LEIS 3127.03
- LEIS 3296.03
- LEIS 3426.03
- LEIS 3480.03
- LEIS 3492.03
- LEIS 4365.03
- LEIS 4497.15

Required Arts & Social Science Classes

- PSYO 1000.06
- PSYO 2220.03
- SOSA 1000.06 or SOSA 1200.06

Therapeutic Recreation Electives

Two of the following:

- LEIS 4482.03
- LEIS 4512.03
- LEIS 4540.03
- LEIS 4563.03

Open Electives (21 credit hours)

B. Recreation with a Minor in Business

The Recreation Administration stream will provide the student with the skills and competencies to provide leisure opportunities for persons across the life span in the community. Graduates of this programme will be able to assess the leisure needs of citizens, develop programmes with citizens that enhance their well-being, and will evaluate the effectiveness of their service provision. Graduates of this programme will likely assume middle to upper management positions in a variety of recreation and leisure contexts, including, but not limited to, municipal recreation agencies, Boys and Girls Clubs, festival management, YMCA/YWCA, tourism contexts, commercial ventures such as the Halifax Mooseheads, and a variety of entrepreneurial settings.

Required Classes BSc (Recreation)/Minor in Business

Required School of Health and Human Performance Classes

- HAHP 1000.03
- HAHP 1100.03
- HAHP 1200.03
- HAHP 2000.03
- HAHP 2100.03
- HAHP 3000.03
- HAHP 3100.03
- HEED 2361.03
- LEIS 1126.03
- LEIS 2127.03
- LEIS 2384.03
- LEIS 3296.03
- LEIS 3360.03
- LEIS 3361.03
- LEIS 3370.03
- LEIS 3480.03
- LEIS 4361.03
- LEIS 4497.155

Required Commerce Classes

- COMM 1000.03

- COMM 1101.03
- COMM 1501.03
- COMM 2201.03
- COMM 2301.03
- COMM 2401.03
- COMM 2601.03
- COMM 2701.03
- COMM 3303.03
- Commerce elective above the 2000 level

Required Arts & Social Sciences Classes

- ECON 1101.03
- ECON 1102.03
- SOSA 1000.06 or SOSA 1200.06

Open Electives (12 credit hours)

LEIS Class Descriptions

LEIS 1126.03: Foundations of Recreation.

An understanding of the place and potential of leisure for individual Canadians and Canadian society is essential if we are to move beyond the conviction that only labour is to be valued. This class introduces students to concepts including play, sport, recreation and leisure; how they are viewed and valued in our society; and how they relate to health and well-being. The content provides an overview of leisure service delivery, public access to leisure opportunities, variations in leisure involvement due to social and cultural differences, and issues that are important for future leisure service professionals. Students will have the opportunity to increase writing, verbal communication and computer skills, and learn how to use the library effectively. Practical experiences are included in the class to gain awareness and to connect with working professionals.

FORMAT: Lecture/discussion 3 hours

LEIS 2127.03: Leisure Theory.

This class will provide an introductory analysis of leisure in modern society from sociological, psychological, and social psychological perspectives. The role of leisure in the everyday life of individuals will be discussed in terms of social relationships, life stage, gender, the family, work, attitudes and motivations, 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 such topics as the influence of modern technology, the commercialization of leisure, the influence of social institutions and of the mass media.

FORMAT: Lecture/discussion 3 hours

PREREQUISITES: SOSA 1000.06 or SOSA 1200.06 or PSYO 1000.03;
LEIS 1126.03

LEIS 2130.03: Foundations and Concepts of Therapeutic Recreation.

This class provides the conceptual foundation for the study of therapeutic recreation. Philosophical, conceptual and historical issues related to the delivery of therapeutic recreation services will be discussed in terms of health and health promotion. The class will also involve the examination of professional issues such as standards of practice, ethics, quality assurance, etc.; the scope of therapeutic recreation service delivery; and service delivery settings. Finally, students will be exposed to the variety of therapeutic recreation settings through site visits and observation.

FORMAT: Lecture/discussion 3 hours

PREREQUISITE: LEIS 1126.03

CO-REQUISITES: LEIS 2127.03, HEED 2361.03

LEIS 2384.03: Leisure and Individuals with Disabilities.

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, attitudes and attitudinal development, barriers, and needs of individuals with various disabilities and members of the community will be provided throughout the class. Issues related to mainstreaming, integration

and normalization will be themes throughout the class. A practicum is required in order to facilitate hands-on experience with individuals with disabilities.

FORMAT: Lecture/discussion/practicum 3 hours

PRE- or CO-REQUISITE: LEIS 1126.03

LEIS 3127.03: Leisure Education.

This class is designed to provide students with the knowledge and skills required to facilitate leisure education interventions designed to bring about desired changes in the leisure behaviour of individuals with disabilities. While the focus of the class is on leisure education, the overarching concepts of health, wellness, and health promotion will be incorporated into the class material. The class will address the following three broad areas: a) concepts and models of leisure education, b) content related to specific skills required for leisure involvement [leisure awareness, values clarification, social skills development, friendship development, stress management, assertiveness, leisure resources, decision making, etc.] and c) instructional and interactional techniques used in leisure education. In addition, students will have the opportunity to plan and facilitate leisure education experiences in class.

FORMAT: Lecture/discussion/lab 3 hours

PREREQUISITES: LEIS 2130.03; LEIS 2384.03

LEIS 3296.03: Leadership and Group Dynamics.

This class will focus primarily on the function of leadership and the process of small group dynamics, as applied to recreation and health education service delivery. Emphasis will be placed on the achievement of individual and group goals in health related settings. In addition, effective leadership of individuals and groups within a community, through direct experience and observation, will be emphasized.

FORMAT: Lecture/discussion 3 hours

PREREQUISITES: HAHP 1200.03, LEIS 2126.03 or HEED 1195.03,
HEED 2361.03

LEIS 3360.03: Analysis of Leisure Service Delivery Settings.

The nature and scope of the delivery of leisure services is expanding rapidly even though re-engineering and downsizing are occurring in many health and human service organizations. Tomorrow's leisure service delivery may look totally different from today's. In light of the changes taking place, it is essential that students learn that service matters associated specifically with consumer service are dependent upon effective organizational analysis and the implementation and accomplishment of managerial functions dealing with quality of service. The nature and effectiveness of services provided by various leisure service agencies, i.e., government, public, non-profit, and commercial will be examined using the "holistic" model to evaluate the political, social, physical and economic impact on the assurance of quality service and improvement in identifying and meeting consumer needs, today and in the future. Consideration is given to organizational structure and governance within leisure service settings, the incorporation of the "benefits based approach" to leisure service delivery, and the merits of and considerations of entrepreneurship.

FORMAT: Lecture/discussion 3 hours

PREREQUISITES: LEIS 2127.03, HEED 2361.03; COMM 1000.03,
COMM 2301.03, COMM 2701.03

LEIS 3361.03: Recreation Administration I: Application of Administrative Concepts in Recreation Service Delivery.

Through the method of case study analysis this class will provide the student with advanced insight and application experience into selective management concepts and functions that will be useful to the potential or practicing manager in sport management, community or commercial leisure service delivery. To achieve the best kind of practice managers must apply and implement management concepts, functions, techniques, and skills to the realities of any situation. This class will build upon previous foundation concepts of administrative management and will focus on administrative functions such as establishing agency vision, mission, philosophy, and objectives, organizational behaviour,

human resource management, staff motivation, performance appraisal, volunteer management, working with higher management, ethical issues in management, quality service delivery, and risk management.

FORMAT: Case Study/lecture 3 hours

PREREQUISITES: LEIS 2127.03, HEED 2361.03, COMM 1000.03, COMM 1501.03, COMM 2301.03, COMM 2701.03

LEIS 3426.03: Techniques in Therapeutic Recreation Service Delivery.

Issues related to the delivery of therapeutic recreation services will be the focus of this class. In particular, the following topics will be addressed: documentation in therapeutic recreation; client assessment issues; therapeutic recreation programme planning (identifying client needs, selecting appropriate interventions, task and activity analysis, planning change-oriented programmes, writing behavioural objectives, etc.); programme and client evaluation; written plans of operation. The final component of this class will be the opportunity to work with individuals with disabilities in a programme planning context.

FORMAT: Lecture/discussion/practicum 3 hours

PREREQUISITES: LEIS 1126.03, LEIS 2384.03, LEIS 2130.03, HEED 2361.03, KINE 3384.03

LEIS 3480.03: Introduction to Statistics.

This class will provide an introduction to basic statistical concepts through the use of practical examples. Both descriptive and inferential statistics will be reviewed, with emphasis on the analysis and interpretation.

FORMAT: Lecture 3 hours

LEIS 3492.03: Counselling for Health and Well-being.

This class is designed to provide students with the knowledge and skills required to utilize effective communication and helping behaviours which are designed to facilitate change in the leisure behaviour of individuals with disabilities or other health problems. While the focus of the class is on facilitation techniques, the overarching concepts of quality of life, health, and health promotion will be incorporated into the class material. The class will address four broad topical areas: a) concepts of quality of life, health, health promotion, and lifestyle; b) concepts and models of helping; c) communication skills and therapeutic techniques; d) lifestyles issues related to health and well-being. Finally, students will have the opportunity to practice counselling techniques through role playing and simulations.

FORMAT: Lecture/discussion/lab 3 hours

PREREQUISITES: LEIS 2130.03, LEIS 2384.03

LEIS 4361.03: Recreation Administration II: Application of Administrative Concepts In Recreation Service Delivery.

Through the method of case study analysis this class will provide the student with advanced insight and application experience into the management concepts and functions of financial management and marketing that support the effective and efficient management of sport and leisure services. Attention will be given to the budget process, types of budgets, sources of revenue generation, etc. The student will become adept in writing budget and grant proposals and in implementing budget reviews and financial management controls. Consideration will also be given to the nature of service marketing in health and human services, the marketing process and the development of a strategic marketing plan. This class will build upon previous foundation concepts of financial management and marketing and focus on specific issues, applications, and practices as they relate to leisure service delivery.

FORMAT: Case study/lecture 3 hours

PREREQUISITES: LEIS 3361.03, LEIS 2127.03, HEED 2361.03, COMM 1101.03, COMM 2201.03, COMM 2401.03

LEIS 4365.03: Administrative Concepts In Therapeutic Recreation.

This class emphasizes the essentials of management that are pertinent to being an effective practicing therapeutic recreation manager in either a clinical setting, a healthcare facility, or a

community-based leisure or health service setting. After introducing the student to the theory and discipline of management and related ethical perspectives, the class will examine selective administrative functions in each of the areas of (a) *Operational Management*, i.e. budgeting and financial management, sources of revenue generation and grant writing, decision making, problem solving and conflict management, etc.; (b) *Human Services Management*, i.e., staff recruiting and selection, staff training and development, effective communication, motivation, performance appraisal, and volunteer management, etc. (c) *Consumer Management*, i.e., quality service management, practitioner performance, legal liability and risk management, etc.

FORMAT: Lecture/discussion 3 hours

PREREQUISITES: LEIS 2130.03, LEIS 3426.03

LEIS 4482.03: Therapeutic Recreation Specialization: Youth at Risk.

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 programmes 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. A practicum is included.

FORMAT: Lecture/practicum 3 hours

RESTRICTION: Students must be in their final two years of study

LEIS 4512.03: Therapeutic Recreation Specialization - Physical and Developmental Disabilities.

This class is an upper level therapeutic recreation specialization class which takes the concepts and skills learned in the previous therapeutic recreation classes and applies them specifically to clients with physical and developmental disabilities. Initially, issues related to etiology, characteristics, and treatment needs of clients with various physical and developmental disabilities will be discussed. The implications of these characteristics for therapeutic recreation services and the various service settings in which therapeutic recreation services are provided will then be examined. Finally, the therapeutic recreation service delivery issues specific to physical and developmental disabilities will be examined, including assessment procedures, programme intervention techniques, etc. Site visits, observations, and simulations will be used to facilitate the application of this material.

FORMAT: Lecture/discussion/practicum 3 hours

PREREQUISITES: LEIS 2127.03, LEIS 2130.03, LEIS 2384.03, KINE 3384.03

LEIS 4540.03: Therapeutic Recreation Specialization - Addiction and Mental Illness.

This class is an upper level therapeutic recreation specialization class which takes the concepts and skills learned in the previous therapeutic recreation classes and applies them specifically to clients with mental health problems and/or addiction. Initially, issues related to etiology, characteristics, and treatment needs of clients with addiction and mental illness will be discussed. The implications of these characteristics for therapeutic recreation services and the various service settings in which therapeutic recreation services are provided will then be examined. Finally, the therapeutic recreation service delivery issues specific to mental illness and addiction will be examined, including assessment procedures, programme intervention techniques, etc. Site visits, observations, and simulations will be used to facilitate the application of this material.

FORMAT: Lecture/discussion/practicum 3 hours

PREREQUISITES: LEIS 2127.03, LEIS 2130.03, LEIS 2384.03, PSYO 2220.03

LEIS 4563.03: Therapeutic Recreation Specialization - Ageing and Lifestyle.

This class is an upper level therapeutic recreation specialization class which takes the concepts and skills learned in the previous therapeutic recreation classes and applies them specifically to older adults. Initially, issues related to theories of ageing, characteristics of older adults and pre-retirement planning will be discussed. The implications of these characteristics for therapeutic recreation services and the various service settings in which therapeutic recreation services are provided will then be examined. Finally, the therapeutic recreation service delivery issues specific to older adults will be examined, including assessment procedures, programme intervention techniques, etc. Site visits, observations, and simulations will be used to facilitate the application of this material.
FORMAT: Lecture/discussion/practicum 3 hours
PREREQUISITES: LEIS 2127.03, LEIS 2130.03, LEIS 2384.03, PSYO 2220.03

LEIS 4597.15: Internship.

This class is an extended professional development placement during the B term of the final year of study. It requires the completion of a 12-week, full-time placement in a recreation service delivery agency. In addition, the placement involves an in-depth agency analysis and the completion of a service project for the agency.
FORMAT: Placement 12 weeks B term
PREREQUISITE: Completion of all programme requirements; approval of advisor

LEIS 4700.06/4701.03/4702.03: Senior Seminar.

This class is tailored for small groups of students. It is designed to allow students to focus on a particular issue or set of related issues, that are not part of the regular curriculum. Part of this class could entail a practicum experience. The class will only be offered if a faculty member is available to supervise the work.
FORMAT: Seminar
RESTRICTION: Restricted to Recreation students in their final year of study

LEIS 4800.06/4801.03/4802.03: Independent Study.

Senior undergraduate students develop an area of specialization under the direction of a faculty member.
FORMAT: Library survey or other research study 3 or 6 hours
PREREQUISITES: A GPA of at least 3.00, 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 an Independent Study should be confirmed with the undergraduate secretary by April 1st of the preceding academic year. NOTE: Students may take no more than 6 credit hours of independent studies.

D. Bachelor of Physical Education/ Bachelor of Education Degree (Five Year Combined)

As of 1995 the School of Health and Human Performance no longer admits students to this programme. Students entering their fifth year of study in the fall of 1998 will continue with the integrated programme as outlined below. All Education classes will be offered through the Department of Education at Mount Saint Vincent University.

Students who are continuing in the programme will be governed by the calendar issued for the year in which they entered the programme.

PHSE Class Descriptions

PHSE 2384.03: Physical Activity for Disabled Persons.

Please refer to KINE 3384.03 in the Bachelor of Science (Kinesiology) section of this calendar.

PHSE 4395.03: Curriculum Planning and Development.

An introduction to basic curriculum theory and programme development principles. Developing a curriculum philosophy, objectives, class and unit plan and programme evaluation are covered. Appropriate field work is included.
FORMAT: Lecture/field work, 3 hours
PREREQUISITE: PHSE 3398.06 or PHSE 3402.06 or permission of instructor

PHSE 4410.03: Care and Prevention of Athletic Injuries.

Please refer to KINE 3482.03 in the Bachelor of Science (Kinesiology) section of this calendar.

PHSE 4475.03: Psychology of Sport and Physical Activity.

Please refer to KINE 3485.03 in the Bachelor of Science (Kinesiology) section of this calendar.

PHSE 4496.12: 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 class. 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.
FORMAT: Seminar/field work 12 hours
PREREQUISITE: PHSE 3398.06 or PHSE 3402.06
RESTRICTION: Limited to BPE/BED students only

PHSE 4497.03: 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.
FORMAT: Lecture 3 hours

PHSE 4800.06/4801.03/4802.03: Independent 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 3.00, a "B" grade in an earlier class in the area in which the project will be conducted (where appropriate); consent of instructor and Undergraduate Associate Director. Intention to register for a Directed Study should be confirmed with the undergraduate secretary by April 1st of the preceding academic year. NOTE: Students may take no more than 6 credit hours of independent studies.

History

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Dean

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Chair

O'Brien, J.T. (494-3698)

Undergraduate Coordinator

Hanlon, G. (494-3642)

Professors Emeriti

Flint, J.E., MA (Cantab), PhD (Lond), FR HistS, FRSC
Waite, P.B., MA (UBC), PhD (Tor), FRSC

Professors

Cross, M.S., BA, MA, PhD (Tor)
Crowley, J.E., AB (Princ), MA (Mich), PhD (Johns Hopkins)
Hanlon, G., MA (Tor), Dr.de 3e cycle (Bordeaux)
Parpart, J.L., BA (Brown), MA, PhD (Boston)
Pereira, N.G.O., BA (Williams), MA, PhD (UC Berkeley)
Taylor, G.D., BA, PhD (Penn), Dean, Faculty of Arts and Social Sciences
Traves, T. BA (Manitoba), MA, PhD (York), President and Vice-Chancellor, Dalhousie University
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Assistant Professors

Bleasdale, R., BA, MA, PhD (Western)
Cadigan, S., BA (Memorial), MA (Queen's), PhD (Memorial)
Tillotson, S.M., BIS (Waterloo), MA, PhD (Queen's)
Vander Meulen, J., BA (UBC), MA, PhD (Tor)
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I. 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 intensive 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.

II. 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.

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.

A. Major in History (3 year)

The three year Major programme is a general liberal arts degree with concentration in History. It permits a wide range of choice in the selection of classes.

Students are required to take:

- At least four (preferably five) and not more than eight full credits in History, beyond the 1000 level.
- At least two of these credits must be at the 3000 or 4000 level

B. Advanced Major in History (4 year)

The Advanced Major offers more intensive training in History than does the three-year degree. Students must complete the requirements for the three-year degree and fulfill the following additional requirements:

- The number of required full credits in History is increased to at least six but not more than nine, beyond the 1000 level. At least three credits must be above the 2000 level.
- In the fourth year of study, Advanced Major students must take two credits in History, at least one of them at the 3000 or 4000 level

C. Honours in History (4 year)

The Honours degree is intended for students who plan to proceed to graduate work and for others who wish to enjoy the experience of an intensive research project, the Honours essay. Students must complete the requirements for the three-year degree and fulfill the following additional requirements:

- The number of required full credits in History is increased to at least nine but not more than eleven credits, beyond the 1000 level

- Honours students must take HIST 4990.06, the Honours essay, and HIST 4985.03, Historiography (when offered)

NOTE: Applications for Honours in History are not considered by the Department until the winter term of the student's third year. Please enquire at the Department for the relevant deadline.

D. Combined Degrees (4 year)

Students may complete an Advanced Double Major or a Combined Honours, in History and another subject. Students should consult the Undergraduate or Honours Coordinators in both Departments about regulations for such degrees.

III. 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. 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.

IV. Classes Offered

NOTE: Not every class is offered every year. Please consult the current timetable to determine which classes are offered this year.

HIST 1004.06: Introduction to European History.

This class will introduce students to the major themes and events in European history, from the end of the Roman Empire to the fall of Communism in 1990. Since the class will be taught by two class directors (one in each term), the exact period, the topics presented and the approach will vary from one year to another.

INSTRUCTOR: Staff

FORMAT: Lecture

HIST 1501.03: Comparative Global History

Global history — the study of change over long spans of time and large areas — allows us to examine questions not easily recognized in history conducted on smaller scales. The world order familiar to us — dominated by "the West" and organized by capitalist relations — contains elements both ancient and new. By comparing different cultural zones in historical periods before Europe's global dominance in the nineteenth century, this course will explore the diverse ways different cultures met the challenges of survival, and how patterns of connection and domination were made and unmade. Select themes — including trade, transportation, ecology, and state formation — will be used to highlight pre-modern patterns of connection across the globe.

INSTRUCTORS: J.E. Crowley/P. Zachernuk

FORMAT: Lecture 3 hours

EXCLUSION: HIST 1500.06

HIST 1502.03: Origins of Modern Global Society

The contemporary world is both intricately connected and intensely confusing. To make some sense of the global stage on which we now lie, historians have recently redoubled their efforts to explore the development of these connections, especially since the eighteenth century. This course follows some of these explorations, attempting to understand the nature and impact of Europe's economic expansion, and how diverse cultures around the world experienced modern social and economic forces. Understanding the complex flows of such things as nationalist ideas, labour migrations, disease epidemics, and imperial control help reveal the ties which bind us together.

INSTRUCTORS: S. Cadigan/J.L. Parpart

FORMAT: Lecture/Tutorial 3 hours

EXCLUSION: HIST 1500.06

HIST 1862.06: North American Experiences

Canada and the United States are neighbours with a history which, for more than 500 years, has both brought them together and kept them apart. The ebb and flow of integration and separation continues to be a source of fascination and debate among both peoples. In an effort to understand why, over time, Canadians and Americans have become both similar and different, this class tours major episodes in their two national experiences. Themes discussed include: natives versus newcomers, emergence of a settlement frontier, Anglo-French rivalry, revolutionary challenge, the rise of democracy, Civil War crisis, conquest of the West, city life, women in transition, war machines, class, racial and cultural conflict, and the invention of mass culture. Grades are based on a blend of participation and written assignments.

INSTRUCTORS: J.T. O'Brien/D.A. Sutherland

FORMAT: Lecture 3 hours

HIST 2001.03: 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 familiarize students with the medieval world view.

INSTRUCTOR: C.J. Neville

FORMAT: Lecture/tutorial 3 hours

RECOMMENDED: HIST 1001.03

HIST 2002.03: 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: Lecture/tutorial 3 hours

RECOMMENDED: HIST 1001.03 and/or 2001.03

HIST 2006.03: The Atlantic World, 1450-1650: European Colonization of the Americas.

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: Lecture/discussion 3 hours

RECOMMENDED: HIST 1002.03

HIST 2007.03: The Atlantic World, 1650-1800: European Empires in the Americas.

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: Lecture/discussion 3 hours
RECOMMENDED: HIST 1002.03, 2006.03

HIST 2015.03: War and Society in Early Modern Europe 1550-1750.

The class deals with the presence of war in European societies, and how states and societies adapted and transformed under the impetus of the desire to achieve victory against an adversary. Among specific topics the class will deal with the transformation of tactics and technology on land and sea; the creation of modern tax systems; problems of supply and recruitment; ideologies of the military function; the creation of standing armies; the impact of hostilities on society.

INSTRUCTOR: G. Hanlon
FORMAT: Lecture 2 hours, tutorial 1 hour

HIST 2020.06: 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, through to the end of the Gorbachev era.

INSTRUCTOR: N.G.O. Pereira
FORMAT: Lecture/tutorial 3 hours
RECOMMENDED: HIST 1001.03 or 1002.03 or 1050.06 or 1400.06
RESTRICTION: Restricted to students in their second year or higher (first year students, with permission of instructor)
CROSS-LISTING: RUSS 2021.06

HIST 2021.03: Soviet Russia.

Survey of Soviet Russia from 1917 to the present. Topics discussed will include the Revolution of 1917, the Civil War and War Communism, NEP, Collectivization, the Great Purges, WWII, and the Post-Stalin era.

INSTRUCTOR: N.G.O. Pereira
FORMAT: Lecture/tutorial 3 hours
EXCLUSION: HIST 2020.06
CROSS-LISTING: RUSS 2023.03

HIST 2040.06: 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: Lecture/tutorial 3 hours

HIST 2060.06: The Origins of Modern Italy.

An introductory survey of Italy from the late Renaissance to the French Revolution from its position as Western civilization's most advanced economy and culture to a place on the margins of Europe. Specifically, the class deals with the ecology and the economy, the influence of the Catholic church and the Inquisition, the impact of piracy, banditry, plague and the Thirty Years' War, the decline of the Spanish empire and the evolution from a Baroque sensitivity to the Enlightenment.

INSTRUCTOR: G. Hanlon
FORMAT: Lecture/tutorial 3 hours

HIST 2061.03: Civilization of Baroque Italy 1550-1700.

The class will deal with Italy at the period of its greatest influence on Western Civilization, in its various aspects. The class will survey the political, social, economic, and cultural history of the peninsula and how it fits into the European context.

INSTRUCTOR: G. Hanlon
FORMAT: Lecture/tutorial
EXCLUSION: HIST 2060.06

HIST 2100.06: Themes in British History from the Early Middle Ages to Modern Times.

This class covers a wide span of British history, with precise chronological period varying from year to year according to instructor interest. Themes include Barbarian Migrations, the growing central authority; relatives between component parts of the British isles; the power of the church; popular culture; industrialization; the expansion overseas; and the development of parliamentary democracy.

INSTRUCTORS: S.J. Brooke, C.J. Neville, D.R. Woolf
FORMAT: Lecture
EXCLUSION: HIST 2101.03

HIST 2104.03: 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: Lecture/tutorial 3 hours
Recommended: HIST 1001.03, or 1002.03
EXCLUSION: HIST 2102.03, 2103.06
RESTRICTION: Restricted to students in their second year or higher

HIST 2105.03: England under the Stuarts, 1603-1688.

This sequel to HIST 2104.03 studies the principal events of 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: Lecture/tutorial 3 hours
RECOMMENDED: HIST 1001.03, or 1002.03
EXCLUSION: HIST 2102.03, 2103.06
RESTRICTION: Restricted to students in their second year or higher

HIST 2111.03: 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: Lecture/tutorial 3 hours

HIST 2112.03: 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: Lecture/tutorial 3 hours
RECOMMENDED: HIST 2111.03

HIST 2153.03: A History of the Scottish People from Earliest Times to the Industrial Revolution.

Scotland, the northern half of the island of Britain, has had a history quite unlike that of its sister kingdom, England. This course provides an overview of Scottish social, political, economic and cultural history over a period of 1,200 years, emphasising themes such as clanship, highland-lowland distinctions, religious dissent, the growth of royal power, and relations with other European kingdoms and the under world.

INSTRUCTORS: C.J. Neville, D.R. Woolf
FORMAT: Lecture/Tutorial
EXCLUSION: HIST 2151.03 and 2152.03

HIST 2211.03: 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. Approved with Canadian Studies.

INSTRUCTOR: S. Cadigan

FORMAT: Lecture/tutorial 2 hours (evening)

EXCLUSION: HIST 2210.06

HIST 2212.03: 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. Approved with Canadian Studies.

INSTRUCTOR: Staff

FORMAT: Lecture/tutorial 2 hours (evening)

EXCLUSION: HIST 2210.06

HIST 2221.03: 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 organization. Study of the mechanisms and institutions for imposing order includes the criminal law, industrial discipline, and more respectable forms of cultural activity. Approved with Canadian Studies.

INSTRUCTORS: R. Bleasdale/M. Cross

FORMAT: Lecture/tutorial 3 hours

EXCLUSIONS: HIST 3241.03, 3242.03, 3280.03, 3281.03

HIST 2222.03: Rough Justice - Order, Disorder and Canadian Popular Culture, 1890s to the Present.

This class continues the study of Canadian popular culture described in HIST 2221.03, from the turn of the century to the present. Approved with Canadian Studies.

INSTRUCTORS: R. Bleasdale/M. Cross

FORMAT: Lecture/tutorial 3 hours

EXCLUSIONS: HIST 3241.03, 3242.03, 3280.03, 3281.03

HIST 2230.06: 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, in particular, against the backdrop of socio-economic change. French-English relations, federal-provincial relations, and regional disparities are key to this presentation of the development of contemporary Canada. Approved with Canadian Studies.

INSTRUCTOR: Staff

FORMAT: Lecture/tutorial 3 hours

RECOMMENDED: HIST 1200.06 or an equivalent introductory class in Canadian history

HIST 2261.03: True Believers 1914 to Present - The Left and the Right in Canadian Politics.

The class will study the ideas and practices of Canadian political movements of the Left and the Right. We will attempt to understand why such movements have arisen and declined, and what significance they have had for Canadian politics and society. Topics will include: the Progressive movement; the CCF and NDP; Communism and Fascism; Social Credit; the radical right and the New Left; the Reform Party.

INSTRUCTOR: M. Cross

FORMAT: Lecture/tutorial 3 hours

HIST 2270.06: 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. Approved with Canadian Studies.

INSTRUCTOR: D. Sutherland

RECOMMENDED: HIST 1200.06 or an equivalent introductory class in Canadian history

HIST 2331.03: Creation of an American Republic: The United States, 1580-1840.

This class studies the first example of a major theme of modern history: how colonial societies become nations. When British colonization of the Americas began in the late sixteenth century, no one involved in the process intended or expected the result to be an independent republic on the other side of the Atlantic. Yet during the following two centuries of colonial history many of the crucial and distinctive features of what became the United States took shape: aggressive displacement of indigenous peoples, thoroughgoing privatization of economic resources, racial slavery, ethnic diversity, popular sovereignty, and religious pluralism. The republican revolution of 1776-1783 institutionalized these features in the new United States of America. But migration and growth, new technologies, ongoing conflict with first nations and European states, and a new middle class culture of commerce, industry and reform increasingly strained the Union. By the mid-nineteenth century the United States faced the fate of so many post-colonial nations, irreconcilable sectional divisions.

INSTRUCTOR: J. Crowley

FORMAT: Lecture 3 hours

HIST 2332.03: The American Republic from 1840 to the 1990s.

The United States has been the world's most powerful nation for much of the 20th-century. This course traces American pre-eminence from the sectional divides of the mid-19th century through the end of the Cold War in the late 20th-century. Key themes include continuities of migration and ethnic pluralism; conquest, expansion, and technological change; social and economic values and political culture; but discontinuities as well: the Civil War; the rise of big business, World War II; the Great Depression; communism and totalitarianism abroad; the civil rights movement, and the current crisis of New Deal liberalism.

INSTRUCTOR: J. Vander Meulen

FORMAT: Lecture

EXCLUSION: HIST 2330.06

HIST 2333.03: 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: J. Vander Meulen

FORMAT: Lecture 3 hours

RECOMMENDED: HIST 1300.06 or a similar survey class in U.S. history

EXCLUSION: HIST 2330.06

HIST 2335.03: 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 with 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: Lecture/tutorial 3 hours

RECOMMENDED: HIST 1300.06

RESTRICTION: Restricted to students in their second year or higher

HIST 2382.03: Central America to 1979.

See class description for SPAN 2069.03 in the Spanish section of this calendar.

HIST 2383.03: Area Studies on Mexico and Central America.

See class description for SPAN 2070.03 in the Spanish section of this calendar.

HIST 2425.03: Africa Before 1900.

Modern historians of Africa continually battle popular misconceptions and myths about the African past. This course explores both the patterns of change within the continent and the means by which our knowledge of these has developed. Themes of particular interest include: dynamics along the desert-sudan frontier, the Atlantic and Oriental slave trades, Indian Ocean connections, the spread of Islam, and the early stages of colonial rule.

INSTRUCTORS: P.S. Zachernuk/J.L. Parpart

FORMAT: Lecture/Tutorial 3 hours

EXCLUSION: HIST 2410.03 and 2421.03

HIST 2426.03: Africa Since 1900.

This course examines the nature of African states, societies and economies from the colonial period to the present, seeking the historical context for contemporary African dynamics. Some questions of interest include: How have development projects changed Africa? What are the myths and realities of neo-colonialism? How have Africa's political traditions supported quests for national stability? How have all these affected men's and women's lives?

INSTRUCTORS: J.L. Parpart/P.S. Zachernuk

FORMAT: Lecture/Tutorial 3 hours

EXCLUSION: HIST 2422.03

HIST 2614.03: Making Gender - Male and Female from Antiquity to Mary Wollstonecraft.

This class examines the diverse and fascinating ways western cultures have shaped the meanings of gender. The history of women informs us about the once little-known history of femininity. And, as a result, historical changes in definitions of masculinity become visible. The meanings of gender are exposed in this class through topics such as: the origins myths of western civilization, the Galenic one-sex model of physiology, patristic theology, the cult of courtly love, eighteenth century salons, and the rights of man.

INSTRUCTOR: S.M. Tillotson

FORMAT: Lecture/tutorial 3 hours

CROSS-LISTING: WOST 2300.03

HIST 2615.03: Making Gender - Male and Female from the American Revolution to the present.

This class examines the diverse and fascinating ways western cultures have shaped the meanings of gender. The history of women informs us about the once little-known history of femininity. And, as a result, historical changes in definitions of masculinity become visible. The meanings of gender are explored in this class through topics such as: republican motherhood, respectability, the family wage, the homosexual, imperialism, citizenship, welfare dependency, and infertility.

INSTRUCTOR: S.M. Tillotson

FORMAT: Lecture/tutorial 3 hours

CROSS-LISTING: WOST 2301.03

HIST 2910.03: History of Leisure

This class aims to make students familiar with the historical roots of the leisure pursuits of humankind. 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

CROSS-LISTING: LEIS 2110.03

HIST 2995.03: 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. Farley

FORMAT: Lecture/discussion 3 hours

EXCLUSION: HIST 2295.03

CROSS-LISTING: BIOL 3404.03

PLEASE NOTE: Students are advised to check the format of the 3000-level classes, whether 'lecture/discussion' or 'seminar'. Consult department timetable.

HIST 3002.03: 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 versions of a well-researched paper, 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: Lecture/discussion 3 hours

PREREQUISITE: HIST 2001.03 or 2002.03 or 2101.03

RECOMMENDED: HIST 1001.03

EXCLUSIONS: HIST 3021.03 and 3022.03

CROSS-LISTING: COMR 3008.03

HIST 3003.03: 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: Lecture/discussion 3 hours

PREREQUISITE: HIST 2101.03

RECOMMENDED: HIST 1001.03 or 2001.03 or 2002.03

EXCLUSIONS: HIST 3009.03, 3007.03 and 3010.06

HIST 3006 .03: Renaissance and Reformation Europe, 1348-1559.

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: Lecture/discussion 2 hours

PREREQUISITE: Any first- or second-year European history class

EXCLUSION: HIST 2005.03

HIST 3040.06: Culture and Behaviours 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. We study the traditional universe of Early Modern civilization and the process it underwent in a variety of domains: religion, education, sociability, deviance, social organization, etc. Emphasis is placed on sources, methods and critical analysis.

INSTRUCTOR: G. Hanlon

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: Any European Medieval or Early Modern history or literature

***HIST 3072.03: The History of Modern Science.**

Science became separated from general knowledge between about 1500 and the early 19th century. It has proved to be a remarkably powerful cultural force from the time of the first Scientific Revolution of the 17th century until our own times. This class examines the ways that science and scientists have given us knowledge of the natural world from the time of Copernicus to the development of evolutionary theory and relativistic physics in the 19th and 20th centuries. It is intended for students interested in interdisciplinary knowledge who are prepared for extensive reading.

INSTRUCTOR: E.L. Mills

FORMAT: Lecture 3 hours

CROSS-LISTING: BIOL 3402.03, SCIE 4000.03

HIST 3073.03: History of Marine Sciences

This class outlines the major developments leading to the present state of knowledge in biological, chemical, physical and geological science of the ocean. Events and changes are related to their cultural and social contexts. It asks how scientific facts, institutional developments, and social influences have affected acquisition of knowledge about the oceans.

INSTRUCTOR: E.L. Mills

FORMAT: Lecture 3 hours

CROSS-LISTINGS: BIOL 4664.03, OCEA 4331.03/5331.03

HIST 3090.03: Russian Society.

Basic institutions of 20th century Russian society are considered in their historical context, with special attention to the former role of the Party, 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 1000.06, 2000.06

CROSS-LISTING: HIST 5090.03, RUSS 3090.03

HIST 3092.03: 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", Brezhnev, Gorbachev, and Yeltsin.

INSTRUCTOR: N.G.O. Pereira

FORMAT: Lecture/discussion

RECOMMENDED: HIST 2020.06 or RUSS 2022.03/2023.03

CROSS-LISTING: RUSS 3092.03

HIST 3096.03: The History of Ideas in Russia - From Official Nationality to Solzhenitsyn's Neo-Slavophilism.

This class examines some of the main currents in Russian intellectual history from the middle of the nineteenth century through the 1990s. Topics include classical Slavophilism and early Westernism, Populism and Nihilism, Anarchism, Marxism, Leninism, Socialist Realism, anti-Stalinism, Glasnost, neo-Westernism (Sakharov), and neo-Slavophilism (Solzhenitsyn).

INSTRUCTOR: N.G.O. Pereira

FORMAT: Lecture/discussion

RECOMMENDED: HIST 2020.03

CROSS-LISTING: RUSS 3096.03

HIST 3112.03: 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: Lecture/discussion 2 hours

PREREQUISITE: One of the following: HIST 2111.03; 2112.03; 3113.03; 3114.03; 3116.03; 2030.06; 2331.03; 2332.03; or instructor's consent.

HIST 3113.03: 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: Lecture/discussion 2 hours

PREREQUISITE: One of the following: HIST 2111.03; 2112.03; 3112.03; 3314.03; 3116.03; 2030; 2081.06.

HIST 3114.03: 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: Lecture/discussion 2 hours

PREREQUISITE: One of the following: HIST 2111.03; 2112.03; 3112.03; 3113.03; 3116.03; 2030.06; 2081.06

IST 3116.03: 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 were represented in twentieth-century Britain, from the First World War to the present day.

INSTRUCTOR: S.J. Brooke

FORMAT: Seminar 2 hours

PREREQUISITE: As this is an advanced seminar in British history, the instructor's permission is required for registration.

CROSS-LISTING: HIST 5116.03

HIST 3220.03: 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. Approved with Canadian Studies.
INSTRUCTOR: M.S. Cross
FORMAT: Lecture/tutorial 3 hours
PREREQUISITE: One previous history class
RECOMMENDED: HIST 2222.03

HIST 3222.03: 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. Approved with Canadian Studies.
INSTRUCTOR: R. Bleasdale/M.S. Cross
FORMAT: Seminar 2 hours
PREREQUISITE: A class in Canadian History
CROSS-LISTING: HIST 5222.03

HIST 3223.03: The Caring Society? - Welfare in Canada since 1900.

This class examines changes over the twentieth century in the ways Canadians have dealt with people's needs, their own or others', whether for income, housing, personal care, or other matters of survival and well-being. Both private and government forms of welfare provision will be studied, with the overall purpose of understanding why Canada came to have the kind of welfare state it does. Among the topics that may be covered are: changing views on the origins and prevention of dependency; definitions of need; religious and ethnic variations in welfare practices; connections between welfare and women's lives; charitable fundraising; promoters and opponents of government social programmes; financing the welfare state; gender, race, constitutional, and class issues in welfare. Approved with Canadian Studies.
INSTRUCTOR: S. Tillotson
FORMAT: Lecture/tutorial or seminar 2 hours
PREREQUISITE: HIST 1200.06 or HIST 2212.03 or HIST 2230.06
CROSS-LISTING: HIST 5223.03

HIST 3226.03: Law and Justice In Canadian Society, to 1890.

Discussion begins with an exploration of concepts of law and justice among Native Peoples prior to and during the occupation of the continent by the French and British. The class pursues crime and the criminal law as they relate to broader changes within the society and economy of New France, British North America, and Canada. We analyse shifting patterns and perceptions of crime and punishment; the social, economic, political, and ideological significance of the criminal law; the influence of Britain, France and the United States on legal developments. Approved with Canadian Studies.
INSTRUCTOR: R. Bleasdale
FORMAT: Lecture/discussion
RECOMMENDED: One previous history class
EXCLUSION: HIST 3225.03

HIST 3227.03: Criminal Law, Crime and Punishment in Canadian Society, 1890 to the present.

Continuing the approach and themes of HIST 3226.03, this class studies crime, punishment, and the criminal law as they reflect social, economic, political, and ideological developments. As appropriate these are placed within their international context, and in particular linked to the American system of law and justice. We

pay attention to the impact of technological change on crime, detection of crime, enforcement mechanisms, and alternative means and methods of punishment. Approved with Canadian Studies.
INSTRUCTOR: R. Bleasdale
FORMAT: Lecture/discussion
RECOMMENDED: One previous history class
EXCLUSION: HIST 3225.03

HIST 3228.06: 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 16th 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. Faulkner
FORMAT: Lecture/seminar 3 hours
PREREQUISITE: COMR 2001.03 or COMR 2002.03 or permission of the instructor
CROSS-LISTING: COMR 3003.06

HIST 3245.03: French Canada.

Given in English for English-speaking students, this class studies the development of French-Canadian nationalist politics in their social, cultural, philosophic and economic contexts. While the emphasis is on Quebec-Canada relations, French-Canadians in the Maritime, Ontario and the West will also be studied. Approved with Canadian Studies.
INSTRUCTOR: S.M. Tillotson
FORMAT: Lecture/discussion 2 hours
PREREQUISITE: One class in Canadian history, or instructor's consent
EXCLUSION: HIST 2240.03

HIST 3255.03: 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 nationalisms; the opening of new frontiers; politics and ideology. Approved with Canadian Studies.
INSTRUCTOR: Staff
FORMAT: Lecture/discussion 2 hours
PREREQUISITE: A survey of Canadian history

HIST 3260.03: History of the Canadian West.

This class 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. Approved with Canadian Studies.
INSTRUCTOR: D.A. Sutherland
FORMAT: Seminar or lecture/discussion 2 hours
PREREQUISITE: A class in Canadian history
EXCLUSION: HIST 2250.03

HIST 3273.03: 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. Approved with Canadian Studies.
INSTRUCTORS: D. Sutherland/J. Pingard
FORMAT: Seminar 2 hours
PREREQUISITE: One Canadian History class or instructor's consent
EXCLUSION: HIST 3270.06

HIST 3274.03: Nova Scotia: Post-Confederation.

An exploration of the transformation of provincial society in response to the onset of Canadianization and industrialization. Approved with Canadian Studies.

INSTRUCTORS: D. Sutherland/J. Fingard

FORMAT: Seminar 2 hours

PREREQUISITE: One Canadian History class or instructor's consent

RECOMMENDED: HIST 3273.03

EXCLUSION: HIST 3270.06

HIST 3292.03: 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. Approved with Canadian Studies.

INSTRUCTOR: G.D. Taylor

FORMAT: Lecture/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

EXCLUSION: HIST 3291.03

HIST 3302.03: Technology and History in North America.

The effects of technology on our lives are ever-present, from debates over the ethical uses of biogenetics to promises of a glowing future through "high-tech" enterprises and computer networking. The continuing impact of technological change has been a central feature of the history of the United States and Canada since the Industrial Revolution in the nineteenth century. This class examines aspects of this history, including the origins of technological, innovation and the impact of technological change on the household, the workplace, the environment as well as broader economic and political events. Approved with Canadian Studies.

INSTRUCTOR: G.D. Taylor

FORMAT: Lecture/Discussion 2 hours

RECOMMENDED: One class in Canadian or U.S. History

HIST 3331.03: The United States, Canada and the World.

At the end of the Second World War the United States was the world's foremost military and economic nation, and Canada had gained a sense of autonomy as an emerging "middle power". This class focuses on the foreign relations of these two countries through the Cold War and post-Cold War eras, examining the impact of economic and technological as well as political and military developments, and places the U.S.-Canadian relationship in the context of global changes. Approved with Canadian Studies.

INSTRUCTOR: G.D. Taylor

FORMAT: Lecture/Discussion 2 hours

RECOMMENDED: One class in Canadian or U.S. History or an appropriate class in a related discipline

HIST 3350.03: 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.B. Crowley

FORMAT: Lecture/discussion 2 hours

RECOMMENDED: A class in the sociology or social anthropology of the family

CROSS-LISTING: WOST 3300.03

HIST 3360.03: Enslavement and Emancipation: African-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 1300.06 or one second-year U.S. history class

RECOMMENDED: HIST 2332.03

HIST 3361.03: 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 1300.06 or second-year U.S. history class

RECOMMENDED: HIST 2332.03

HIST 3366.03: Industry, Unionism, and Working people in the United States, 1873-1990.

America's rise to industrial pre-eminence shot forward after the Civil War. By 1900 it 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 1930's 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 1870's to 1990.

INSTRUCTOR: J. Vander Meulen

FORMAT: Seminar 2 hours

PREREQUISITE: HIST 1300.06 or one second-year U.S. history class

RECOMMENDED: HIST 2332.03, HIST 2333.03, HIST 2334.03

HIST 3368.03: From Hoover to Eisenhower.

This class traces United States politics, economy, foreign policy and the development of the state during the period from 1929 to 1961. The goal is to develop a fairly advanced sense of the main events of the period, including the Great Depression, the New Deal political order, America and World War II, the Cold War, relations with the Third World, the Korean War, McCarthyism, and the civil rights movement. This class is also intended to expose students to the main literature, historiography and theory on American history in the contemporary period. Students taking this class are strongly encouraged to take its complement, HIST 3369.03.

INSTRUCTOR: J. Vander Meulen

FORMAT: Lecture/discussion

PREREQUISITE: HIST 2333.03 or instructor's permission

HIST 3369.03: From Kennedy to Clinton.

This class traces United States politics, economy, foreign policy and the development of the state during the period from 1961 to 1994. It follows through on HIST 3368.03 which is a prerequisite. The idea is to build on the historiographical and theoretical background developed in HIST 3368.03 by testing it against the main events of recent American history which include the Great Society reforms, the crisis of liberalism, the Vietnam War, Watergate, the rise of the new right, the Reagan Revolution, and the Clinton years.

INSTRUCTOR: J. Vander Meulen

FORMAT: Lecture/discussion

PREREQUISITE: HIST 3368.03

HIST 3370.03: American Landscapes.

Landscapes are the product of human culture ordering nature for economic, social, political, religious, recreational, and artistic purposes. Landscape history analyzes and interprets the use and

design of such features as fields and woodlands, roads and waterways, settlements and buildings, towns and suburbs, and parks and cities. This class examines the use and meaning of the spatial environment among the various societies in North America from the sixteenth to the twentieth centuries. Among the topics are the meaning of areal resources for indigenous peoples, the occupation and settlement of colonial populations, transportation and continental expansion, town planning, the politics of water and land in the West, preservation movements, scenic tourism, and the literary and artistic stylization of landscapes. The class welcomes non-history students with an interdisciplinary interest in issues regarding planning and design, cultural ecology, and the governance of resources.

INSTRUCTOR: J. Crowley

FORMAT: Lecture/Discussion

HIST 3430.03: The Making of Colonial Africa, c. 1850 - 1930.

European colonial rulers and business interests laid out the framework of the sub-Saharan African colonial order from about 1850 to the 1920s, seeking ways to exploit African labour and natural resources. But imperial plans were limited and sometimes frustrated by African interests, and by historical dynamics within Africa, such as the rise of new merchants and Islamic revolution. This class assesses how the realities of Africa intersected with European imperial ambitions to profoundly change African society during this early colonial period.

INSTRUCTOR: P. Zachernuk

FORMAT: Lecture/discussion 2 hours

CROSS-LISTING: HIST 5430.03

HIST 3435.03: The Rise and Fall of African Slavery.

Many African societies, like pre-industrial societies elsewhere, used slaves as well as other forms of labour for a variety of purposes. The rise of external slave trades after 1700 — notably across the Atlantic and Sahara — transformed many African societies into specialized slave exporters. As external slave trades declined in the 19th century, many African economies used extensive internal slave labour to produce exports, a pattern colonial governments were slow to change in the 20th century. This class examines these changes in African slavery, and how they affected such issues as gender relations and class structure.

INSTRUCTOR: P. Zachernuk

FORMAT: Lecture/discussion 2 hours.

HIST 3451.03: South Africa to 1860.

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: Lecture/discussion 2 hours

PREREQUISITE: Any 2000-level African history class or permission of the instructor

EXCLUSION: HIST 3450.06

HIST 3452.03: South Africa since 1860.

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: Lecture/discussion 2 hours

PREREQUISITE: Any 2000-level African history class or permission of the instructor

RECOMMENDED: HIST 3451.03, 2131.03, 2132.03

EXCLUSION: HIST 3450.06

CROSS-LISTING: HIST 5452.03

HIST 3461.03: Gender and Development in Africa.

This class examines the economic, political and social roles of women and men in Africa from precolonial to modern times. It analyzes the way women and men construct their lives, participate in political and economic processes and contest and reinforce the definitions of womanhood and manliness in various African societies. The class will examine development and feminist/gender theory in the light of recent debates over gender and development issues.

INSTRUCTOR: J.L. Parpart

FORMAT: Seminar 2 hours

PREREQUISITE: Any 2000-level African history class or permission of the instructor

CROSS-LISTING: WOST 3310.03, HIST 5461.03

HIST 3462.03: Distortion or Development - African Economic History.

An examination of economic change in tropical Africa, with particular attention to the question of economic development and underdevelopment. From the premercantilist period to the current conjuncture.

INSTRUCTOR: J. Parpart

FORMAT: Seminar 2 hours

PREREQUISITE: Any 2000-level African history class or permission of the instructor

CROSS-LISTING: HIST 5462.03

HIST 3470.03: Wars and Revolutions in Nineteenth Century Africa.

Africa in the nineteenth century was profoundly reshaped by a complex set of events. Muhammed Ali undertook to modernize Egypt. New Islamic states founded in the west developed plantation economies of unrivaled size. On the Atlantic coast, merchant princes made their fortunes supplying tropical goods for Europe's Industrial Revolution. In Central Africa the search for slaves and ivory both wreaked havoc and stimulated new states. In the south, the rise of Zulu power generated waves of conquest and consolidation. This class assesses the extent to which Africa was reshaped in the revolutionary century before colonial partition.

INSTRUCTOR: P.S. Zachernuk

FORMAT: Lecture/discussion

PREREQUISITE: Any 2000-level African history class or permission of the instructor

HIST 3750.03: History of Seafaring.

An examination of our maritime heritage. 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.

Approved with Canadian Studies.

INSTRUCTOR: S. Cadigan

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: One class in history or permission of the instructor

HIST 3985.03: The Human Record: A Short History of History from Antiquity to the Nineteenth Century.

How did we come to study history? In what ways does our understanding of the past differ from that of our ancestors? Do different cultures throughout the world approach the reading and writing of history in different ways? When did history become a "discipline" and how have its relations with literature, philosophy and science evolved over three millennia? How have the social and political contexts of historical thought, as well as the information media through which such thought can be expressed, influenced what is known or written about? These are some of the questions explored in this survey of the history of history from earliest times to the late nineteenth century. Instruction by means of lecture will be supplemented by readings from select "classic" historians from Thucydides and Sima Qian in antiquity BC to Leopold von Ranke in the nineteenth century. Attention will also be paid to the development of alternative or subversive historiographical traditions within different societies, to the problem of historical

dissent, and to the historiographical cultures of non-western societies, especially Chinese and Islamic. (Recommended for History Majors and Honours students.)

INSTRUCTOR: D.R. Woolf

FORMAT: Lecture

HIST 4001.03: Directed Readings.

FORMAT: This is a class of individual instruction. Students may only register for this class with the written permission of a Faculty member and the Undergraduate Coordinator.

HIST 4003.03: 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 must do 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: Seminar 2 hours

PREREQUISITE: HIST 2001.03 or 2002.03 or 3002.03

EXCLUSION: HIST 3000.06, HIST 3001.03

CROSS-LISTING: HIST 5701.3

HIST 4004.03: Crime and Society In Post-Conquest England.

This class explores the development of the criminal law in England between 1066 and 1500. 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 the 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 2100.06 or HIST 3003.03

EXCLUSION: HIST 3004.03, 3007.03, 3009.03, and 3010.06

CROSS-LISTING: HIST 5704.03

HIST 4105.03: 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

PREREQUISITE: Any class in medieval or early modern British history

EXCLUSION: HIST 3105.03

CROSS-LISTING: HIST 5105.03

HIST 4271.03: The Fisheries of Atlantic Canada - Society and Ecology in Historical Perspective.

The marine animals of Atlantic Canada have supported people for millennia. Popular explanations of recent collapses in many species assume that fish, as common-property, open-access resources, have been exploited by people without regard for conservation. This

seminar considers such 'tragedy of the commons' approaches from two perspectives: social and ecological history. It examines how gender, class and ethnic relationships have shaped fishing communities, and how such communities interact with material changes in marine environments. Topics to be covered will include First Nations' use of marine resources, European settler fishing communities, customary regulation of marine resources, possible previous ecological crises affecting fisheries, changes in harvesting technology, state-defined marine property rights, and fisheries' 'professionalization'. This seminar is intended for senior History undergraduates. Its interdisciplinary nature opens the class to senior undergraduates from biology, economics, environmental science, oceanography, sociology and social anthropology, and women's studies.

INSTRUCTOR: S. Cadigan

FORMAT: Seminar

PREREQUISITE: HIST 2211.03, HIST 2212.03 or HIST 2270.06; or by consultation with instructor

HIST 4350.03: People and Things - Material Culture In History.

A seminar for advanced undergraduates on Material Culture Studies in social and cultural History. The class discusses the theoretical, cross-cultural, and historical considerations involved in the interdisciplinary study of material culture — economic technology, household comforts, architecture, clothing, even the landscape itself. The chief interpretative issues deal with the relation between consumption patterns and economic, social and cultural change. Northwestern Europe and North America, 1600-1850, provide the context for examples of empirical research.

INSTRUCTOR: J. Crowley

FORMAT: Seminar 2 hours

HIST 4475.03: African Intellectuals and the Modern Experience.

African thinkers have long pondered the challenges of the modern era, and have established lines of thought with which African intellectuals now address Africa's profound problems. But this engagement with the modern world has moved through different phases, just as the social location of the African intelligentsia has changed over time. This class will explore this intellectual history by setting specific writers in context, and then examining their original writings to ponder such questions as: What were the roots of "African Christianity"? How did African intellectuals respond to "scientific" racism? What was the appeal of Pan-Africanism? What was Negritude? How socialist was African socialism? How do postmodern insights about the invention of identity affect the idea of being "African"?

INSTRUCTOR: P.S. Zachemuk

FORMAT: Seminar

EXCLUSION: HIST 3475.03

CROSS-LISTING: HIST 5475.03

HIST 4500.03: 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

PREREQUISITE: Enquire at Department

CROSS-LISTING: HIST 5500.03

HIST 4600.03: Topics in Late 19th and Twentieth-Century American and British History.

This class will, depending upon the staffing in any particular year, examine a selection of themes in late 19th and 20th century British and American history, including, for instance, labour/labour history, political history (including state formation), cultural history, and history of race and national identity. Depending upon staffing, this class may concentrate upon the history of one country or may offer a comparative aspect. It will be intended for graduate or senior

undergraduate students with some background in either British, American or Canadian history. Evaluation will be through research papers and, possibly, a final exam.

INSTRUCTORS: S.J. Brooke/J.T. O'Brien

FORMAT: Seminar 2 hours

PREREQUISITE: 3000-level class in modern British, American or Canadian history

CROSS-LISTING: HIST 5600.03

HIST 4985.03: The Varities 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

PREREQUISITE: Concurrent enrolment in HIST 4990.06 or instructor's consent

RECOMMENDED: A class in modern intellectual history or PHIL 2540.06

CROSS-LISTING: HIST 5985.03

HIST 4990.06: 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

PREREQUISITE: Admission to History 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. For complete class descriptions please consult the appropriate department listing in this calendar.

NOTE: Classes marked * are not offered every year. Please consult the timetable on registration to determine if these classes are offered.

History of the Sciences

- BIOL 3502.03/HIST 3072.03/SCIE 4000.03: The History of Modern Science. E.L. Mills
- *HIST 2995.03: The History of Modern Medicine. J. Farley
- *HIST 3075.03: History of Tropical Medicine. J. Farley
- BIOL 4664.03/OCEA 4331.03/SCIE 4001.03/HIST 3073.03: History of Marine Sciences. E.L. Mills
- PSYO 4580.06: History of Psychology. J.W. Clark

Philosophy of the Sciences

- *PHIL 2410.03: Philosophy of Psychology. M. Hogan
- *PHIL 2420.03: Philosophy of Biology. R. Campbell
- BIOL 3601.03: Nature Conservation. M. Willison
- *COMR 3532.03: Mystical Consciousness and Modern Science: R. Ravindra
- *COMR 3533.03: Spirituality and Ecology. R. Ravindra

Interdisciplinary Studies

During the last two decades, numerous areas of interdisciplinary study have developed in the Arts and Social Sciences, as well as in the Sciences. Research at the graduate and faculty level now increasingly crosses disciplinary boundaries, and is published in interdisciplinary journals. In response to this research, a variety of new interdisciplinary programmes have been established at universities across North America. Asian Studies, Black Studies, Cultural Studies, Women's Studies, Gender Studies, Canadian Studies, Environmental Studies, International Development Studies: these are some of the new interdisciplinary programmes of study that have emerged.

At Dalhousie University, students can currently choose among interdisciplinary programmes in Canadian Studies, Contemporary Studies, International Development Studies, Linguistics and Women's Studies. (Interdisciplinary classes are also available in Health Studies and in Science.) Students can concentrate on a particular interdisciplinary area of study in their undergraduate programme; they can combine an interdisciplinary programme with study in a traditional discipline; or they can combine two interdisciplinary areas of study. In some cases, students can construct programmes that bring together classes in the Arts and Social Sciences with classes in the Sciences.

For more information regarding these programmes, students should consult the entries in this calendar for:

- Canadian Studies
- Contemporary Studies
- International Development Studies
- Linguistics
- Women's Studies

International Development Studies

Location: Multidisciplinary Centre
1461 Seymour Street
Halifax, NS B3H 3J5
Telephone: (902) 494-3814
Fax: (902) 494-2105

Dean

Taylor, G.D., BA, PhD (Penn)

Coordinator & Undergraduate Advisor

Binkley, M.E. (494-3814/6589) E-mail: binkley@is.dal.ca
<http://www.dal.ca/~intdwww/intdwww.html>

Administrative Assistant

MacKinnon, M. (494-3814) E-mail: mackinn@is.dal.ca

Faculty

Barkow, J.H. (Sociology & Social Anthropology)
Benóit, J. (Henson College)
Binkley, M.E. (Sociology & Social Anthropology)
Bishop, M. (French)
Black, D. (Political Science)
Cadegan, S. (History and Marine Affairs)
Campbell, J. (Resource and Environmental Studies)
Chaff, A. (Chemistry)
Cherry, D.C. (Business Administration)
Chute, J. (Transition Year Programme)
Cohen, F. (Resource and Environmental Studies)
Dubois, L. (Sociology & Social Anthropology)
Dwire, A. (Resource and Environmental Studies)
Faulkner, C.T. (Comparative Religion)
Flerlbeck, K. (Political Science)
Finbow, R. (Political Science)
Gardiner Barber, P. (Sociology & Social Anthropology)
Harvey, F. (Political Science)
Jarman, J. (Sociology & Social Anthropology)
Jiménes, M. (Spanish)
Kamra, O.P. (Biology)
Kirk, J. (Spanish)
Lesser, B. (Economics)
Mann Borgese, E. (International Oceans Institute)
McAllister, R.L. (Economics)
McIntyre, L. (Health Services Administration)
Newkirk, G. (Biology)
Parpart, J.L. (History & Women's Studies)
Patriquin, D. (Biology)
Patton, D. (Business Administration)
Pereira, N.G.O. (History & Russian Studies)
Ravindra, R. (Comparative Religion)
Sagebien, J. (Business Administration)
Saunders, P. (Law)
Shaw, T.M. (Political Science)
Sullivan, K. (Public Administration)
Thiessen, V. (Sociology & Social Anthropology)
Vander Zwagg, D. (Law)
Wainwright, J.A. (English)
Willison, M. (Biology and Resource and Environmental Studies)
Wood, S. (Resource and Environmental Studies)
Zachernuk, P. (History)

Adjunct Professors

Kamra, S.
Pachal, B.
Zurbrigg, S.

I. 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 offers an undergraduate degree in international development studies. This reflects a commitment to the concept of development, not only for those privileged to live in Canada and other wealthy nations - but also for those in the South.

To foster greater understanding through study, teaching, research and shared field experiences of North-South partnerships and development, distinctive BA major and honours and combined honours degree programmes enable students to work within interdisciplinary frameworks, as well as to draw upon the international development experiences from over twenty overseas linkage programmes currently engaged in by Dalhousie University.

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 at the 1000 level.

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 3492.03, 3493.03, as well as in one relevant language in addition to English, e.g., French, Spanish, and Russian through appropriate classes and supporting activities.

Students are encouraged to enter the combined honours or double 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.

Students are encouraged to take advantage of third year abroad programmes, e.g., the Cuba Programme at the University of Havana, and Summer Institutes, e.g., the Shastri Programme. 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, DalTech, 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

- Asian Studies Collection (Killam)
- Centre for African Studies
- International Ocean Institute
- International Student Centre
- Lester Pearson International
- Oceans Institute of Canada
- Rural and Urban Planning
- School of Resource and Environmental Studies

Saint Mary's University

- Asian Studies Programme
- Centre for Latin American and Caribbean Development

- Gorsebrook Research Institute
- International Centre

II. Degree Programmes

Students should consult the "Degree Requirements" section of this calendar for specific Faculty requirements.

A. Honours In International Development Studies

Departmental requirements

Completion of appropriate first-year classes in at least two of the major participating social science or humanities disciplines:

- COMR 1000.06, COMR 2000.06, ECON 1101.03/1102.03, EARTH 1040.03, EARTH 1050.03, HIST 1050.06, HIST 1400.06, HIST 1500.06, HIST 1501.03, HIST 1502.03, POLI 1100.06, POLI 1103.06, POLI 1501.06, RUSS 1020.03, RUSS 1070.03, SOSA 1000.06, SOSA 1050.06, SOSA 1100.06, SPAN 1100.03 or SPAN 1110.03

Advanced Classes Required

- INTD 2001.03/2002.03
- INTD 3001.03/3002.03
- INTD 4010.06 (with honours essay requirement)
- The equivalent of six full credit classes at or above the 2000-level in two or three established IDS disciplines, with at least one full credit per discipline. See below for the listing of International Development Studies classes
- Normally students should have a grade point average of B⁺ (GPA 3.30) or better.

NOTE: a minimum of the equivalent of four full-credit classes must be at the 3000-level or above. These can be chosen from the IDS approved list.

Minor: Two full credits in a minor subject (that are not from the IDS established discipline list).

B. Combined Honours In International Development Studies and another subject

Students with a grade point average of B⁺ (GPA 3.30) or better are encouraged to consider applying for the Combined Honours Programme. After meeting the first-year requirements, students have two options from which to choose. The First Option, is a maximum of seven (7) full credits in the major subject with a minimum of four (4) full credits in the allied subject. In addition, four (4) full elective credits which are not from the major or allied subject group. The Second Option, with departmental approval, a maximum of nine (9) full credits in the major subject with a minimum of four (4) full credits in the allied subject. This particular option can be broken down further into a combination of eight (8) full credits in the major subject and five (5) full credits in the allied subject or seven (7) full credits in the major subject and six (6) full credits in the allied subject. In addition, two (2) full elective credits which are not from the major or allied subject group.

Several of the more common combined honours programmes with International Development Studies are: Biology, Economics, Earth Sciences, History, Journalism, Philosophy, Political Science, Sociology, Social Anthropology, Spanish, Theatre and Women's Studies. Students interested in taking any of these combined honours programmes or in discussing other possible programmes should consult initially with the department.

To obtain a Combined Honours, with an emphasis upon International Development Studies, students must have:

- The two core IDS classes: INTD 2001.03/2002.03 and INTD 3001.03/3002.03
- Four full credits at the 2000-level or above from two or three established disciplines with at least one full credit per discipline
- Four full credits at the 3000-level or above from the IDS list of classes. Students may count INTD 3001.03/3002.03 as well as INTD 4010.06 within this group.
- INTD 4010.06: Honours Essay Practicum

To obtain admittance into the Combined Honours programme, with an emphasis upon International Development Studies, students must have a B average or better in a group of three (3) IDS classes comprised of the two core classes and an additional advanced class from one of the established disciplines within the IDS programme.

Students who take a combined honours, with an emphasis on a subject other than International Development Studies, must take a minimum of:

- INTD 2001.03/2002.03
- INTD 3001.03/3002.03
- One full credit at the 2000-level or above from one of the established disciplines within the IDS programme
- an additional credit at an advanced level from one of the established disciplines listed within the IDS programme

C. Advanced Major In International Development Studies

Departmental requirements

Completion of appropriate first-year classes in at least two of the major participating social science or humanities disciplines:

- COMR 1000.06, 2000.06; ECON 1101.03/1102.03; EARTH 1040.03, 1050.03; HIST 1050.06, 1400.06, 1500.06; POLI 1100.06, 1103.06, 1501.06; RUSS 1020.03, 1070.03; SOSA 1000.06, 1050.06, 1100.06; or SPAN 1100.03, 1110.03.

Advanced Classes Required

- INTD 2001.03/2002.03
- INTD 3001.03/3002.03
- The equivalent of two (2) full-credit classes at or above the 2000-level in two established IDS disciplines, with at least one full credit per discipline. See below for the listing of International Development Studies classes.

NOTE: A minimum of the equivalent of three (3) full-credit classes must be at the 3000-level or above.

D. Major In International Development Studies

Degree Requirements

Completion of appropriate first-year classes in at least two of the major participating social science or humanities disciplines:

- COMR 1000.06, 2000.06; ECON 1101.03/1102.03; EARTH 1040.03, 1050.03; HIST 1050.06, 1400.06, 1500.06; POLI 1100.06, 1103.06, 1501.06; RUSS 1020.03, 1070.03; SOSA 1000.06, 1050.06, 1100.06; or SPAN 1100.03, 1110.03.

Advanced Classes Required

- INTD 2001.03/2002.03
- INTD 3001.03/3002.03
- Plus the equivalent of one full-credit class at or above the 3000-level from the IDS list below.
- The equivalent of one full-credit class at or above the 2000-level in each of two established IDS disciplines. See below for the listing of International Development Studies classes.

III. Classes Offered

INTD 2001.03/2002.03: Introduction to Development I and II.

This is the entry level class 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/seminar

PREREQUISITE: Two first-year classes as indicated above under (1)

INTD 3001.03/3002.03: Seminar in Development III and IV.

This class is a sequel to 2001.03/2002.03 and will focus on theoretical perspectives and development strategies regarding global, regional and national policies. The class will examine development issues in greater depth, paying particular attention to the link between theory, policy and practice.

FORMAT: Seminar

PREREQUISITE: INTD 2001.03/2002.03

INTD 3100.03: Indian Society: Change and Continuity.

The objective of this half-credit class offered by faculty from Dalhousie is to introduce students to the society and culture of India from an interdisciplinary perspective. India presents a society of enormous complexity and an unbroken living civilization of great antiquity. The focus of the class will be on selected, significant aspects of Indian society with particular emphasis on issues of current relevance. Topics discussed include a historical background, social structure, political and social constraints to economic development, health issues, major religions and philosophy, development and foreign policy since independence, science and technology, disaster relief and development, and literature.

FORMAT: Lecture/discussion 2½ hours

PREREQUISITE: 2nd year Arts and/or science class

CROSS-LISTING: SOSA 3310.03

INTD 3101.03/3102.03/3202.06: Special Topics in International Development Studies.

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

PREREQUISITE: INTD 2001.03/2002.03

INTD 1201.06/2201.06/3201.06: International Development Studies Through Canada World Youth.

This class is intended for Canada World Youth participants who wish to use the Canada World Youth experience as a basis for further study — leading to an academic credit. Canada World Youth registrants will receive prescribed readings in development studies and directions for field research. Tutorials will be available for those able to come to Dalhousie prior to — and/or following Canada World Youth field placements. Detailed written guidelines will be given to all course participants.

They will be required to keep a journal of their observations and to write a research paper drawing upon their experiences on the Canada World Youth project (in Canada with part of their assignment and) overseas. Upon return to Canada, they should communicate with the International Development Studies Office at Dalhousie and should extra guidance be sought, they inform the Canada World Youth Coordinator at that point. Normally, within 60 days of their return, they should submit representative extracts from their daily journal and the main paper (in accordance with detailed guidelines provided by the Instructor) for evaluation. All CWY course participants are encouraged to present talks to local high schools, youth groups, and appropriate community-university organizations.

The degree of analysis will be more demanding the higher the level of course taken. In each case, papers may be written in English or French.

FORMAT: Consult M. MacKinnon in the Department for more information

RECOMMENDED: High school/university global studies

RESTRICTION: Can only be taken once in a student's programme

INTD 4001.03/ 4002.03B/ 4003.06/4100.06: Special Topics in International Development Studies.

See class description for INTD 3101.03, above.

PREREQUISITE: INTD 3001.03/3002.03/3302.06

INTD 3300.06: International Development Studies through the SHASTRI Summer Institute in India.

The placement would be for nine to ten weeks offered during the summer. Two weeks of briefing and debriefing students both within Canada and India, with remaining weeks spent in the actual placement in India. This class is for students who wish to earn academic credit related to their work in India. Students will be chosen for their academic standing as well as their strong interest in South Asia. Students will be accompanied overseas by a faculty member. Open to graduate students.

FORMAT: Consult department for further details

PREREQUISITE: INTD 3100.03 or SOSA 3310.03 and permission of class coordinator

CO-REQUISITE: Placement through nationwide competition

CROSS-LISTING: SOSA 5530.06

INTD 3301.03/3302.03/3303.03/3304.03/3305.03: The Cuba Programme at the University of Havana.

The Cuba Programme is a special interdisciplinary work/study programme in Cuba. It is open to students taking an advanced major, double advanced major, honours or combined honours programme in International Development Studies or Spanish. Preparatory reading specific to the country and readings on International Development will be undertaken before the placement. The International Development Studies Programme will work closely with the supervisory personnel at the work/study sites, who will report regularly on student progress.

The programme takes place generally in the second semester (winter term), lasts for one term, and is offered at the University of Havana, Cuba. Dalhousie University will grant 2.5 credits to those students who successfully complete their classes in Cuba. Enquiries and applications should be addressed to the Coordinator of the Programme.

INSTRUCTORS: Latin American Faculty of Social Sciences (FLACSO) University of Havana

FORMAT: Five weeks - University of Havana; 6 weeks - Field Placement in Cuba; 2 weeks - University of Havana

PREREQUISITES: Students must be, at least, functional in Spanish (SPAN 1020.06 and SPAN 2020.06). There is the possibility that additional intensive language classes offered via the Spanish Department will be required.

RESTRICTION: Open only to students enrolled in 3rd or 4th year of the IDS or Spanish programme

CROSS-LISTING: SPAN 3301.03/3302.03/3303.03/3304.03/3305.03

INTD 3310.06: Cuban Culture and Society

Through seminars, lectures and other activities, students will be introduced to Cuban society and culture. This class consists of briefing and debriefing sessions in Halifax with two weeks spent in Cuba. In Cuba, there will be daily lectures in English at the University of Havana and field visits to sites in and around Havana with opportunities to meet Cubans. Participants will be required to keep a journal, conduct an interview with a Cuban, and prepare and present a research paper on an approved Cuban topic.

INSTRUCTORS: Latin American Faculty of Social Sciences (FLACSO), University of Havana, and Staff

FORMAT: Six weeks summer intersession with two weeks in Havana

PREREQUISITES: Beginning Spanish or equivalent, INTD 2001.03/2002.03

CROSS-LISTING: SPAN 3310.06

INTD 4010.06: Honours Essay Practicum in International Development Studies.

Advanced seminar in theory and methodology leading to preparation and defence of honours essay.

FORMAT: Seminar

PREREQUISITES: INTD 2001.03/2002.03 and INTD 3001.03/3002.03

INTD 4211.03: Gender and Development I.

The first semester will discuss the interrelationship of various development and feminist theories. It will provide a conceptual overview and practical tools for understanding the problems faced by women in developing countries and Canada. Students taking this class at a graduate level will be expected to attain a higher level of achievement and may be required to do additional assignments.

FORMAT: Seminar

PREREQUISITES: INTD 3001.03/3002.03 or equivalent (SMU-IDS equivalent 400.0)

EXCLUSION: INTD 4210.06

CROSS-LISTING: SMU-IDS 422.1/622.1; SOC 422.1; WMS 422.1

INTD 4212.03: Gender and Development II.

The second semester will provide an analysis of the gender dimensions of programmes and policies that affect women. Case studies will focus on issues such as education, work, health, the role of the state, and empowerment. Students taking this class at a graduate level will be expected to attain a higher level of achievement and may be required to do additional assignments.

FORMAT: Seminar

PREREQUISITE: INTD 3001.03/3002.03 or equivalent (SMU-IDS equivalent 400.0)

EXCLUSION: INTD 4210.06

CROSS-LISTING: SMU-IDS 423.2/623.2; SOC 423.2; WMS 423.2

IV. Other Acceptable Classes

Listing of Classes routinely accepted within International Development Studies at Dalhousie University follows. 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. For a full listing of Saint Mary's University faculty and classes in IDS, please consult the current Saint Mary's University academic calendar, which is available in the Dalhousie IDS Office.

NOTE: Classes marked * are not offered every year so please consult the current timetable, in addition to the calendars, when registering.

1. Biology

The importance of an understanding of biology for informed contribution to sustainable development cannot be over-emphasized. While the class specifically identified as part of the IDS programme is Biology 4650.03: Resource Systems and Economic Development, students are also encouraged to explore additional, appropriate biology classes with officials of the Biology Department.

- *BIOL 4650.03: Resource Systems and Economic Development

2. 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. It has important implications for international cultures and development questions.

- *COMR 2001.03: Judaism
- *COMR 2002.03: Christianity
- *COMR 2003.03: Islam
- *COMR 2011.03: Hinduism
- *COMR 2012.03: Chinese and Japanese Religions
- *COMR 2013.03: Buddhism
- *COMR 3004.03: Religion and International Development
- *COMR 3014.03: Love and Death in World Religions
- *COMR 3015.03: Myths, Symbols and Rites
- *COMR 3532.03: Mystical Consciousness and Modern Science
- *COMR 3533.03: Spirituality and Ecology

3. 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.

- ESCI 2410.03: Environmental and Resource Geology

4. Economics

A grasp of economic frameworks whereby societies allocate resources (human resources and capital) is a prerequisite for understanding development plans and national prospects, development projects and foreign aid, the constraints and the possibilities for sustainable development.

- *ECON 2238.03: The Industrial Revolution in Europe
- *ECON 2239.03: The European Economy in Historical Perspective - After the Industrial Revolution
- ECON 2251.03: Applied Development Economics I
- ECON 2252.03: Applied Development Economics II
- *ECON 3241.03: Comparative Economic Systems: National Economies
- *ECON 3242.03: Comparative Economic Systems: Economic Organization and Planning
- *ECON 3317.03: Poverty and Inequality
- *ECON 3330.03: International Trade
- *ECON 3333.03: Theories of Economic Development
- *ECON 3334.03: Economic Development - Recent Debates, Controversies and Conflicts
- ECON 3335.03: Environmental Economics
- *ECON 3336.03: Regional Development
- *ECON 3350.03: Social Cost Benefit Analysis
- *ECON 4431.03: International Payments

5. 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 2211.06: Commonwealth Literature
- ENGL 2221.06: Fictions of Development
- *ENGL 3075.03: Multicultural Fictions
- ENGL 3076.03: Multicultural Poetry

Spanish

- *SPAN 2069.03: Central America to 1979
- *SPAN 2070.03: Area Studies on Mexico and Central America
- *SPAN 2109.03: Cuba from Colonial Times to 1961
- *SPAN 2110.03: The Cuban Cultural Revolution
- *SPAN 2130.03: Latin American Dictators in the Novel
- *SPAN 2210.03: The Novel of the Mexican Revolution
- *SPAN 2230.03: Contemporary Latin American Prose, Part I
- *SPAN 2240.03: Contemporary Latin American Prose, Part II
- *SPAN 3050.06: Culture and Society of the Dominican Republic
- *SPAN 3070.03: Contemporary Latin American History
- SPAN 3301.03/3302.03/3303.03/3304.03/3305.03: The Cuba Programme at The University of Havana
- SPAN 3310.06: Cuban Culture & Society

6. 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 BSc major in environmental science-however, current programmes that provide streams emphasizing environmental subjects include Earth Sciences (particularly Environmental Studies) geology and hydrogeology, ECON 2251.03, ECON 2252.03, marine biology and POL 3585.03.

- ESCI 2410.03: Environmental and Resource Geology
- POLI 3537.06: Management and Conservation of Marine Resources
- POLI 3585.03: Politics of the Environment
- POLI 3589.03: Politics of the Sea

7. 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.

- *HEAS 5200.03: Principles of International Health

8. 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 2006.03: After Columbus: Early European Imperialism in the Americas 1450-1650
- HIST 2007.03: The Atlantic World: The Expansion of Europe, 1650-1800
- HIST 2020.06: Imperial and Soviet Russia
- HIST 2021.03: Soviet Russia
- HIST 2270.06: The Atlantic Provinces
- HIST 2425.03: Africa Before 1900
- HIST 2426.03: Africa Since 1900
- HIST 3090.03: Russian Society
- *HIST 3092.03: Russian Topics
- *HIST 3430.03: The Making of Colonial Africa, c. 1850-1930
- *HIST 3435.03: The Rise and Fall of African Slavery
- *HIST 3451.03: South Africa to 1860
- *HIST 3452.03: South Africa since 1860
- *HIST 3461.03: Gender and Development in Africa
- *HIST 3462.03: Distortion or Development: African Economic History
- HIST 4271.03: The Fisheries of Atlantic Canada's Sociology and Ecology in Historical Perspective
- *HIST 4320.03: Feminism, Gender, and Development

9. Political Science

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 systems of government and those in other countries.

- *POLI 2300.06: Comparative Politics
- POLI 2500.06: World Politics
- *POLI 3302.03: Comparative Development Administration
- POLI 3303.03: Human Rights and Politics
- POLI 3315.03: African Politics
- POLI 3340.03: Approaches to Development
- *POLI 3360.03: Politics in Latin America
- *POLI 3525.03: Comparative Foreign Policy Simulation
- POLI 3531.03: The UN in World Politics
- POLI 3535.03: The New International Division of Labour
- *POLI 3537.06: Management and Conservation of Marine Resources
- POLI 3540.03: Foreign Policies of Third World States
- POLI 3544.03: Political Economy of Southern Africa
- *POLI 3550.03: Japanese Foreign Policy
- *POLI 3585.03: Politics of the Environment
- *POLI 3589.03: The Politics of the Sea

10. Russian

Russian and the Soviet Union have been important players on the world stage for many centuries. The history and current situation of this region has had profound importance on the development of both Europe and Asia, as well as the developing regions. The study of this region is increasingly important to development theory, practice and planning

- RUSS 2022.03: Imperial Russia
- RUSS 2023.03: Soviet Russia
- RUSS 2061.03: Russian Modernism
- RUSS 2062.03: Literature of Revolution - The 1920's in Russian Literature

- RUSS 2070.03: Russian Literature and Culture since Stalin's Death
- RUSS 3090.03: Russian Society Today
- RUSS 3092.03: Russian Topics
- RUSS 3096.03: The History of Ideas in Russia - From Official Nationality to Solzhenitsyn's Neo-Slavophilism

11. 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 2001.06: Ethnography in a Global Context
- SOSA 2161.06: Tinker, Tailor, Soldier - Divisions of Labour in a Changing World
- *SOSA 2190.06: Comparative Perspectives on Gender
- *SOSA 2400.06: Health and Illness Across Cultures
- SOSA 2401.06: Food and Nutrition across Cultures
- SOSA 3060.03: Social Change and Development
- SOSA 3201.03: International Human Rights in Social & Cultural Contexts
- *SOSA 3206.03: Ethnicity, Nationalism, and Race
- *SOSA 3211.03: Continuity and Change in Rural Societies
- *SOSA 3231.03: Psychological Anthropology
- SOSA 3310.03: Indian Society: Change and Continuity

12. 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.

- INTD 4211.03 Gender and Development I
- INTD 4212.03: Gender and Development II
- WOST 2200.06: Fictions of Development
- WOST 2400.06: Tinker, Tailor, Soldier - Divisions of Labour in a Changing World
- WOST 2800.06: Comparative Perspectives on Gender
- WOST 3310.03: Gender and Development in Africa
- WOST 4320.03: Feminism, Post Modernism, and Development

A. 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. 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.

B. Seminars and Conferences

All IDS students are encouraged to attend the Killam Lecture Series, as well as the seminar series that are regularly sponsored through the Lester Pearson International, the African Studies IDS Lecture Series, the School of Resource and Environmental Studies, and the Centre for Foreign Policy Studies. 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.

Kinesiology

See School of Health and Human Performance (pg. 148).

Linguistics

Location: Philosophy House
1400 Henry Street
Halifax, NS B3H 3J8
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Dean

Taylor, G.D., BA, PhD (Penn)

Dalhousie Coordinator

Hogan, M. (Philosophy, 494-3548)

Dalhousie Faculty

Barnstead, J., Russian Department, Assistant Professor
Hogan, M., Philosophy Department, Assistant Professor
Furrow, M., English Department, Associate Professor
Gordon, T., French Department, Professor
Maphoho, R., French Department, Assistant Professor
Yoon, M., Psychology Department, Professor

i. Halifax Interuniversity Programme in Linguistics

Halifax area universities are offering a new programme in linguistics to take effect in the academic year 1998-99. Students enrolled in this programme will be able to take classes from St. Mary's and Mount Saint Vincent University to fulfil the requirements for the degree (A letter of permission to do so should be secured from the Registrar's Office at Dalhousie prior to enrolling in such classes. See Letter of Permission, pg. 25). As of the date of the printing of this calendar, the new programme is undergoing the process of approval with Maritime Provinces Higher Education Commission. The programme is described below for those students who wish to be able to plan ahead. Interested students should contact the programme coordinator for more information. Also check our Web page for updates on the programme. It is accessible through Dalhousie's main Web page.

An undergraduate degree in linguistics gives students opportunities to study the formal, functional and systemic nature of language and languages. This is achieved through the study of linguistic theory and through training in methods of linguistic analysis.

Linguistics degrees have many practical applications. Linguistics is directly concerned with the question "what does it mean to know (a) language?". Linguistics provides the groundwork for teaching languages: linguists write the descriptions language teachers use and linguistics provides methods for understanding language learning processes and disorders. Linguistics also provides relevant background for research into sign languages and the development of computer languages. It forms the basis for understanding bilingualism, for language planning in multilingual countries, for developing programmes for increasing literacy, and for enhancing the efficiency of translation services. Linguistics informs literary and cultural studies, and is central in the developing cognitive sciences. It is, of course, also a discipline in its own right which may be studied for its own sake.

The study of language as both a cognitive and social phenomenon entails cognate relationships with an extremely wide array of disciplines. Some of these are suggested by the interdisciplinary nature of the programme. Faculty from Anthropology, English, French, Political Science, Philosophy, Psychology, Sociology and

Womens Studies are participants. Many students will elect to combine linguistics majors with majors in the other areas in which cross-listed and recommended classes are offered.

"Core" classes are offered by the Linguistics Programme through Modern Languages Departments at Saint Mary's and Mount Saint Vincent and the Department of French at Dalhousie.

II. Degree Programmes

Although the Linguistics programme is offered jointly by several universities, the degree is granted by the student's home University. Students must meet the general requirements set by the University in which he or she is registered. Dalhousie students should consult the "Degree Requirements" section of this calendar for specific requirements.

A. Honours In Linguistics

An honours degree is strongly recommended for students who plan to do graduate work in linguistics. Students must have a GPA of 3.0 or better for admission to the honours programme, and must maintain a GPA of 3.0 or better in classes contributing to their honours degree in linguistics.

Interuniversity Programme Requirements

A minimum of 10 credits. These must include:

- FREN 3020.06 or St. Mary's LIN 300, Introduction to Linguistic Analysis, or Mount Saint Vincent's LING 2251 and LING 2252, The Nature of Language and Modern Grammar (one credit);
- Two credits of Phonology, Morphology, Syntax and Semantics (Saint Mary's LIN 310, LIN 320, LIN 330, LIN 340);
- One credit selected with the advice of the programme coordinator. In addition to regularly scheduled linguistics classes, special topics/directed readings, computer language classes and/or intermediate level formal logic classes may be recommended here;
- The equivalent of a second year (intermediate) second or foreign language (one credit)
- Five credits selected from linguistics classes listed below. It is possible to select from linguistics classes offered at other Universities. See the calendars of those Universities or the Dalhousie programme coordinator for a list of acceptable classes.

Students should plan their programmes with attention to the prerequisites for the classes listed below.

B. Combined Honours In Linguistics

Combined honours programmes with Linguistics may be arranged with other departments.

C. Advanced Major In Linguistics

Students who may not be eligible for the Honours Programme are encouraged to enter the Advanced Major degree programme. Consult the programme coordinator.

D. Major In Linguistics

Interuniversity Programme Requirements

A minimum of 6 credits. These must include:

- FREN 3020.06 or St. Mary's LIN 300, Introduction to Linguistic Analysis (one credit) or Mount Saint Vincent's LING 2251 and LING 2252, The Nature of Language and Modern Grammar (two half-credits);
- One credit (two half-credits) selected from Phonology, Morphology, Syntax and Semantics. Students can select from Saint Mary's LIN 310 (half-credit), LIN 320 (half-credit), LIN 330 (half-credit), LIN 340 (half-credit);
- One credit selected with the advice of the programme coordinator. This requirement may be met by regularly scheduled classes listed or cross listed as linguistics classes, by special topics/directed readings classes in linguistics, by second year (intermediate) classes in a language other than the student's first language or in formal logic, or by a computer language class;

- Three credits selected from linguistics classes listed below. It is possible to select from linguistics classes offered at other Universities. See the calendars of those Universities or the Dalhousie programme coordinator for a list of acceptable classes.

Students should plan their programmes with attention to the prerequisites for the classes listed below.

At least two of the six credits must be at or above the 3000 level.

III. Classes Offered at Dalhousie University

See appropriate departmental entry in this calendar for class descriptions.

English

ENGL 3201.06: The English Language

French

- FREN 3020.06: Linguistics
- FREN 4001.03: History of French: The Middle Ages
- FREN 4012.03: Aspects of French Structure
- FREN 4011.03: Lexicology
- FREN 4015.06: Advanced Translation into English

Philosophy

- PHIL 3300.03 Philosophy of Language
- PHIL 4510.03 Topics in the Philosophy of Language

Psychology

- PSYO 2190.03: Psycholinguistics
- PSYO 3052.03: Sensory Neuroscience II. Hearing and Speech
- PSYO 3790.03: Neurolinguistics

Russian

- RUSS 4000.06: The Structure of Contemporary Standard Russian

Sociology and Social Anthropology

- SOSA 3081.03: Sociolinguistics

Marine Biology

Please refer to the Biology departmental entry (pg. 66) for details on the Marine Biology programme.

Mathematics, Statistics & Computing Science

Location: Chase Building
Halifax, NS B3H 3J5
Telephone: (902) 494-2572
Fax: (902) 494-5130

Interim Dean

Ryall, P.J.C., BSc (Dal), MSc (Alta), PhD (Dal)

Chairperson of Department

Gupta, R.P.

Professors Emeriti

Edelstein, M., MSc (Jerusalem), DSc (Technion-Haifa)
Swaminathan, S., MA, MSc, PhD (Madras)
Tingley, A.J., PhD (Minnesota)

Professors

Clements, J.C., MA (UBC), PhD (Tor)
Coley, A.A., PhD (Lond), Killam Professor
Field, C.A., MSc, PhD (Northwestern)
Fillmore, P.A., MSc, PhD (Minnesota), FRSC
Gabor, G., MSc, PhD (Botvos)
Grünenfelder, L.A., PhD (ETH Zurich)
Gupta, R.P., MSc (Agra), PhD (Delhi)
Hamilton, D., MA, PhD (Queen's) (Director of Statistics)
Keast, P., PhD (St. Andrews) (Co-op Director)
Nowakowski, R.J., MSc, PhD (Calg)
Paré, R., MSc, PhD (McG)
Radjavi, H., MA, PhD (Minnesota)
Stewart, P.N., MA (Berkeley), PhD (UBC)
Sutherland, W.R.S., MSc, PhD (Brown)
Tan, K.K., PhD (UBC)
Thompson, A.C., PhD (Newcastle upon Tyne)
Wood, R.J., MSc (McM), PhD (Dal) (Director of Mathematics)

Associate Professors

Brown, J., MSc, PhD (Toronto)
Dilcher, K., MSc, PhD (Queen's)
Johnson, K.P., MSc (Tor), PhD (Brandeis)
Sastri, C.C.A., MSc (Andhra), PhD (New York)
Smith, B., MA (Calgary), PhD (Berkeley)
Thompson, K., PhD (Liverpool) (NSERC University Research Fellow) (jointly with Oceanography)

Assistant Professors

Bowen, K., PhD (California)
Ruan S., PhD (Alta)

Lecturers

Cameron, E., MA (Oxon)

Learning Centre Director

Stevens, P., MSc (Delft)

Statistical Consultant

Blanchard, W., BSc (Dal)

Postdoctoral Fellows

Almudevar, A., PhD (Tor)
Butler, K., PhD (Simon Fraser)

Bradley, D., PhD (Illinois)
Fronk, D., PhD (Utrecht)
Ven Kateswarlu, K., PhD (Madras)

Adjunct Professors

Beattie, M. (MtA)
Bennett, F. (MSVU)
Dawson, R. (SMU)
Hartnell, B. (SMU)
Muir, P. (SMU)
Rahman, M. (DalTech)
Rosebrugh, R. (MtA)
Zhuang, D. (MSVU)

Information concerning programmes and classes in Mathematics follows immediately below. For Statistics, please refer to the corresponding section of this Calendar. For Computer Science, please see the DalTech section of this calendar.

Mathematics

Location: Chase Building
Halifax, NS B3H 3J5
Telephone: (902) 494-2572
Fax: (902) 494-5130

Interim Dean

Ryall, P.J.C., BSc (Dal), MSc (Alta), PhD (Dal)

Director of Division

Nowakowski, R.

Faculty Advisors

Brown, J. (Honours)
Fillmore, P.A. (Graduate)
Keast, P. (Co-op)
Nowakowski, R. (Undergraduate)

I. General Interest Classes

The Division offers several classes for non-majors who would like to know something about Mathematics.

- MATH 1000.03/1010.03: This core calculus class is the starting point for any degree programme in the sciences.
- MATH 1001.03/1002.03: A class designed especially for B.A. students and others who wish to know something about the historical and cultural aspects of mathematics.
- MATH 1060.03: An introduction, through examples drawn from a wide variety of disciplines, to the basic ideas of statistics.
- MATH 1110.03/1120.03: 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.

II. Degree Programmes

One full credit in Mathematics is required for a BSc degree but none of the following classes may be used to satisfy this requirement: MATH 1001.03, 1002.03, 1110.03, 1120.03.

Students should consult the "Degree Requirements" section of this calendar for specific regulations.

A. Honours in Mathematics

Departmental Requirements

2000 level

- MATH 2001.03/2002.03
- MATH 2030.03/2135.03 and 2505.03
- Two and one-half other credits at or above the 2000 level - not including classes listed below.

3000 level

- MATH 3030.06
- MATH 3500.06

4000 level

- Two credits at or above the 4000 level.
- Honours Qualifying Result.

Students may choose programmes with a concentration in Applied Mathematics, Pure Mathematics or Statistics. Students wishing to concentrate in Computer Science should consider Combined Honours in Mathematics and Computer Science, and examine the separate Calendar entry for Computer 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 2

- MATH 2001.03
- MATH 2002.03
- MATH 2030.03
- MATH 2135.03
- MATH 2505.03
- MATH 2060.03
- MATH 2080.03
- MATH 2300.03
- Co-op Seminar
- One elective credit

Year 3

- MATH 3500.06
- MATH 3030.06
- MATH 3110.03
- Two of MATH 3210.03, 3300.03, 3260.03
- An appropriate statistics class
- One and a half elective credits

Year 4

- MATH 4400.03
- The remaining of MATH 3210.03, 3300.03, 3260.03
- An appropriate statistics class
- One and a half mathematics credits at the 4000 level
- Two elective credits

Students wishing to take an Honours degree concentrating in Pure Mathematics are advised to consider a programme similar to the following:

Year 2

- MATH 2001.03
- MATH 2002.03
- MATH 2030.03
- MATH 2135.03
- MATH 2505.03
- $\frac{1}{2}$ mathematics credit;
- 2 elective credits

Year 3

- MATH 3500.06
- MATH 3030.06
- 1 mathematics credit
- 2 elective credits

Year 4

- MATH 4010.03
- MATH 4140.03
- 3 mathematics credits, at least one of which is at the 4000 level;
- 1 elective credit.

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 STAT 8880.00.

B. Combined Honours

Students interested in taking honours in mathematics and another subject as a combined programme should consult the Mathematics Honours Faculty Advisor. Combined programmes in areas such as

Mathematics and Statistics, Mathematics and Computer Science, Mathematics and Physics, Mathematics and Chemistry and Mathematics and Economics are common, but combined programmes with Mathematics and any subject in the Faculty of Science or Faculty of Arts and Social Science can be arranged. These programmes must satisfy University Regulations, but are designed to satisfy the interests and needs of the student.

A combined honours programme may be appropriate for many. Students contemplating a combined honours course in Mathematics 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.

C. Advanced Major and Major in Mathematics

Departmental Requirements - Advanced Major

2000 level

- MATH 2001.03/2002.03
- MATH 2030.03
- MATH 2040.03 (or 2135.03).
- One other mathematics credit at or above 2000 level - not including classes listed below.

3000 level

- Three mathematics credits at or above the 3000 level

Departmental Requirements - Major

2000 level

- MATH 2001.03/2002.03
- MATH 2030.03
- MATH 2040.03 (or 2135.03)

3000 level

- Two credits at or above the 3000 level

Majors in Mathematics are strongly urged to include CSCI 1100.03, 1101.03 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.

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.

D. 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 and statistics 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 $\frac{1}{2}$ years. The co-op programmes are available either as an Advanced Major (20-credit) degree programme or as an Honours degree programme. Entry to either co-op programme (Advanced Major or Honours) is restricted to students with a GPA of B overall, and B⁺ in the Major.

There are three Advanced Major Co-op programmes; one in each division of the Department.

There are three Honours Co-op programmes available within this Department, in the areas of:

- Mathematics
- Mathematics and Computer Science combined
- Statistics

A Combined Honours Co-op degree, combining Mathematics or Computer 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.

Departmental Requirements - Honours

Classes required for Honours Co-op:

Same as for regular Honours in Mathematics as above with the addition of the following:

- 4 Co-op Work-Terms: MATH 8891.00, 8892.00, 8893.00, 8894.00
- Co-op Seminar: SCIE 8700.00

Departmental Requirements - Advanced Major Co-op

Same as for regular Advanced Major in Mathematics as above with the addition of the following:

- 4 Co-op Work-Terms: MATH 8891.00, 8892.00, 8893.00, 8894.00
- Co-op Seminar: SCIE 8700.00

III. Classes Offered

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 0009.00: Mathematical Foundations.

This non-credit class is intended for those students who have basic mathematical skills (including grade 10 level) and want to develop them to the university level necessary for entrance to the Bachelor of Commerce or Bachelor of Nursing programmes. The class begins with a review of algebra and investigates linear, quadratic, exponential and logarithmic functions. Emphasis is placed on their description and application. Other areas of study include: problem solving skills, systems of linear equations, matrices, basic statistics and data analysis.

FORMAT: Lecture 3 hours, tutorial 1 hour

PREREQUISITES: Students are encouraged to complete a diagnostic questionnaire which will identify their mathematical skills

MATH 0010.00: Pre-Calculus Mathematics (NS Math 441).

This class has been designed for students who have completed academic high school mathematics but need to upgrade their skills in order to take calculus. Successful completion of this full year non-credit class enables one to pursue university mathematics and science courses. The class begins with an overview of functions and investigates, in detail, linear, quadratic, inverse, polynomial, rational, exponential, logarithmic and trigonometric functions.

FORMAT: Lecture 3 hours, tutorial 1 hour

PREREQUISITES: Grade 11 science mathematics, grade 12 arts mathematics or equivalent. Students are encouraged to complete a diagnostic questionnaire which will identify their mathematical skills

MATH 0050.00: Accelerated Preparation for MATH 1000.03.

This one term non-credit class has been designed for students whose results on the placement test for MATH1000.03 require improvement. Emphasis is placed on the algebra, geometry and trigonometry required for calculus. Students register and pay for MATH 0050.00A at Henson College, 6100 University Avenue.

FORMAT: Lecture 3 hours, tutorial 1 hour

PREREQUISITE: N.S. Mathematics 441 or equivalent or recommendation of Department of Mathematics, Statistics & Computer Science

NOTE: MATH 1000.03 and MATH 1010.03 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. 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 1000.03: Differential and Integral Calculus.

Students enrolled in MATH 1000.03 are required to take a placement test in the first week of classes to determine whether they may proceed with the class and if so, in which stream. This class offers 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 MATH 1010.03.

FORMAT: Lecture 3 hours, tutorial 1 hour, MLC

PREREQUISITE: Nova Scotia Mathematics 441 or equivalent

*MATH 1001.03: 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

*MATH 1002.03: Mathematics for Liberal Arts Students II.

Same as 1001.03 above, but with a different set of topics. Either one or both of 1001.03 and 1002.03 may be taken for credit. This class cannot be used to satisfy the BSc mathematics requirement.

FORMAT: Lecture 3 hours, MLC

MATH 1010.03: 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

PREREQUISITE: MATH 1000.03

MATH 1060.03: Introductory Statistics for Science and Health Sciences.

See class description for STAT 1060.03 in the Statistics section of this calendar.

MATH 1110.03: 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 1100.06. 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 1120.03: 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 1100.06. 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: MATH 1120.03 credit cannot be given to those who have already received credit for MATH 1000.03

MATH 1670.03: Discrete Structures I.

This class together with MATH 2670.03 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 Computer Science.

FORMAT: Lecture 3 hours

PREREQUISITE: Nova Scotia Mathematics 441 or equivalent

CROSS-LISTING: CSCI 2112.03

EXCLUSION: COMP 1670.03

MATH 2001.03/2002.03: Intermediate Calculus I and II.

The topics of these two 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: MATH 1010.03

EXCLUSION: Credit will be given for only one of the following combinations: MATH 2001.03 and 2002.03 or MATH 2480.03 and 2490.03.

MATH 2030.03: Matrix Theory and Linear Algebra I.

This class, together with MATH 2040.03, is a self-contained introduction to Matrix Theory and Linear Algebra. Topics include: vector spaces, linear transformations, determinants, systems of linear equations. About twenty percent of this class will be devoted to learning to use an appropriate computer package. 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 MATH 1000.03 is expected.

FORMAT: Lecture 3 hours, MLC

PREREQUISITE: Nova Scotia Mathematics 441 or equivalent

MATH 2040.03: Matrix Theory and Linear Algebra II.

This class is a continuation of Mathematics 2030.03. Topics include: similarity, diagonalization, inner product spaces.

FORMAT: Lecture 3 hours, MLC

PREREQUISITES: MATH 2030.03 and 1000.03

EXCLUSION: MATH 2135.03

***MATH 2051.03: Problems in Geometry.**

A half class on such material from MATH 2050.06 as time permits.

FORMAT: Lecture 3 hours

PREREQUISITE: MATH 1010.03

EXCLUSION: Credit can be given for only one of MATH 2050.06 and MATH 2051.03.

MATH 2060.03: Introduction to Probability and Statistics I.

See class description for STAT 2060.03 in the Statistics section of this calendar.

MATH 2080.03: Statistical Methods For Data Analysis & Inference.

See class description for STAT 2080.03 in the Statistics section of this calendar.

MATH 2135.03: Linear Algebra.

This class is a continuation of MATH 2030.03. Topics include: similarity, diagonalization, inner product spaces. It is intended for honours students only.

FORMAT: Lecture 3 hours

PREREQUISITE: MATH 2030.03

EXCLUSIONS: MATH 2040.03

MATH 2300.03: 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

CO-REQUISITE: MATH 2030.03 and MATH 1000.03

CROSS-LISTING: STAT 2300.03

MATH 2505.03: Introductory Analysis.

For honours students and other serious students of mathematics. Topics include: the axioms for the real number system, geometry and topology of Euclidean space, limits, continuity, differentiability, the inverse and implicit function theorems.

FORMAT: Lecture 3 hours

PREREQUISITE: MATH 2001.03

***MATH 2540.03: 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: MATH 1000.03

***MATH 2600.03: 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: MATH 1010.03 or 1110.03

CROSS-LISTING: STAT 2600.03

MATH 2670.03: Discrete Structures II.

See class description for CSCI 2113.03 in the Computer Science section of this calendar.

MATH 3030.06: 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: MATH 2040.03 or 2135.03

***MATH 3070.03: 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: MATH 2040.03 (or 2135.03)

***MATH 3080.03: 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: MATH 2002.03

MATH 3090.03: 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 2002.03 and MATH 2030.03

EXCLUSION: MATH 3500.06

MATH 3100.03: 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: MATH 3090.03

EXCLUSION: MATH 3500.06

MATH 3110.03: 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

PREREQUISITE: MATH 2002.03

MATH 3120.03: 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

PREREQUISITE: MATH 3110.03

***MATH 3170.03: Introduction to Numerical Linear Algebra.**

See class description for CSCI 3111.03, in the Computer Science section of this calendar.

***MATH 3210.03: 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

PREREQUISITE: Instructor's permission

MATH 3260.03: 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 procession 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 3110.03 (may be taken concurrently)

MATH 3300.03: 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: MATH 2002.03 and 2040.03

MATH 3310.03: Optimization II.

This class continues the study of the topics in MATH 3300.03. 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

PREREQUISITE: MATH 3300.03

***MATH 3340.03: Regression and Analysis of Variance.**

See class description for STAT 3340.03, in the Statistics section of this calendar.

***MATH 3360.03: Probability.**

See class description for STAT 3360.03, in the Statistics section of this calendar.

***MATH 3380.03: Sample Survey Methods.**

See class description for STAT 3380.03, in the Statistics section of this calendar.

***MATH 3460.03: Intermediate Statistical Theory.**

See class description for STAT 3460.03 in the Statistics section of this calendar.

MATH 3500.06: Intermediate Analysis.

MATH 3500.06 continues the analysis sequence begun in MATH 2505.03. 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, extrema, co-ordinate transformations.

FORMAT: Lecture 3 hours

PREREQUISITES: MATH 2135.03, 2505.03

EXCLUSIONS: MATH 3090.03 and 3100.03

MATH 4010.03: 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: MATH 3500.06
CROSS-LISTING: MATH 5010.03

*MATH 4025.03: 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 3030.06 or equivalent
CROSS-LISTING: MATH 5025.03

*MATH 4045.03: 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
PREREQUISITE: MATH 3030.06
CROSS-LISTING: MATH 5045.03

*MATH 4055.03: Advanced Algebra II.

Topics may include: Algebras over a field, classical representation theory of groups and algebras, lattices, Boolean algebra. Additional topics may be covered at the discretion of the instructor.

FORMAT: Lecture 3 hours
PREREQUISITE: MATH 3030.06
CROSS-LISTING: MATH 5055.03

*MATH 4065.03: Algebraic Geometry.

An introduction to the basic concepts of algebraic geometry.

FORMAT: Lecture 3 hours
PREREQUISITE: MATH 3030.06
CROSS-LISTING: MATH 5065.03

*MATH 4070.03: Topics in Number Theory.

The class 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
PREREQUISITE: MATH 3070.03
CROSS-LISTING: MATH 5070.03

*MATH 4090.03: 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 3360.03 and a third year analysis class
CROSS-LISTING: MATH 5090.03, STAT 4090.03/5090.03

*MATH 4130.03: Analysis of Algorithms.

See class description for CSCI 4113.03 in the Computer Science section of this calendar.

*MATH 4135.03: 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
PREREQUISITE: MATH 3030.06 or permission of the instructor.
CROSS-LISTING: MATH 5135.03

*MATH 4140.03: 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: MATH 2135.03 and 3040.03 or 3500.06
CROSS-LISTING: MATH 5140.03

*MATH 4160.03: 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: MATH 4010.03 and 4140.03
CROSS-LISTING: MATH 5160.03

*MATH 4170.03: 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: MATH 3040.03 or 3500.06
CROSS-LISTING: MATH 5170.03

*MATH 4180.03: 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
PREREQUISITE: MATH 4170.03
CROSS-LISTING: MATH 5180.03

*MATH 4190.03: Differential Equations.

Mathematics 3120.03 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: MATH 3500.06 (3090.03 and 3100.03) and 2030.03/2040.03 or 2135.03
CROSS-LISTING: MATH 5190.03

*MATH 4200.03: 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 analyzed. The precise topics and equations covered depend on the specific interests of the instructor and the students.

FORMAT: Lecture 3 hours
PREREQUISITE: MATH 4190.03
CROSS-LISTING: MATH 5200.03

*MATH 4220.03: 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: MATH 3110.03
CROSS-LISTING: MATH 5220.03

*MATH 4230.03: Partial Differential Equations.

This class continues the study of partial differential equations begun in MATH 4220.03. 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: MATH 4220.03
CROSS-LISTING: MATH 5230.03

*MATH 4270.03: Numerical Software.

The design and implementation of reliable programmes and libraries for numerical computation are the focus of this class. Available programme libraries such as NAG and software packages available on netlib are reviewed. Particular attention is paid to the choice of subroutine parameters and the tradeoffs between convenience, simplicity and generality.

FORMAT: Lecture 3 hours
PREREQUISITE: MATH 3170.03 (with a grade of C- or better)
CROSS-LISTING: MATH 5270.03

*MATH 4300.03: 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: MATH 3110.03 and MATH 3090.03
CROSS-LISTING: MATH 5300.03

*MATH 4310.03: 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 3500.06 (or 3090.03 and 3100.03) and 2135.03 (or 2040.03)
CROSS-LISTING: MATH 5310.03

MATH 4330.03: Topics In Graph Theory.

This class is intended for math and computer science students. Items to be selected from the following topics: graphs and matrices, graphs and groups, network analysis, extremal graph theory, enumeration problems, algebraic methods in graph theory.

FORMAT: Lecture 3 hours
PREREQUISITES: MATH 2000.06 and 2040.03
CROSS-LISTING: MATH 5330.03

*MATH 4400.03: Mathematical Modelling III.

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
PREREQUISITE: MATH 3110.03
RECOMMENDED: MATH 3120.03
CROSS-LISTING: MATH 5400.03

MATH 4410.03: Cosmology.

A self-contained introduction to cosmology will be given and no prior knowledge of differential geometry or general relativity will be assumed (although some knowledge of elementary differential equations will be useful). A cosmological model is a model of the universe, as a whole, on the largest scales; the emphasis of the class will be on the modelling aspects of cosmology.

FORMAT: Lecture 3 hours
PREREQUISITE: Instructor's permission
CROSS-LISTING: MATH 5410.03, PHYC 4660.03/5660.03

MATH 4650.03: General Relativity.

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
PREREQUISITE: MATH 3050.06 or permission of the instructor.
CROSS-LISTING: MATH 5650.03, PHYC 4650.03/5650.03

*MATH 4660.03: Automata and Computability.

See class description for CSCI 4660.03, in the Computer Science section of this calendar.

MATH 4670.03: Computer Algebra.

The course will develop the algebraic basis for a symbolic computation system such as MAPLE or Mathematica. The basic topics covered will be: algorithms for the arithmetic of integers and single variable polynomials, multivariable polynomials and systems of polynomial equations, the Grobner Bases Theorem, Buchbergers Algorithm. In addition one advanced topic such as integration algorithms for elementary functions or the symbolic computation of Galois Groups will be explored.

FORMAT: Lecture 3 hours
PREREQUISITE: MATH 3030.06

MATH 4800.03: Introduction to Mathematical Research.

This class is intended to introduce students to the science and methodology of research in the mathematical sciences. The class will be organized around topics from a wide spectrum of mathematics from which students will be guided to investigate open problems. Conjectures will be formulated and evidence will be developed. Computational tools (such as Maple V) will be incorporated for both pure and applied problems. This class will also introduce students to methods for searching the research literature. Students will be expected to record their work in personal journals that are typeset in LaTeX.

FORMAT: Lecture 3 hours
PREREQUISITE: MATH 2002.03, 2040.03 or 2135.03; MATH 3030.03 or permission of the instructor
CROSS-LISTING: MATH 5800.03

MATH 4900.03: Classical and Combinatorial Game Theory.

This is an introduction to Classical Game Theory found in economics, biology and politics and to Combinatorial Game Theory. Classical game theory topics will include analysis of two person games, both zero sum and non-zero sum with examples and applications taken from economics and biology; and also n person

games covering imputations, core, von Neumann - Morgenstern solutions and Shapley Vectors. The Combinatorial Game Theory will cover the Sprague-Grundy analysis of Impartial Games both normal and misere; Conway's number system and the canonical form of a Partizan Game, the cooling and heating of such games and the reduced canonical forms. Examples will be taken from such games as Chess, Go and Domineering.

PREREQUISITES: MATH 2030.03/2040.03, 2001.03/2002.03

CROSS-LISTING: MATH 5900.03

MATH 8891.00: Co-op Work-Term I

PREREQUISITE: SCIE 8700.00

MATH 8892.00: Co-op Work-Term II

PREREQUISITE: MATH 8891.00

MATH 8893.00: Co-op Work-Term III

PREREQUISITE: MATH 8892.00

MATH 8894.00: Co-op Work-Term IV

PREREQUISITE: MATH 8893.00

SCIE 3000.06: 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.

SCIE 8700.00: Co-op Seminar.

This seminar is used to prepare Co-op students for their work-term experience. It is a prerequisite for the first work-term.

Microbiology and Immunology

Location: Sir Charles Tupper Medical Building
Halifax, NS B3H 4H7
Telephone: (902) 494-3587
Fax: (902) 494-5125

Interim Dean

Ryall, P.J.C., BSc (Dal), MSc (Alta), PhD (Dal)

Head of Department

Johnston, G.C.

Undergraduate Advisors

Barnes, C. (494-2123)
Hoskin, D.W. (494-6509)
Stoltz, D. (494-2590)

Professors

Anderson, R., PhD (Cologne), Graduate Studies Coordinator, (Viral Pathogenesis)
Hoffman, P.S., PhD (Virginia Polytech.), (Microbial Pathogenesis)
Issekutz, T.B., MD (Dal), FRCP(C), Prof., Pediatrics (Lymphocytes in Autoimmune Disease)
Johnston, G.C., PhD (York), (Molecular Genetics: Regulation of Proliferation)
Lee, S.H.S., PhD (Dal), (Diagnostic Virology; Interferon)
Lee, T., PhD (Glasgow) (Molecular Immunology; Transplantation Immunology)
Mahony, D.E., PhD (McG), (Bacteriology; Bacteriocins, Toxins and Plasmids of Clostridia)
Stoltz, D.B., PhD (McM), (Biology of Parasitic Insects; Polydnnaviruses)
Stuttard, C., PhD (Dublin), (Microbial Genetics)

Associate Professors

Carr, R.L., MD (Tor), PhD (Rockefeller), Prof., Medicine (Rheumatology) (Immunoregulation; CNS Immune System Interactions and Auto Immune Diseases)
Duncan, R., PhD (Guelph) (Molecular Virology)
Forward, K.R., MD (Memorial), FRCP(C), Pathology (Antimicrobial Resistance; Clinical Diagnostic Microbiology)
Hoskin, D.W., PhD (McG) (Tumour Immunology; MHC-Unrestricted Killer Cells)
Issekutz, A.C., MD (Dal), FRCP(C), Prof., Pediatrics (Inflammation)
Lee, S.F., PhD (Guelph) (Oral Microbiology; Microbial Pathogenesis)
Marshall, J.S., PhD (Manchester) (Mast Cells in Inflammation and Cancer)
Rajaraman, R., PhD (Dal), Asst. Prof., Medicine (Programmed Cell Death in Neoplasia)

Assistant Professors

Barnes, C., BA, PhD (Dal), Molecular Genetics
Carpenter, M.S., PhD (Manitoba) (Enterovirus Replication and Evolution)
Faulkner, G., PhD (Dal) (Ultrastructural Analysis of Infection and Cancer Cells)
Haldane, D.J.M., MBChB (Dundee), FRCP(C) (Medical Microbiology)
Kennedy, W.A., MDCM (McG), FRCP(C), Pediatrics (Parainfluenza and Coronavirus Respiratory Tract Infection Pathogenesis)
Srnadnyk, A.W., PhD (McM) (Intestinal Inflammation; Cytokines)

Instructor

Murray, L.E., PhD (Dal) (Molecular Genetics)

I. 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 recombinant DNA methods (genetic engineering).

They can be taken along with classes in metabolism, enzymology, bacteriology, virology and immunology and provide a good practical grounding for 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 for students interested in fundamental questions in molecular immunology, tumour immunology, autoimmunity or inflammation, and defences against microbial infection.

These programmes provide the education needed for professional activities after graduation or for graduate studies in microbiology or immunology.

II. Degree Programmes

There is a 4-year "advanced major" programme in Microbiology but no 3-year programme leading to a Microbiology major. MICR 2100.03 is a prerequisite for most other microbiology classes offered in this Department. Students interested in an honours programme (see below) should consult a departmental advisor, 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.

Students should consult the "Degree Requirements" section of this calendar for specific regulations.

A. BSc with Honours in Microbiology and Immunology

This programme is designed to give students the best possible preparation 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 1000.06 or BIOL 1001.06 or SCIE 1500.30 (Science Foundation Year) and must, in their 2nd year, obtain a grade of B- or better in MICR 2100.03. Students should consult an undergraduate advisor at their earliest convenience.

Departmental Core Requirements

1000 level

- BIOL 1000.06
- CHEM 1011.03 and 1012.03
- Two of the following: MATH 1000.03, 1010.03 or 1060.03

2000 level

- MICR 2100.03
- BIOL 2020.03
- BIOL 2030.03

- BIOC 2200.03
- CHEM 2401.03
- CHEM 2402.03

3000 level

- BIOC 3400.03
- MICR 3033.03
- MICR 3114.03
- MICR 3115.03
- MICR 3118.03 (or BIOL 3113.03 or BIOL 4113.03)

4000 level

- MICR 4900.06

Two and one-half additional credits (to make a total of 9) are to be taken from the list provided below (the classes listed are all considered to belong to the discipline of microbiology and/or immunology):

- MICR 3033.03, 3114.03, 3115.03, 3118.03, 4024.03, 4026.03, 4027.03, 4037.03, 4103.03, 4114.03, 4115.03, 4118.03, 4301.03, 4302.03, 4303.03, 4601.03, 4602.03, 5038.03.
- BIOC 4403.03, 4404.03, 4501.03, 4502.03, 4603.03, 4802.06
- BIOL 2101.03, 3100.03, 3113.03, 4101.03, 4113.03

For students wishing to specialize in molecular genetics, the following classes (in addition to the core) are strongly recommended: MICR 4037.03/MICR 5038.03, MICR 4118.03, MICR 4403.03, MICR 4404.03 and MICR 4601.03. Students should also consult an undergraduate advisor.

For students wishing to specialize in the area of immunology the following classes are recommended: MICR 3033.03, 3115.03, 4115.03; BIOC 3200.03, MICR 4301.03, 4302.03, 4303.03, 4601.03, 4602.03. Immunology students should consult the Immunology undergraduate advisor, Dr. D.W. Hoskin.

For students wishing to specialize in virology, the following classes (in addition to the core) are recommended: BIOC 3200.03, BIOL 3020.03 or MICR 4026.03, MICR 4114.03, MICR 4115.03, MICR 4118.03, MICR 4403.03, MICR 4404.03 and MICR 4601.03.

Notes:

1. In the 4 half-credit classes taken at the 3000-4000 level to fulfill the core subjects requirement (bacteriology, virology, immunology and microbial genetics), 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 4900.06) 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 to the interests of the Department. Similarly, it should be noted that Biology majors may conduct their honours thesis project (i.e., BIOL 4900.06) in this Department.
4. Students should be aware of Academic Regulation 19. 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. If you do not meet the prerequisites listed for a class (or fail to obtain permission from an instructor), the Registrar's Office will be informed and your name will be deleted from the class list.

B. BSc with Combined Honours in Microbiology and Immunology and Biochemistry

Students in this programme must complete 11 credits above the 1000 level in Microbiology and Biochemistry; students are eligible to participate in a work co-op programme.

Departmental Requirements

- BIOC 2200.03
- BIOC 3200.03
- BIOC 3300.03
- BIOC 3400.03
- BIOC 4603.03

- Two credits in the 4 defined core subject areas in Microbiology and Immunology (MICR 3033.03, 3114.03, 3115.03 and 3118.03 or alternates)
- MICR 2100.03 (or BIOL 2101.03)
- BIOL 2020.03
- BIOL 2030.03
- CHEM 2401.03 and 2402.03
- Either MICR 4900.06 or BIOC 4602.06 (either of which, with approval, can be carried out in either department).
- The remaining 3 credits must include at least 1 full credit from each Department at the 4000 level (excluding MICR 4900.06 and BIOL 4602.06).

The Department, in collaboration with the Department of Biochemistry, has coordinated a Medical Biotechnology stream in the Combined Honours programme. This stream is designed to optimally prepare those seeking a career in Biotechnology in general and Medical Biotechnology in particular.

In addition to the above requirements, students must take:

- BIOC 4501.03
- BIOC 4502.03
- CHEM 2201.03
- CHEM 2303.03
- MICR 4602.03
- MATH 1060.03
- One additional full credit from Microbiology and Immunology at the 4000 level and an additional one-half credit from either Department.

C. BSc with Combined Honours in Microbiology and Immunology 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-. BIOL 1000.06 or BIOL 1001.06 should be taken in year 1, and MICR 2100.03 in year 2. Research thesis work can be carried out in either Department.

Advisors: D.W. Hoskin and D.B. Stoltz (Microbiology and Immunology); J. Wright (Biology).

D. Advanced Major in Microbiology and Immunology

Departmental Requirements

1000 level

- BIOL 1000.06 or 1001.06
- CHEM 1011.03 and 1012.03

2000 level

- Three credits at or above the 2000 level (including MICR 2100.03, BIOL 2020.03, BIOL 2030.03, BIOC 2200.03, CHEM 2441.03)

3000 level

- Three additional credits at or above the 3000 level (including BIOC 3400.03, MICR 3033.03, MICR 3114.03, MICR 3115.03 and MICR 3118.03 or alternates)

III. 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 continued admission.

MICR 1050.03: General Microbiology.

This class is geared to students in pharmacy. Microbiology is taught over a three-week period by way of tutorials, lectures and laboratory sessions. It addresses some basic principles of microbial structure, physiology and genetics in relation to microbial pathogenesis. General concepts and practices of sterilization with disinfection, antibiotics and immunity will be discussed. Laboratory sessions using demonstrations 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: Case-oriented problem solving (COPS) learning

PREREQUISITE: BIOL 1000.06 or instructor's consent

MICR 1100.03: Health Science Microbiology.

See class description in Nursing section of this calendar. **NOTE:** Students registering in this class must also register for either a morning or afternoon laboratory session.

MICR 1200.03: Introduction to General and Oral Microbiology.

See class description in the Dental Hygiene section of the Dentistry, Law and Medicine Calendar.

MICR 2020.03: General Microbiology.

This class is geared to students in physiotherapy. 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, immunity and epidemiology will be discussed. Bacterial, fungal, parasitic and viral pathogens of medical importance as well as water-borne and air-borne infection will be discussed with respect to transmission, clinical features, prevention and chemotherapy.

NOTE: MICR 2020.03 cannot be taken for credit in a BSc programme.

INSTRUCTOR: S.H.S. Lee

FORMAT: Lecture 3 hours

PREREQUISITE: BIOL 1000.06 or instructor's consent

CROSS-LISTING: PHYT 2070.03

MICR 2100.03: Introductory Microbiology and Immunology.

An introduction to the basic concepts of microbiology and immunology through lectures, laboratory sessions and demonstrations. Topics include the structure, genetics and life cycles of microorganisms and viruses, as well as basic immunology. This is normally a required class for Microbiology and Immunology honours students; as such, it is directed primarily to second year students. In fact, roughly three out of four laboratory spaces will normally be reserved for second year students. **NOTE:** Students who have taken (or are taking) any of MICR 3033.03, 3114.03 or 3115.03 will not normally be permitted to register in MICR 2100.03. 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**. Students wishing to repeat the class must have approval to do so from the class coordinator. MICR 2100.03 is the preferred route into other microbiology offerings.

INSTRUCTORS: D.B. Stoltz, T. Lee, G. Johnston

FORMAT: Lecture 2 hours, lab 3 hours

PREREQUISITE: Grade of B or better in BIOL 1000.06 or BIOL 1001.06.

NOTE: Biology students taking BIOL 2101.03 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 3033.03: 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).

INSTRUCTOR: C. Barnes

FORMAT: Lecture 3 hours

PREREQUISITES: Minimum grade of B in MICR 2100.03 or BIOL 2101.03, BIOL 2030.03, BIOC 3400.03; or instructor's consent

MICR 3114.03: Virology.

Viruses are extremely efficient nucleoprotein complexes 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 2200.03, BIOL 2020.03, BIOL 2030.03 and complements material presented in other classes such as immunology, cell biology, biochemistry, molecular biology and gene expression.

INSTRUCTORS: R. Duncan, D.B. Stoltz, R. Anderson

FORMAT: Lecture 3 hours

PREREQUISITES: Normally includes all of MICR 2100.03 (or BIOL 2101.03 with a grade of B or better), BIOC 2200.03, BIOL 2020.03 and BIOL 2030.03

MICR 3115.03: 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.

INSTRUCTORS: D.W. Hoskin or T. Lee

FORMAT: Lecture 3 hours

PREREQUISITES: MICR 2100.03 (or BIOL 2101.03 with a grade of B or better) plus a 2000-level class in cell biology, or instructor's consent

MICR 3118.03: Medical Bacteriology.

This class is designed to give a strong background in medical bacteriology. Lectures address the identification and typing of bacterial pathogens, mechanisms of disease transmission, toxins and antibiotics, and provides a detailed survey of most bacterial pathogens. Laboratory sessions, supplemented with computer software, complement the lecture topics and focus on the identification of select groups of bacteria of medical significance.

INSTRUCTORS: D.E. Mahony, G.S. Bezanson

FORMAT: Lecture 2 hours, lab 3 hours

PREREQUISITE: Minimum grade of B- in MICR 2100.03 or BIOL 2101.03

MICR 4024.03: 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, 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.

INSTRUCTORS: G.T. Faulkner, D.B. Stoltz, G. Rowden

FORMAT: Lecture 2 hours, lab 3 hours

PREREQUISITE: Instructor's consent

CROSS-LISTING: BIOL 4024.03/5024.03, MICR 5024.03

MICR 4026.03: The Mammalian Cell as a Microorganism.

This class consists of lectures and student participation by way of giving seminars on recent development and by writing term papers on emerging concepts. The lectures deal with recent advances and developing concepts in cellular and molecular biology with reference to the mammalian cell cultured in vitro. The following general areas are discussed in detail: the mammalian cell as a microorganism, nuclear matrix, cytoplasmic, extracellular matrix, cell adhesion receptors, growth factors and their receptors, signal transduction, replicative senescence in vitro and aging in vivo, gene

expression, cell cycle and differentiation, cell death, selection systems, hybridoma technology, experimental mutagenesis, somatic cellular and molecular genetics, gene mapping, gene therapy, molecular biology in diagnosis and therapy.

INSTRUCTORS: R. Rajaraman, L.A.V. Fernandez

FORMAT: Lecture 3 hours

PREREQUISITE: BIOL 2030.03 or BIOL 2020.03 or instructor's consent

CROSS-LISTING: MICR 5026.03

MICR 4027.03: Molecular Mechanisms of Cancer.

The class considers recent advances in 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 developing concepts. The following areas are discussed: properties of a cancer cell and types of tumors, chemical carcinogens, mechanisms of chemical, radiation and viral induced carcinogenesis, chemoprevention of cancer, oncogenes and protooncogenes, oncogenes and signal transduction, cytogenetics and genetics of cancer, tumor suppressor genes, tumor susceptibility genes, multistep carcinogenesis, apoptosis in cancer, hematopoietic malignancies, diagnostic uses of oncogenes, tumor immunology, and immunotherapy, chemotherapy, radiation therapy, cytokine therapy, and gene therapy of cancer and the cellular basis of metastasis.

INSTRUCTORS: R. Rajaraman, D. Guernsey, W. Greer, C. Riddell, L.A.V. Fernandez, M.M. Rajaraman

FORMAT: Lecture/seminar 3 hours

PREREQUISITE: MICR 4026.03 or instructor's consent

CROSS-LISTING: MICR 5027.03, PATH 5027.03

MICR 4103.03: Infectious Diseases of Aquatic Organisms.

See class description for BIOL 4103.03 in the Biology section of this calendar.

MICR 4114.03: Advanced Topics in Molecular and Medical Virology.

A class for advanced students designed to look in detail at selected aspects of molecular and medical virology. The class is based on student presentation of current literature, in combination with introductory lectures and paper discussions. This class, in combination with the virology lab module from MICR 4601.03R, offers students a look at the leading edge of virus research.

INSTRUCTORS: R. Duncan, D.B. Stoltz, R. Anderson, M. Carpenter

FORMAT: Lecture/presentation/discussion 3 hours

PREREQUISITE: Grade of B⁺ or better in MICR 3114.03 and instructor's consent

CROSS-LISTING: MICR 5114.03

MICR 4115.03: 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. Hoskin

FORMAT: Lecture/discussion 3 hours

PREREQUISITES: Minimum grade of B+ in MICR 3115.03 and instructor's consent

CROSS-LISTING: MICR 5115.03

MICR 4118.03: 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

PREREQUISITES: MICR 3033.03 plus an advanced class in Bacteriology (MICR 3118.03 preferred)

CROSS-LISTING: MICR 5118.03

MICR 4301.03: Immunobiology.

An advanced class designed to examine the experimental approaches which have led and are leading to our knowledge of the biological characteristics of the immune system. We will look at the cells involved and the interactions between them, focusing on "hot topics" in antigen processing and presentation, the idiotype network, immunological tolerance and approaches to inducing it when the immune system causes disease, and the interactions between the mucosal immune system and the systemic immune system, normal and pathological autoimmunity, organ transplantation, and CNS immune system interactions. The end of the class (last two weeks) will focus on some "superhot" topics.

INSTRUCTOR: R. Carr

FORMAT: Lecture, student presentation, discussion

PREREQUISITES: MICR 3115.03 or instructor's consent

CROSS-LISTING: MICR 5301.03

MICR 4302.03: Molecular Immunology.

An advanced class which investigates the molecules involved in the generation and expression of immune responses. Topics typically include the 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. This class alternates yearly with MICR 4303.03.

INSTRUCTORS: T. Lee, A.W. Stadnyk

FORMAT: Lecture, student presentations, discussion

PREREQUISITES: MICR 3115.03 and instructor's consent

CROSS-LISTING: BIOL 4302.03/5302.03, MICR 5302.03

MICR 4303.03: Granulocytes and the Immune Response.

An advanced class dealing with the contribution of granulocytes to immunologic function. Mast cells, basophils, neutrophils, macrophages, NK cells and eosinophils will be considered with respect to their unique functions and contribution to a variety of immune effector mechanisms. This class alternates yearly with MICR 4302.03. (Not offered in 1998/99.)

SIGNATURE REQUIRED

INSTRUCTORS: T. Lee, A.W. Stadnyk

FORMAT: Lecture, student presentations, discussion

PREREQUISITES: MICR 3115.03 and instructor's consent

CROSS-LISTING: BIOL 4303.03/5303.03, MICR 5303.03

MICR 4403.03: Genes and Genomes.

See class description for BIOC 4403.03 in the Biochemistry section of this calendar.

MICR 4404.03: Gene Expression.

See class description for BIOC 4404.03 in the Biochemistry section of this calendar.

MICR 4601.03: Laboratory Techniques in Molecular Biology I.

The class will consist of a series of laboratory modules (each of 4 weeks' duration, 1 day per week or 72 hours total, with limited 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, immunology, 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 3400.03

CROSS-LISTING: BIOL 4012.03/5012.03, BIOC 5603.03, MICR 4601.03

MICR 4602.03: Laboratory Techniques In Molecular Biology II.

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. The three modules offered are: cloning and expression in Baculovirus; molecular genetics; and immunochemistry. Students should consult with the class coordinator regarding eligibility and availability of space.

INSTRUCTOR: L.E. Murray

FORMAT: Lab 6 hours

CROSS-LISTING: MICR 5602.03

MICR 4700.06: Directed Research Project.

This class is in most respects equivalent to MICR 4900.06. Students are required to spend at least one day per week performing laboratory research. A final report on the research project must be submitted at the end of the academic year.

INSTRUCTOR: D.W. Hoskin

FORMAT: Lab 1 day per week

PREREQUISITES: Permission of the Undergraduate Studies

Committee and a member of the Department who will serve as a supervisor. At least a B average for MICR 3033.03, 3114.03, 3115.03 and 3118.03 (or equivalent)

MICR 4701.03/4702.03: Advanced Topics in Microbiology and Immunology.

This is an independent studies class intended to permit further study of a specific topic of interest, or to correct a deficiency in a student's programme.

INSTRUCTOR: D.W. Hoskin

FORMAT: Independent study

PREREQUISITES: Permission of the Undergraduate Studies

Committee and a member of the Department who will supervise the independent study programme.

MICR 4900.06: Honours Research and Thesis.

This class requires at least one day per week of laboratory research. A final report on the research must be submitted at the end of the academic year.

INSTRUCTOR: D.W. Hoskin

FORMAT: Lab 1 day per week

PREREQUISITES: Permission of the Undergraduate Studies

Committee and a member of the Department who will serve as a supervisor. At least a B average for MICR 3033.03, 3114.03, 3115.03 and 3118.03 (or equivalent)

Music

Location: Dalhousie Arts Centre
6101 University Avenue, Fifth Floor
Halifax, NS B3H 1W8
Telephone: (902) 494-2418
Fax: (902) 494-2801

Dean

Taylor, G.D., BA, PhD (Penn)

Chair

Kemp, W.H. (494-1142)

Student Advisors

Kemp, W.H. (494-1142) - BMus, BA
Perron, P. (494-1926) - MusEd

Professors

Farrell, D.M., BA (St. Norbert Col), MMus, PhD (Wisc), (Theory and Composition)
Kemp, W.H., MusBac, MusM (Tor), AM (Harv), DPhil (Oxon), (Theory, History and Choral)
Schroeder, D.P., AMus, BA, MA (Western) PhD (Cantab), (Theory and History)

Associate Professors

Djokic, P., BMus, MMus (Juilliard), (Violin)
Perron, P.A., BMus (McG), MMusEd (Holy Names College), (Music Education)
Servant, G., BMus (Dal), MMus, DMA (Hartt), (Voice, Opera Workshop)
Stodola, L., BMus (Chic), MMus (Juilliard), (Piano)
Zonneveld, T., Dipl (Teach), Dipl (School Mus), Dipl (Performance), (Royal Conservatory, The Hague), (Piano, Foundational Studies, Keyboard Skills Coordination)

Assistant Professors

Ferenc, A., BMus, MA (McG), PhD (Michigan), (Theory, Form and Analysis)

Part-Time Faculty

Babineau, N. (Music Education, String Studies)
Burchill, J., BA (King's), BMus (Tor), Mus (Indiana), MA, PhD (Eastman), (Organ, Church Music)
Davies, C., BMus (Dal), MMus (Boston), (Aural and Keyboard Skills)
Fralick, E. (Keyboard Skills, Orchestration)
Hill, T., MA (Calif, Davis), (Music Education, Band Studies)
Hoffman, A., BMus, MMus, (New England Conservatory), (Music Appreciation)
Hoffman, L., BA, MA (Radford), DMA (Memphis State), (Keyboard Skills, Theory)
Kemp, V., MusBac (Tor), (Music Education, Orff)
MacKay, R. (Band Director)
Naylor, S., BA (Waterloo Lutheran), BIS (Waterloo), (Electroacoustic Music)
Palmer, D. (Jazz Studies)
Theriault, D., BA (Ottawa), BMus (Carleton), MBA (Dal) (Sound Recording)

Applied Skills Instructors

Guitar and Lute: Reach, D., BMus (Dal)
Flute: Creighton, P., BMus (Tor) and DuBois, E., BMus (Rochester), MMus (Emporia State)
Oboe: Lemieux, S.

Clarinet: Rapson, J.
Bassoon: Rothwell, I.
Recorder: Evans, P.
Saxophone: Palmer, D.
Horn: McCosh, R.
Trumpet: Stern, J., BMus, MMus (New England Conservatory)
Trombone and Tuba: Schoales, H.
Cello: Walt, S.
String Bass: Turofsky, L., BMus (Tor) and Kasper, M.
Percussion: Faraday, J.
Harpichord: TBA

Staff Piano

Accompanists: Bradshaw, D., BMus, MMus (Tor), Murray, H., BAHonMus, LRCT (Tor) ARCCO, and Torbert, D., BMus (Converse), MMus (Manhattan)
Technician: Haines, F.

I. 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, music industry commercial studio and electroacoustic work, arts management, recreational and therapeutic work, to name only a few. A carefully chosen BA (General) or combined Honours BA or BSc programme could furnish a basic equipment for further studies in preparation for such professions. In the BA (Music and Theatre), the essential curricula of the voice and acting programmes are combined to offer training to the potential 'triple threat' stage performer. 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.

A. Classes for Non-Majors

Classes offered as arts electives for non-majors are as follows:

- MUSC 1000.06: Listening to Music
- MUSC 1001.03: Materials of Music
- MUSC 1002.03: Introductory Music Theory
- MUSC 1010.06: Music and Culture
- MUSC 2007.06: Guitar and Lute
- MUSC 2008.06: Modern Guitar
- *MUSC 2011.06: History of Opera
- *MUSC 2012.06: Music and Psychology
- *MUSC 2013.06: The Evolution of Jazz
- *MUSC 2015.06: Music and Cinema
- MUSC 2060.03: Introduction to Music and Sound Technology
- MUSC 2061.03: Electroacoustic Music
- MUSC 2600.06: Recording Studio Techniques
- *MUSC 3064.03: Women in Canadian Music
- MUSC 3319.06: History of Musical Theatre
- *MUSC 4050.03: Music and Science, Ancient World to Boethius
- *MUSC 4051.03: Music and Science, Since Boethius

Other classes in Music may be taken by special permission of the department.

B. Academic Dismissal/Voluntary Withdrawal

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.

II. Degree Programmes

A. Foundational Classes

These classes are for those prospective music majors who, in the opinion of the auditioning faculty, indicate University-level talent and aptitude in performance but who are in need of a more prolonged exposure to pre-major levels of music literature, theory and related skills.

Students admitted to this level enrol in the BA Non-major Music Foundational Classes Programme, and may take a maximum of five full-credit classes.

Curriculum

- MUSC 1001.03: Materials of Music
- MUSC 1002.03: Introduction to College Music Theory
- MUSC 1070.03: Foundational Aural Perception
- MUSC 1071.03: Foundational Keyboard Proficiency
- MUSC 1100.06: Foundational Applied Skills
- Required Writing Class (from another department - see Degree Requirements 1.2 for a list of writing classes)
- Second non-music elective full-credit

Special Notes:

1. Music classes MUSC 1001.03, MUSC 1002.03, MUSC 1070.03, AND MUSC 1071.03 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:

MUSC 1001.03	C
MUSC 1002.03	B
MUSC 1070.03	B
MUSC 1071.03	B
Writing Class	B
Each Elective	BB

B. 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.

1. Common Curriculum

First-Year

- MUSC 1000-level Applied Skills (MUSC 1101.06 to MUSC 1121.06)
- MUSC 1201.03: Theory I
- MUSC 1202.03: Theory II
- MUSC 1270.03: Aural Perception I
- MUSC 1271.03: Keyboard Skills I
- MUSC 1350.03: History of Music I (Med./Ren.)

- MUSC 1351.03: History of Music II (Baroque)
- Arts and Social Sciences or Science Elective, one full credit (Writing Class Elective)

Second-Year

- MUSC 2000-level Applied Skills (MUSC 2101.06 to MUSC 2121.06)
- MUSC 2201.03: Theory III
- MUSC 2202.03: Theory IV
- MUSC 2270.03: Aural Perception II
- MUSC 2271.03: Keyboard Skills II
- MUSC 2350.03: History of Music III (Classic)
- MUSC 2351.03: History of Music IV (Romantic)
- Arts and Social Sciences or Science Elective, one full credit.

2. Concentration in 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.

Third-Year

- MUSC-3000 level Applied Skills (MUSC 3101.06 to MUSC 3121.06)
- MUSC 3199.03: Recital
- MUSC 3280.03: Counterpoint
- MUSC 3281.03: Form and Analysis I
- MUSC 3282.03: Orchestration
- MUSC 3351.03: Music Since 1950
- Music Elective, one half credit
- Arts and Social Sciences or Science Elective, one full credit

Fourth-Year

- MUSC 4000-level Applied Skills (MUSC 4101.06 to MUSC 4121.06)
- MUSC 4199.03: Area Graduation Requirement (Recital)
- MUSC 4281.03: Form and Analysis II
- Music Elective, 2 full credits
- 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: MUSC 4271.03, MUSC 4370.03, MUSC 4198.03, and the half-credit class in church music offered at the Atlantic School of Theology and taken through letter of permission.

3. Concentration in Composition

Third-Year

- MUSC 3000-level Applied Skills (MUSC 3101.06 to MUSC 3121.06)
- MUSC 3210.06: Composition
- MUSC 3280.03: Counterpoint
- MUSC 3281.03: Form and Analysis I
- MUSC 3282.03: Orchestration
- MUSC 3351.03: Music Since 1950
- Arts and Social Sciences or Science Elective, one full credit.

Fourth-Year

- MUSC-4000 level Applied Skills (MUSC 4101.06 to MUSC 4121.06)
- MUSC 4210.06: Composition
- MUSC 4280.03: Advanced Harmony and Counterpoint
- MUSC 4281.03: Form and Analysis II
- MUSC 4299.03: Area Graduation Requirement (Composition)

- Music Elective, one half credit
- Arts and Social Sciences or Science Elective, one full credit.

4. Concentration in History and Literature

Third-Year

- MUSC 3000-level Applied Skills (MUSC 3101.06 to MUSC 3121.06)
- MUSC 3280.03: Counterpoint
- MUSC 3281.03: Form and Analysis I
- MUSC 3282.03: Orchestration
- MUSC 3351.03: Music Since 1950
- MUSC 3362.03: Music in Canada to 1950
- Music elective; one half credit
- Arts and Social Sciences or Science Elective, one full credit.

Fourth-Year

- MUSC 4000-level Applied Skills (MUSC 4101.06 to MUSC 4121.06)
- MUSC 4281.03: Form and Analysis
- MUSC 4368.03 & MUSC 4369.03: Special Studies
- MUSC 4399.03: Area Graduation Requirement (Thesis)
- Music Elective, one credit
- Arts and Social Sciences or Science Elective, one full credit.

5. Unconcentrated Programme

Third-Year

- MUSC 3000-level Applied skills (MUSC 3101.06 to MUSC 3121.06)
- MUSC 3280.03: Counterpoint
- MUSC 3281.03: Form and Analysis I
- MUSC 3282.03: Orchestration
- MUSC 3351.03: Music Since 1950
- Music elective, one full credit
- Arts and Social Science or Science elective, one full credit.

Fourth-Year

- MUSC 4000-level Applied Skills (MUSC 4101.06 to MUSC 4121.06)
- MUSC 4282.03: Form and Analysis
- MUSC 4399.03: Graduation Requirement, Unconcentrated
- Music Elective, two full credits
- Arts and Social Science or Science elective, one full credit.

6. Standards

All students wishing to enter third-year required Music classes other than MUSC 3351.03 in the BMus programme must successfully complete their MUSC 2000-level Applied Skills and MUSC 2202.03, MUSC 2270.03 and MUSC 2271.03 and achieve an overall average of B- in the music classes of the first- and second-years, including a minimum standing of C in MUSC 1201.03, B- in MUSC 1202.03 and each of their MUSC 2000-level Applied Skills, MUSC 1270.03 and MUSC 2270.03, and B in MUSC 2201.03 and MUSC 2202.03.

Students failing to demonstrate the required standards in MUSC 2270.03 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 MUSC 1000- and MUSC 2000-level Applied Skills; in history and literature, an average of B+ in MUSC 1350.03, MUSC 1351.03, MUSC 2350.03 and MUSC 2351.03 and demonstrate acceptable writing ability; in composition, a minimum of B in MUSC 1202.03, 1270.03 and 1271.03, and B+ in MUSC 2201.03, 2202.03, 2270.03, and 2271.03, and also successfully complete a portfolio of original compositions and a satisfactory interview with 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 B- in each of their Arts and Social Sciences or Science electives.

C. Bachelor of Arts Combined Honours in Music and Theatre

The four year Bachelor of Arts Combined Honours in Music and Theatre combines the principal classes of the Bachelor of Music concentration in Voice with the Bachelor of Arts in Theatre classes in Acting and Improvisation, Dance and Movement. To qualify for Graduation a student must participate in a staged musical presentation, either as a separate ensemble recital or as an integral part of Theatre Productions, and also must submit a comprehensive essay on an aspect of Musical Theatre. Students must audition for both the Music and the Theatre Departments; a maximum of five will be selected for entrance into the programme each year. The graduate of this programme will advance toward a professional career in the performing arts equipped with a solid foundation in academic, vocal, and stage skills.

Year One

- MUSC 1101.06: Voice I
- MUSC 1201.03: Music Theory I
- MUSC 1202.03: Music Theory II
- MUSC 1270.03: Aural Perception I
- MUSC 1271.03: Keyboard Skills I
- THEA 1000.06: A Survey of Dramatic Literature [Writing Requirement]
- THEA 1800.06: An Introduction to Acting in Performance
- Ensemble: Chamber Choir

Year Two

- MUSC 2101.06: Voice II
- MUSC 2201.03: Music Theory III
- MUSC 2202.03: Music Theory IV
- MUSC 2270.03: Aural Perception II
- MUSC 2271.03: Keyboard Skills II
- THEA 2830.06: An Introduction to Acting, Improvisation, Movement and Dance
- Arts & Social Science elective: One of 1000-level Life or Physical Science, Social Science, or Language Class Requirement
- Ensemble: Opera Workshop

Year Three

- MUSC 3103.06: Voice III
- MUSC 3319.06/THEA 3010.06: The History of Musical Theatre
- THEA 3800.06: Acting
- THEA 3820.06: Movement and Dance
- Arts & Social Science: One of remaining 1000-level Life or Physical Science, Social Science, or Language Class Requirement
- Ensemble: Opera Workshop

Year Four

- MUSC 4101.06: Voice IV
- THEA 4800.06: Acting
- THEA 4820.06: Movement and Dance
- Arts & Social Science: Remaining 1000-level Life or Physical Science, Social Science, or Language Class Requirement
- Arts & Social Science: Full-credit elective above the 1000 level in Music Theatre, Language or related Subject approved by Departments
- Ensemble: Opera Workshop

A comprehensive essay/production has to be completed as a 21st credit.

D. Bachelor of Music Education (BMusEd)

PLEASE NOTE: The Bachelor of Music Education programme here described will be phased out. The deadline for completion of all requirements by currently registered students is June 30, 1999. Please consult the Department for Music Education classes available to students enrolled in September 1995 and after. Students interested in pursuing a career in classroom teaching should enrol in the new Bachelor of Music Programme (Concentration: Instruction) in order to prepare for subsequent application for Teacher Certification through a College of Education BEd in Music with a second teachable subject.

The four-year BMusEd 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 first- and second-year, 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 BMusEd programmes, Third- and Fourth-years choosing between curricula in Classroom Music or Instrumental Music. Normally these programmes are as follows:

1. Classroom Music

Third-Year

- MUSC 3000-level Applied Skills (MUSC 3101.06 to MUSC 3121.06)
- MUSC 3160.03: Conducting
- MUSC 3161.03: Choral Technique
- MUSC 3351.03: Music Since 1950
- MUSC 3400.06: Elementary Methods
- MUSC 3470.03: Field Experience
- MUSC 3471.03: Solfa
- A half credit elective in Music or Music Education.

Fourth-Year

- EDUC 4450.06: Special Education and Educational Psychology
- MUSC 4000-level Applied Skills
- MUSC 4400.03: Secondary Methods
- MUSC 4470.03: Field Experience
- MUSC 4482.03: Choral Arranging
- One-half Education Foundation credit
- One full credit elective in Music, Music Education, or Arts and Social Sciences or Science

2. Instrumental Music

Third-Year

- MUSC 3000-level Applied Skills
- MUSC 3160.03: Conducting
- MUSC 3351.03: Music Since 1950
- MUSC 3400.06: Elementary Methods
- MUSC 3470.03: Elementary Field Experience
- MUSC 3471.03: Solfa
- Either MUSC 3480.03: Band Instruments or MUSC 3481.03: String Instruments
- Half credit in Music or Music Education.

Fourth-Year

- EDUC 4450.06: Special Education and Educational Psychology
- One-half Education Foundation credit
- MUSC 3282.03: Orchestration
- MUSC 4000-level Applied Skills
- MUSC 4400.03: Secondary Classroom Teaching Methods
- MUSC 4470.03: Secondary Classroom Field Experience
- Either MUSC 4481.03: Band Methods and Field Experience or MUSC 4483.03: String Methods and Field Experience

E. Bachelor of Music Education/Bachelor of Education (BMusEd/BEEd)

PLEASE NOTE: The five year Bachelor of Music Education/Bachelor of Education combined programme here described will be phased out. The deadline for completion of all requirements by currently registered students is June 30, 1999. Please consult the Department for Music Education classes available to students enrolled in September 1995 and after. For programme requirements please consult the calendar of the year in which you started the programme.

Students interested in pursuing a career in classroom teaching should enrol in the new Bachelor of Music Programme (Concentration: Instruction) in order to prepare for subsequent application for Teacher Certification through a College of Education BEEd in Music with a second teachable subject.

The five-year BMusEd/BEEd integrated programmes in elementary and secondary music education combine the curricula of the BMusEd programmes with additional training in either elementary classroom teaching or a second teachable subject appropriate for secondary school. The BMusEd/BEEd 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.

1. Co-requirements

Elementary: A student must complete a minimum of 3 full classes from English, History, Math, and Science. It is recommended that classes 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 BEEd Programmer.

2. Standards

All students wishing to enter third-year required Music classes other than MUSC 3351.03 in either the BMusEd or BMusEd/BEEd programme, must successfully complete their MUSC 2000-level Applied Skill, MUSC 2202.03, MUSC 2270.03 and MUSC 2271.03 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 MUSC 1201.03, MUSC 1202.03, MUSC 2201.03 and MUSC 2202.03, and a minimum of B- in each of their MUSC 2000-level Applied Skills, MUSC 1270.03 and MUSC 2270.03.

Students failing to demonstrate the required standard in MUSC 2270.03 must repeat the class. In order to qualify for the award of a BMusEd or BMusEd/BEEd 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/BEEd programme may give a graduation recital instead of a final jury exam.

F. Bachelor of Arts (Major in Music)

Departmental Requirements

1000 level

- Music 1000-level applied skills
- MUSC 1350.03
- MUSC 1351.03
- MUSC 1201.03
- MUSC 1202.03

- MUSC 1270.03
- MUSC 1271.03

2000 level

- At least 2 credits

3000 level

- At least 2 credits

Classes in subjects other than Music, to a maximum total of 8 full credit classes including the writing class (in compliance with Degree Requirements 1.2), may be selected in consultation with the Department to suit a student's individual needs and interests. Music Education classes and Foundational Music 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.

G. Bachelor of Arts and Bachelor of Science (Combined Honours Programmes)

Students may enrol in a combined honours programme with the joint approval of the Music Department and the department of the allied subject (in compliance with the Combined Honours degree requirements detailed in the Degree Requirements section of this calendar).

III. Classes Offered

NOTE: Classes marked * are not offered every year. Please consult the current timetable to determine current offerings.

MUSC 1000.06: 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: A. Hoffman
 FORMAT: Lecture 3 hours

MUSC 1001.03: 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: 1. auditioned students will be advised to take a year of private studies if their preparedness falls below the introductory level; 2. non-majors taking MUSC 1001.03 as an elective are not required to enrol in the aural/keyboard labs.

INSTRUCTOR: T. Zonneveld
 FORMAT: Lecture 2 hours, lab

MUSC 1002.03: Introductory Music Theory.

A continuation of MUSC 1001.03 for foundational students and non-majors. Rhythm and phrase structures, "musica ficta" 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 MUSC 1201.03; four-part writing as an immediate transition to MUSC 1202.03.

NOTE: non-majors taking MUSC 1002.03 as an elective are not required to enrol in the aural/keyboard labs.

INSTRUCTOR: T. Zonneveld
 FORMAT: Lecture 2 hours, lab
 PREREQUISITE: MUSC 1001.03 or its equivalent

MUSC 1010.06: Music and Culture.

This is an interdisciplinary class, presented as a series of topics, with music discussed in relation to literature, cinema, painting, gender, social change, religion, ecology, as well as issues of perception, semiotics, proportion and audience reception. Various types of music will be discussed, including European and Canadian music, world music, popular music, music of men and women, and music of living composers or musicians. Evaluation is based on assignments and listening exams. This class fulfills the first-year writing class requirement.

INSTRUCTOR: D. Schroeder

FORMAT: Writing Requirement, lecture/discussion 3 hours
 EXCLUSION: Music Majors

MUSC 1070.03: Foundational Aural Perception.

An introduction to the basic concepts and practice of aural perception, through guided progressive training exercises in sight singing and dictation.

INSTRUCTOR: P. Perron

FORMAT: Lab 2 hours

PREREQUISITE: Permission of the Department, on the basis of the results of the Entrance Aural Skills Test

CO-REQUISITE: Music 1001.03, MUSC 1002.03, MUSC 1071.03

EXCLUSION: All students not in the BA non-major Music Foundational Classes Programme

MUSC 1071.03: Foundational Keyboard Proficiency.

An introduction to keyboard proficiency, to prepare the student for successful training in keyboard harmony.

INSTRUCTOR: E. Fralick

FORMAT: Lab 2 hours

PREREQUISITE: Permission of the Department, on the basis of the results of the Entrance Keyboard Proficiency Test

CO-REQUISITE: MUSC 1001.03, 1002.03, 1270.03

EXCLUSION: All students not in the BA non-major Music Foundational Classes Programme

MUSC 1100.06: 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.

MUSC 1000-Level Applied Skills.

- MUSC 1101.06: Voice I
- MUSC 1102.06: Guitar I
- MUSC 1103.06: Piano I
- MUSC 1104.06: Organ I
- MUSC 1105.06: Violin I
- MUSC 1106.06: Viola I
- MUSC 1107.06: Cello I
- MUSC 1108.06: Double Bass I
- MUSC 1109.06: Flute I
- MUSC 1110.06: Oboe I
- MUSC 1111.06: Clarinet I
- MUSC 1112.06: Bassoon I
- MUSC 1113.06: Saxophone I
- MUSC 1114.06: French Horn I
- MUSC 1115.06: Trumpet I
- MUSC 1116.06: Trombone I
- MUSC 1117.06: Tuba I
- MUSC 1118.06: Percussion I
- MUSC 1119.06: Lute I
- MUSC 1120.06: Harpsichord I
- MUSC 1121.06: Recorder I

MUSC 1201.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: D. Farrell

FORMAT: Lecture 3 hours

PREREQUISITES: Permission of the Department, plus Royal Conservatory of Toronto Grade II Theory equivalent or MUSC 1001.03/MUSC 1002.03

CO-REQUISITES: MUSC 1270.03, 1271.03

MUSC 1202.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: D. Farrell

FORMAT: Lecture 3 hours

PREREQUISITE: MUSC 1201.03 or permission of the Department

CO-REQUISITES: MUSC 1270.03, MUSC 1271.03

MUSC 1270.03: Aural Perception I.

A class designed to correlate with MUSC 1201.03 and MUSC 1202.03. 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.

SIGNATURE REQUIRED

INSTRUCTOR: A. Ferenc

FORMAT: Lab 3 hours

PREREQUISITE: Permission of the Department; MUSC 1001.03/1002.03 or equivalent

CO-REQUISITES: MUSC 1201.03, 1202.03, and 1271.03

MUSC 1271.03: Keyboard Skills I.

The development of basic skills in sight reading, score reading and harmonized accompaniment at the keyboard.

SIGNATURE REQUIRED

INSTRUCTORS: C. Davies, E. Fralick

FORMAT: Lab 2 hours

PREREQUISITES: Permission of Department; MUSC 1001.03 /1002.03 or equivalent

CO-REQUISITES: MUSC 1201.03, 1202.03, and 1270.03

MUSC 1350.03: History of Music I.

A study of music in Western Civilization to 1600, including style, cultural contexts, and non-Western influences.

SIGNATURE REQUIRED

INSTRUCTOR: W.H. Kemp

FORMAT: Lecture 3 hours

PREREQUISITE: Permission of the instructor

CO-REQUISITE: Normally, for Music majors, MUSC 1201.03, MUSC 1270.03, MUSC 1271.03

MUSC 1351.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: W.H. Kemp

FORMAT: Lecture 3 hours

PREREQUISITE: MUSC 1350.03

CO-REQUISITES: Normally, for Music majors, MUSC 1202.03, MUSC 1270.03, MUSC 1271.03

***MUSC 2007.06: 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.

SIGNATURE REQUIRED

INSTRUCTOR: D. Reach

FORMAT: Lab 2 hours

PREREQUISITE: Personal interview with instructor

***MUSC 2011.06: 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: W.H. Kemp

FORMAT: Lecture 3 hours

PREREQUISITE: Permission of the Department

***MUSC 2012.06: 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

MUSC 2013.06: 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

MUSC 2015.06: Music and Cinema.

A survey of music used in Cinema in Europe, the United States and Canada from the earliest sound films to the present, covering the four following categories: opera on film, notable film scores, music as film subject, and music used in a special way in films. The types of films used will include feature-length works, documentaries, animations and experimental works.

INSTRUCTOR: D. Schroeder

FORMAT: Lab (Screening)/ lecture 4 hours

EXCLUSION: Music Majors

MUSC 2060.03: Introduction to Music and Sound Technology.

An Introduction to the technologies in common use in music creation, performance and teaching, with particular attention to the way these technologies shape artistic and pedagogical processes.

Topics include basic electroacoustic theory, sound recording and editing, sound synthesis, MIDI, and personal computer music applications.

INSTRUCTOR: S. Naylor

FORMAT: Lecture and lab

PREREQUISITE: Permission of the instructor

MUSC 2061.03: Electroacoustic Music.

An introduction to techniques and strategies for the creation and performance of electroacoustic and experimental music. The emphasis is on individual student creative works, with collective critiques. Students are encouraged to explore historic, contemporary, cross-disciplinary and experimental strategies in the creation and performance of their work.

INSTRUCTOR: S. Naylor

FORMAT: Lab and seminar, 3 hours

PREREQUISITE: MUSC 2660.03 or equivalent; permission of the instructor

MUSC 2000-level Applied Skills

- MUSC 2101.06: Voice II
- MUSC 2102.06: Guitar II
- MUSC 2103.06: Piano II
- MUSC 2104.06: Organ II
- MUSC 2105.06: Violin II
- MUSC 2106.06: Viola II
- MUSC 2107.06: Cello II
- MUSC 2108.06: Double Bass II
- MUSC 2109.06: Flute II
- MUSC 2110.06: Oboe II
- MUSC 2111.06: Clarinet II
- MUSC 2112.06: Bassoon II
- MUSC 2113.06: Saxophone II
- MUSC 2114.06: French Horn II
- MUSC 2115.06: Trumpet II
- MUSC 2116.06: Trombone II
- MUSC 2117.06: Tuba II
- MUSC 2118.06: Percussion II
- MUSC 2119.06: Lute II
- MUSC 2120.06: Harpsichord II
- MUSC 2121.06: Recorder II

MUSC 2130.06: 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.

FORMAT: Lab/demonstration 4 hours

CROSS-LISTING: THEA 2020.06

MUSC 2201.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: L. Hoffman

FORMAT: Lecture 3 hours

PREREQUISITES: MUSC 1202.03, 1270.03, 1271.03

CO-REQUISITES: MUSC 2270.03, 2271.03

MUSC 2202.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: L. Hoffman

FORMAT: Lecture 3 hours

PREREQUISITE: MUSC 2201.03

CO-REQUISITES: MUSC 2270.03, 2271.03

MUSC 2270.03: Aural Perception II.

This class provides further practice in melodic and harmonic dictation and sight-singing; it correlates with MUSC 2201.03 and 2202.03. A special component deals with solmization skills in sight reading.

SIGNATURE REQUIRED

INSTRUCTOR: C. Davies

FORMAT: Lab 2 hours

PREREQUISITES: MUSC 1201.03, 1202.03, 1270.03, 1271.03

CO-REQUISITES: MUSC 2201.03, 2202.03, 2271.03

MUSC 2271.03: Keyboard Skills II.

A continuation of MUSC 1271.03.

SIGNATURE REQUIRED

INSTRUCTOR: C. Davies, L. Hoffman

FORMAT: Lab 2 hours

PREREQUISITES: MUSC 1201.03, 1202.03, 1270.03, 1271.03

CO-REQUISITES: MUSC 2201.03, 2202.03, 2270.03

MUSC 2350.03: History of Music III.

A detailed study of the history, literature and cultural contexts of music from C. 1750 to 1830.

SIGNATURE REQUIRED

INSTRUCTOR: D. Schroeder

FORMAT: Lecture 3 hours

PREREQUISITES: MUSC 1202.03, MUSC 1350.03, MUSC 1351.03

CO-REQUISITE: Normally, for Music majors, MUSC 2201.03

MUSC 2351.03: 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: MUSC 2201.03, MUSC 2350.03

CO-REQUISITE: Normally, for Music majors, MUSC 2202.03

MUSC 2600.06: Recording Studio Techniques.

Techniques for creating and recording music in the contemporary recording studio.

The course will lay a foundation for contemporary musicians and sound artists to understand and work in the recording studio, both as an "instrument" in its own right, and as an extension of their own instrumental techniques.

In addition to technical topics (microphone usage, console and recorder operations, etc.) there is a further emphasis on production techniques: approaches to performing and directing in the studio; proper conduct on both sides of the glass; planning, budgeting and running a session; creative use of technical resources.

INSTRUCTOR: D. Theriault

FORMAT: Lab and lecture, 3 hours

PREREQUISITE: Interview with the instructor

NOTE: An auxiliary fee specific to this course will apply to all students.

MUSC 2660.03: Introduction to Music and Sound Technology.

See class description under MUSC 2060.03.

MUSC 2661.03: Electroacoustic Music.

See class description under MUSC 2061.03.

*MUSC 3064.03: 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 Beecroft, Jean Coulthard and Barbara Pentland; a survey of the younger generation of contemporary Canadian women composers. Approved with Canadian Studies.

INSTRUCTOR: W.H. Kemp

FORMAT: Lecture 2 hours

PREREQUISITE: Permission of the Department

MUSC 3000-level Applied Skills.

- MUSC 3101.06: Voice III
- MUSC 3102.06: Guitar III
- MUSC 3103.06: Piano III
- MUSC 3104.06: Organ III
- MUSC 3105.06: Violin III
- MUSC 3106.06: Viola III
- MUSC 3107.06: Cello III
- MUSC 3108.06: Double Bass III
- MUSC 3109.06: Flute III

- MUSC 3110.06: Oboe III
- MUSC 3111.06: Clarinet III
- MUSC 3112.06: Bassoon III
- MUSC 3113.06: Saxophone III
- MUSC 3114.06: French Horn III
- MUSC 3115.06: Trumpet III
- MUSC 3116.06: Trombone III
- MUSC 3117.06: Tuba III
- MUSC 3118.06: Percussion III
- MUSC 3119.06: Lute III
- MUSC 3120.06: Harpsichord III
- MUSC 3121.06: Recorder III

MUSC 3130.06: 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).

FORMAT: Lab/demonstration 4 hours

PREREQUISITE: Admission is subject to approval of instructor (Audition/Interview)

CROSS-LISTING: THEA 3020.06

MUSC 3160.03: Conducting.

SIGNATURE REQUIRED

INSTRUCTOR: P. Djokic

FORMAT: Lab 2 hours

PREREQUISITES: MUSC 2202.03, 2270.03, and 2271.03

MUSC 3161.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: W.H. Kemp

FORMAT: Lab 2 hours

PREREQUISITES: MUSC 2202.03, 2270.03, 2271.03, and 3160.03

MUSC 3199.03: Recital.

Required of all third-year Bachelor of Music students whose concentration is in Performance.

MUSC 3210.06: Composition I.

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.

SIGNATURE REQUIRED

INSTRUCTOR: 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.

MUSC 3280.03: 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: inventions, canons, and fugal expositions, etc.

SIGNATURE REQUIRED

INSTRUCTOR: D. Farrell

FORMAT: Lecture 2 hours

PREREQUISITE: MUSC 2202.03

MUSC 3281.03: Form and Analysis I.

Analytic study of the form and context of selected late eighteenth and nineteenth century compositions in various styles and idiom.

SIGNATURE REQUIRED

INSTRUCTOR: A. Ferenc

FORMAT: Lecture 2 hours

PREREQUISITES: MUSC 2202.06, 2350.06, 2351.06

MUSC 3282.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: E. Fralick

FORMAT: Lecture 2 hours

PREREQUISITE: MUSC 2202.03

MUSC 3311.06: History of Opera.

See class description under MUSC 2011.06.

MUSC 3312.06: Music and Psychology.

See class description under MUSC 2012.06.

MUSC 3313.06: The Evolution of Jazz.

See class description under MUSC 2013.06.

***MUSC 3319.06: The History of Musical Theatre.**

A survey of musical theatre - history, dramaturgy and production - from its roots in the traditions of European comic opera and the nineteenth century operetta to the works of Lloyd Webber, Sondheim and other present-day writers. A reading knowledge of music is not a prerequisite for this class.

INSTRUCTOR: W.H. Kemp and D. Overton

FORMAT: Lecture 3 hours

PREREQUISITE: Permission of the Department

CROSS-LISTING: THEA 3010.06

MUSC 3351.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: W. Kemp

FORMAT: Lecture 3 hours

PREREQUISITE: Normally, for Music majors, MUSC 2202.03, MUSC 2351.03

***MUSC 3353.03: Chamber Music Literature.**

A study in depth of chamber music from the Eighteenth century to contemporary schools.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PREREQUISITE: MUSC 2202.03, 2351.03

***MUSC 3355.03: The Piano and Its Literature.**

A study in depth of the evolution of the piano and its repertoire from the Eighteenth century to the contemporary.

INSTRUCTOR: L. Stodola

FORMAT: Lecture 3 hours

PREREQUISITES: MUSC 2351.03 and permission of the Department

MUSC 3361.03: History of Dance.

The class will explore the development of dance from the Base 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.

SIGNATURE REQUIRED

INSTRUCTOR: P. Richards

FORMAT: Lecture 2 hours

CROSS-LISTING: LEIS 3157.03

MUSC 3362.03: 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. Approved with Canadian Studies.

INSTRUCTOR: W.H. Kemp

FORMAT: Lecture 2 hours; individual tutorial

PREREQUISITE: Permission of the Department

***MUSC 3363.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: W.H. Kemp

FORMAT: Lecture 2 hours, individual tutorial

PREREQUISITE: Permission of the Department

***MUSC 3364.03: Women in Canadian Music.**

See class description under MUSC 3064.03.

***MUSC 3370.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: D. Schroeder

FORMAT: Seminar 2 hours

PREREQUISITES: MUSC 1350.03, 1351.03, 2350.03, 2351.03

MUSC 3400.06: 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.

SIGNATURE REQUIRED

INSTRUCTOR: P. Perron

FORMAT: Lecture 3 hours

PREREQUISITE: Permission of the Department, and an interview with the designated member of the Music Education faculty

CROSS-LISTING: EDUC 4890.06

MUSC 3470.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: P. Perron

PREREQUISITE: Permission of the Department, and an interview with the designated member of the Music Education faculty

MUSC 3471.03: 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 movable do system, hand-sign singing, singing on absolute letter names, and the use of rhythm names and stick notation.

SIGNATURE REQUIRED

INSTRUCTOR: P. Perron

FORMAT: Lab 2 hours

PREREQUISITE: MUSC 2270.03, permission of the Department, and an interview with the designated member of the Music Education faculty

CO-REQUISITE: MUSC 3400.06 and/or MUSC 4400.03

MUSC 3480.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: J. Stern, Staff Coordinator

FORMAT: Lab 2 hours

PREREQUISITE: Permission of the Department, and an interview with the designated member of the Music Education faculty

MUSC 3481.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: N. Babineau, Staff Coordinator

FORMAT: Lab 2 hours

PREREQUISITE: Permission of the Department, and an interview with the designated member of the Music Education faculty

MUSC 4050.03: Music and Science - The Technical Heritage from the Ancient World up to the Time of Boethius.

The "low-tech" basis of musical composition: origins and geographical transmission of musical scales, intervals, tuning, basic acoustics; comparison of "musical" ratios; ideas inclusive of (pre-Pythagorean) Western and Non-Western musical cultures are discussed, including cosmology, heavenly harmony, religion, and related arts. The nature of hearing and perception are introduced from reputable scientific summaries. Assignments consist of short papers, practice in formal presentational skills, plus small compositional excursions into creative working with actual musical and scientific materials. Also of interest to future teachers of interdisciplinary classes.

SIGNATURE REQUIRED

INSTRUCTOR: D.M. Farrell

FORMAT: Seminar 2 hours

PREREQUISITE: Some formal (i.e., non-self-taught) private or high-school background in the study of Music, with demonstrable fluency in reading music notation. Permission of instructor.

MUSC 4051.03: Music and Science - The Technical Heritage since the Time of Boethius.

The "low-tech" shift in thinking from the conception of a "heavenly" toward more present-day notions of harmony. Tuning crises resulting from part song composition, along with their attendant notational systems, emergent compositional forms and musical instruments; musical allusions in poetry and literature, perspective drawing, physiology. Assignments consist of short papers, practice in formal presentational skills, plus small compositional excursions into creative working with actual musical and scientific materials. Also of interest to future teachers of interdisciplinary classes.

SIGNATURE REQUIRED

INSTRUCTOR: D.M. Farrell

FORMAT: Seminar 2 hours

PREREQUISITE: Some formal (i.e., non-self-taught) private or high-school background in the study of Music, with demonstrable fluency in reading music notation. Permission of instructor

MUSC 4000-level Applied Skills.

- MUSC 4101.06: Voice IV
- MUSC 4102.06: Guitar IV
- MUSC 4103.06: Piano IV
- MUSC 4104.06: Organ IV
- MUSC 4105.06: Violin IV
- MUSC 4106.06: Viola IV
- MUSC 4107.06: Cello IV
- MUSC 4108.06: Double Bass IV
- MUSC 4109.06: Flute IV
- MUSC 4110.06: Oboe IV

- MUSC 4111.06: Clarinet IV
- MUSC 4112.06: Bassoon IV
- MUSC 4113.06: Saxophone IV
- MUSC 4114.06: French Horn IV
- MUSC 4115.06: Trumpet IV
- MUSC 4116.06: Trombone IV
- MUSC 4117.06: Tuba IV
- MUSC 4118.06: Percussion IV
- MUSC 4119.06: Lute IV
- MUSC 4120.06: Harpsichord IV
- MUSC 4121.06: Recorder IV

MUSC 4150.06: 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.

MUSC 4190.06: Symphony Apprenticeship.

A fourth-year student in the Bachelor of Music Performance Concentration who has demonstrated exceptional aptitude and ability in his/her orchestral instrument, appropriate to the standards for employment by Symphony Nova Scotia, will serve apprenticeship in the Symphony, supervised by his/her Department instructor. Normally the majority or all of the 34-38 services will be played during the First Term. Qualification for this credit will be subject to the needs of the Symphony, nomination by the Department, and a successful audition for the Symphony Artistic Director and relevant Symphony Section Principals. The student will be hired by the Symphony at the current per-service rate, and must be a Member in Good Standing of the Atlantic Federation of Musicians. The student will be graded by his/her supervising Instructor on personal observation and on receipt of a signed evaluation from the Artistic Director of the Symphony. Normally there shall be only one such apprenticeship per season, and it is not renewable.

INSTRUCTOR: Staff

FORMAT: Placement in Symphony Nova Scotia, 34-38 Services

PREREQUISITE: Nomination by Department; audition with Symphony Artistic Director and relevant Symphony Section Principals

RESTRICTION: Limited to a student in the fourth year of the BMus Programme Performance Concentration

MUSC 4198.03: Church Music Internship.

This class is restricted to 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: Staff

PREREQUISITE: Permission of the Department

RESTRICTION: Restricted to 4th year BMus Organ and Church Music students.

MUSC 4199.03: Area Graduation Requirement (Recital).

MUSC 4210.06: Composition II.

See class description under MUSC 3210.06.

***MUSC 4271.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: Staff

FORMAT: Lab 2 hours

PREREQUISITE: Departmental consent and an interview with the instructor

MUSC 4280.03: Advanced Harmony and Counterpoint.

The application of acquired harmonic and contrapuntal technique to various instrumental and vocal textures and forms; chorale prelude and fugue.

SIGNATURE REQUIRED

INSTRUCTOR: L. Hoffman

FORMAT: Lecture 2 hours

PREREQUISITES: MUSC 2202.03, 3280.03 and 3281.03

MUSC 4281.03: Form and Analysis II.

Analytic study of the form and content of selected twentieth century compositions in various styles and idioms.

SIGNATURE REQUIRED

INSTRUCTOR: A. Ferenc

FORMAT: Lecture 2 hours

PREREQUISITES: MUSC 2202.03, 2350.03, 2351.03, 3280.03 and 3281.03

MUSC 4282.03: Choral Arranging.

See MUSC 4482.03, in Music Education later in this section.

INSTRUCTOR: D. Farrell

FORMAT: Lecture 2 hours

MUSC 4299.03: Area Graduation Requirement (Composition).

MUSC 4350.03: Music and Science.

(NOTE: Music Majors may count this only as one of their Music electives.) See class description for MUSC 4050.03, in the Music Classes Designed for Non-Majors section, earlier in this departmental section.

SIGNATURE REQUIRED

INSTRUCTOR: D.M. Farrell

FORMAT: Seminar 2 hours

PREREQUISITE: Permission of Instructor and normally MUSC 2201.03, 2202.03, 2270.03, concurrently 3280.03. High-school Science; Math 440/441.

MUSC 4351.03: Music and Science.

(NOTE: Music Majors may count this only as one of their Music electives.) See class description for MUSC 4051.03B, in the Music Classes Designed for Non-Majors section, earlier in this departmental section.

SIGNATURE REQUIRED

INSTRUCTOR: D.M. Farrell

FORMAT: Seminar 2 hours

PREREQUISITE: Permission of INSTRUCTOR and normally MUSC 2201.03, 2202.03, 2270.03, 2271.03, 4350.03 concurrently 3280.03. High-school Science; Math 440/441

MUSC 4352.03: The Russian Avant-Garde in Music, Literature and Art.

This advanced seminar explores the links and parallels between the structure and thematic innovations forged by composers, writers, and artists of the Russian avant-garde. Figures examined include Musorgsky, Rimsky-Korsakow, Stravinsky, Scriabin, Loure, Roslavets and Mosolov in music; Nekrasov, Leskov, Sologub, Akhmatova, Mandel'shtam, Khlebnikov, Bely and Maiakovsky in literature; and the "Wanderers," Bilibin Vrube!, the "World of Art" painters, Larionov, Goncharova, Malevich, Tatlin and El Lissitzky in the visual arts.

INSTRUCTORS: A. Ferenc, J. Barnstead

FORMAT: Seminar

EXCLUSION: RUSS 2061.03

CROSS-LISTING: RUSS 4352.03

MUSC 4364.03: Topics in Music.

These are intensive studies of selected topics announced annually.

SIGNATURE REQUIRED

INSTRUCTOR: Staff

FORMAT: Seminar 2-3 hours

PREREQUISITES: MUSC 1350.03, 1351.03, 2350.03, 2351.03

MUSC 4365.03: Topics in Music History.

These are intensive studies of selected topics announced annually.

SIGNATURE REQUIRED

INSTRUCTOR: Staff

FORMAT: Seminar 2-3 hours

PREREQUISITES: MUSC 1350.03, 1351.03, 2350.03, 2351.03

MUSC 4366.03: Topics in Music.

See class description under MUSC 4364.03.

MUSC 4367.03: Topics in Music History.

See class description under MUSC 4365.03.

MUSC 4368.03: Special Studies.

Individually directed research and writing under the supervision of an appropriate member of the Department.

SIGNATURE REQUIRED

INSTRUCTOR: Staff

PREREQUISITES: MUSC 2350.03, 2351.03, and 3351.03

MUSC 4369.03: Special Studies.

See class description under MUSC 4368.03.

***MUSC 4370.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PREREQUISITE: Permission of the Department

MUSC 4399.03: Area Graduation Requirement (Thesis).**MUSC 4400.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: P. Perron

FORMAT: Lecture 1½ hours

PREREQUISITE: Permission of the Department, and an interview with the designated member of the Music Education faculty

MUSC 4470.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: P. Perron

PREREQUISITE: Permission of the Department, and an interview with the designated member of the Music Education faculty

MUSC 4471.03: 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.

PREREQUISITE: Permission of the Department, and an interview with the designated member of the Music Education faculty

MUSC 4481.03: 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.

SIGNATURE REQUIRED

INSTRUCTOR: T. Hill

FORMAT: Lab 2 hours

PREREQUISITE: MUSC 3460.03, permission of the Department, and an interview with the designated member of the Music Education faculty

MUSC 4482.03: Choral Arranging.

Arranging for school choral ensembles.

INSTRUCTOR: D. Farrell

FORMAT: Lecture 2 hours

PREREQUISITE: MUSC 3282.03, permission of the Department, and an interview with the designated member of the Music Education faculty.

***MUSC 4490.03: 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 specialists; 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.

SIGNATURE REQUIRED

INSTRUCTOR: V. Kemp

FORMAT: Lecture and practicum

PREREQUISITE: Permission of the Department, permission of the Department, and an interview with the designated member of the Music Education faculty

***MUSC 4491.03: Orff Method and Practice Level Two, Intermediate.**

A continuation of MUSC 4490.03 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, cross-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.

SIGNATURE REQUIRED

INSTRUCTOR: Staff

FORMAT: Lecture/practicum

PREREQUISITE: MUSC 4490.03 or a similar class in Basic Orff; an interview with the Department.

MUSC 4599.03: Graduation Requirement, Unconcentrated.

Students in the Unconcentrated BMus programme must receive Departmental approval to fulfill 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

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 is sponsored by the Department of Music:

Dalhousie Chorale (W.H. Kemp):

- MUSC 0051.00: Chorale Foundation
- MUSC 0151.00: Chorale I
- MUSC 0251.00: Chorale II
- MUSC 0351.00: Chorale III
- MUSC 0451.00: Chorale IV
- MUSC 0551.00: Chorale V

Dalhousie Chamber Choir (W.H. Kemp):

- MUSC 0052.00: Chamber Choir Foundation
- MUSC 0152.00: Chamber Choir I
- MUSC 0252.00: Chamber Choir II
- MUSC 0352.00: Chamber Choir III
- MUSC 0452.00: Chamber Choir IV
- MUSC 0552.00: Chamber Choir V

Dalhousie Symphonic Wind Ensemble (R. MacKay):

- MUSC 0053.00: Symphonic Wind Ensemble Foundation
- MUSC 0153.00: Symphonic Wind Ensemble I
- MUSC 0253.00: Symphonic Wind Ensemble II
- MUSC 0353.00: Symphonic Wind Ensemble III
- MUSC 0453.00: Symphonic Wind Ensemble IV
- MUSC 0553.00: Symphonic Wind Ensemble V

Dalhousie Chamber Orchestra (P. Djokic):

- MUSC 0054.00: Chamber Orchestra Foundation
- MUSC 0154.00: Chamber Orchestra I
- MUSC 0254.00: Chamber Orchestra II
- MUSC 0354.00: Chamber Orchestra III
- MUSC 0454.00: Chamber Orchestra IV
- MUSC 0554.00: Chamber Orchestra V

Dalhousie Jazz Ensemble (D. Palmer):

- MUSC 0055.00: Jazz Ensemble Foundation
- MUSC 0155.00: Jazz Ensemble I
- MUSC 0255.00: Jazz Ensemble II
- MUSC 0355.00: Jazz Ensemble III
- MUSC 0455.00: Jazz Ensemble IV
- MUSC 0555.00: Jazz Ensemble V

Dalhousie Brass Ensemble (R. MacKay):

- MUSC 0056.00: Brass Ensemble Foundation
- MUSC 0156.00: Brass Ensemble I
- MUSC 0256.00: Brass Ensemble II
- MUSC 0356.00: Brass Ensemble III
- MUSC 0456.00: Brass Ensemble IV
- MUSC 0556.00: Brass Ensemble V

Dalhousie Musica Antiqua (Staff):

- MUSC 0057.00: Musica Antiqua Foundation
- MUSC 0157.00: Musica Antiqua I
- MUSC 0257.00: Musica Antiqua II
- MUSC 0357.00: Musica Antiqua III
- MUSC 0457.00: Musica Antiqua IV
- MUSC 0557.00: Musica Antiqua V

Dalhousie Percussion Ensemble (J. Faraday):

- MUSC 0058.00: Percussion Ensemble Foundation
- MUSC 0158.00: Percussion Ensemble I
- MUSC 0258.00: Percussion Ensemble II
- MUSC 0358.00: Percussion Ensemble III
- MUSC 0458.00: Percussion Ensemble IV
- MUSC 0558.00: Percussion Ensemble V

Dalhousie Opera Workshop (G. Servant):

- MUSC 0059.00: Opera Workshop Foundation
- MUSC 0159.00: Opera Workshop I
- MUSC 0259.00: Opera Workshop II
- MUSC 0359.00: Opera Workshop III
- MUSC 0459.00: Opera Workshop IV
- MUSC 0559.00: Opera Workshop V

Guitar Ensemble (D. Reach):

- MUSC 0060.00: Guitar Ensemble Foundation
- MUSC 0160.00: Guitar Ensemble I
- MUSC 0260.00: Guitar Ensemble II
- MUSC 0360.00: Guitar Ensemble III
- MUSC 0460.00: Guitar Ensemble IV
- MUSC 0560.00: Guitar Ensemble V

Small Ensembles (staff coaches):

- MUSC 0061.00: Small Ensembles Foundation
- MUSC 0161.00: Small Ensembles I
- MUSC 0261.00: Small Ensembles II
- MUSC 0361.00: Small Ensembles III
- MUSC 0461.00: Small Ensembles IV
- MUSC 0561.00: Small Ensembles V

Accompanying (staff coaches):

- MUSC 0062.00: Accompanying Foundation
- MUSC 0162.00: Accompanying I
- MUSC 0262.00: Accompanying II
- MUSC 0362.00: Accompanying III
- MUSC 0462.00: Accompanying IV
- MUSC 0562.00: Accompanying V

Dalhousie Orchestra (by invitation):

- MUSC 0063.00: Orchestra Foundation
- MUSC 0163.00: Orchestra I
- MUSC 0263.00: Orchestra II
- MUSC 0363.00: Orchestra III
- MUSC 0463.00: Orchestra IV
- MUSC 0563.00: Orchestra V

Nova Scotia Youth Orchestra (by invitation, and Department permission):

- MUSC 0064.00: Nova Scotia Youth Orchestra Found.
- MUSC 0164.00: Nova Scotia Youth Orchestra I
- MUSC 0264.00: Nova Scotia Youth Orchestra II
- MUSC 0364.00: Nova Scotia Youth Orchestra III
- MUSC 0464.00: Nova Scotia Youth Orchestra IV
- MUSC 0564.00: Nova Scotia Youth Orchestra V

New Music Ensemble (staff):

- MUSC 0066.00: New Music Ensemble Found.
- MUSC 0166.00: New Music Ensemble I
- MUSC 0266.00: New Music Ensemble II
- MUSC 0366.00: New Music Ensemble III
- MUSC 0466.00: New Music Ensemble IV
- MUSC 0566.00: New Music Ensemble V

Neuroscience

Location: Psychology Department
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Telephone: (902) 494-3417
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Interim Dean

Ryall, P.J.C., BSc (Dal), MSc (Alta), PhD (Dal), Associate Professor
(Earth Sciences)
Telephone: (902) 494-3540

Programme Advisors

Adamo, S. (494-8853)
Rusak, B. (494-2159)

I. 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.

II. Degree Programmes

A. BSc with Honours in Neuroscience

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 B. Rusak or S. Adamo 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 in the honours programme in Neuroscience will be required of all such students, except PSYO 2000.03. Thus, the minimum programme after year I is NESC 2470.03, NESC 2570.03, BIOL 2020.03; one credit in NESC labs, one credit in NESC options, 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) NESC 4500.06 (honours thesis).

Grade Requirements

All students wishing to take Psychology/Neuroscience classes numbered 2000 or above for which Introductory Psychology or Introductory Biology is a prerequisite must have a grade of B- in an Introductory Psychology class (PSYO 1000.06, 1010.06 or 1500.06) or Introductory Biology class (BIOL 1000.06) if the introductory class was taken in 1992-93 or later.

Departmental Requirements

1000 level

Students should consult with a departmental advisor before making their first year class selections. Required classes include:

- MATH 1000.03
- One other half credit in Mathematics (ideally, but not necessarily, MATH 1010.03)
- Three of the following classes: BIOL 1000.06; CHEM 1010.06 or 1040.06 or 1500.06; PHYS 1100.06 or 1300.06; and PSYO 1000.06 or 1010.06 or 1500.06
- Students are strongly recommended to take the fourth of the above classes as an elective in their second year

2000 level

- NESC 2470.03
- NESC 2570.03
- PSYO 2000.03
- BIOL 2020.03
- One half credit selected from each of: (a) NESC 2130.03, 2140.03, 2150.03; and (b) NESC 2160.03, 2170.03, 2190.03, 2270.03

3000 level

- Lab: One half credit selected from each of: (a) NESC 3370.03, 3371.03, 3775.03, and (b) NESC 3440.03, 4375.03
- PSYO 3500.06
- One credit (or two half credits) selected from NESC 3051.03, 3052.03, 3130.06, 3137.03, 3160.06, 3260.03, 3270.03, 3770.03, 3790.03, 3970.03, 4374.03

4000 level

- NESC 4500.06
- Two half classes selected from NESC 4000.03, 4050.03, 4070.03, 4130.03, 4160.03, 4374.03 or 4375.03
- Two half classes at 3000 or 4000 level from the lists above
- Honours Qualifying Exam

Recommended

It is recommended that students take Psychology 3500.06 (Statistical Methods) in either their third or fourth year of study.

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.
2. BIOL 2020.03: Cell Biology and BIOL 3440.03: Neuroanatomy (same as NESC 3440.03) cannot be counted as credits toward completing a minor in Biology.
3. Students are encouraged to consider the following classes as electives. Classes marked with an asterisk are recommended electives in the first or second year of study: BIOC 4301.03: Biochemical Communication; BIOL 3012.03 or BIOC 3200.03: Biological Chemistry; BIOL 3013.03/BIOC 3300.03: Intermediary Metabolism; BIOL 3014.03/BIOC 3400.03:

Nucleic Acid Biochemistry and Molecular Biology; *CHEM 2400.06: Introductory Organic Chemistry; PHIL 3460.03: Mind and Brain; *PHYC 1100.06/1300.06: Introductory Physics.

B. BSc Advanced Major in Neuroscience

This programme is intended to provide a four-year survey of neuroscience, and is designed for students not anticipating expressly experimental graduate-level training in neuroscience or related disciplines. The Advanced Major programme thus differs from the Honours one in not having thesis (and related) requirements, and in having only two credits of required classes in each of the second, third and fourth years.

Grade Requirements

All students wishing to take Psychology/Neuroscience classes numbered 2000 or above for which Introductory Psychology or Introductory Biology is a prerequisite must have a grade of B- in an Introductory Psychology class (PSYO 1000.06, 1010.06 or 1500.06) or Introductory Biology class (BIOL 1000.06) if the introductory class was taken in 1992-93 or later.

Departmental Requirements

1000 level

Students should consult with a departmental advisor before making their first year class selections. Required classes include:

- MATH 1000.03
- One other half credit in Mathematics (ideally, but not necessarily, MATH 1010.03)
- Three of the following classes: BIOL 1000.06; CHEM 1010.06 or 1040.06 or 1500.06; PHYC 1100.06 or 1300.06; and PSYO 1000.06 or 1010.06 or 1500.06
- Students are strongly recommended to take the fourth of the above classes as an elective in their second year

2000 level

- NESC 2470.03
- NESC 2570.03
- BIOL 2020.03
- PSYO 2000.03

3000 /4000 level

- One half credit selected from each of: (a) NESC 3370.03, 3371.03, 3775.03; and (b) NESC 3440.03, 4375.03
- One credit, or two half credits, selected from NESC 3051.03, 3052.03, 3130.06, 3137.03, 3160.06, 3260.03, 3270.03, 3770.03, 3790.03, 3970.03, 4374.03
- Two additional credits of 3000- or 4000-level NESC classes.

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.
2. BIOL 2020.03: Cell Biology and BIOL 3440.03: Neuroanatomy (same as NESC 3440.03) cannot be counted as credits toward completing a concurrent major in Biology if they are already counted as credits toward a major in Neuroscience.

III. Classes Offered

NESC 2130.03: 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.

INSTRUCTOR: B. Earhard

FORMAT: Lecture 3 hours

PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE

1500.30 (with a grade of B- or better)

CROSS-LISTING: PSYO 2130.03

NESC 2140.03: 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 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.

INSTRUCTOR: V. LoLordo

FORMAT: Lecture 3 hours

PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE

1500.30 (with a grade of B- or better)

CROSS-LISTING: PSYO 2140.03

NESC 2150.03: 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.

INSTRUCTORS: D.E. Mitchell

FORMAT: Lecture 3 hours

PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE

1500.30 (with a grade of B- or better) or BIOL 1000.06

CROSS-LISTING: PSYO 2150.03

NESC 2160.03: 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.

INSTRUCTOR: B.R. Moore

FORMAT: Lecture 3 hours

PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE

1500.30 (with a grade of B- or better) or BIOL 1000.06

CROSS-LISTING: PSYO 2160.03

NESC 2170.03: 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.

INSTRUCTOR: R.E. Brown

FORMAT: Lecture 3 hours

PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE

1500.30 (with a grade of B- or better) or BIOL 1000.06

CROSS-LISTING: PSYO 2170.03

NESC 2190.03: Psycholinguistics.

An introduction to the processes in the use of language by human beings. The main topics are: 1) the nature of language, 2) syntactic organizations, 3) propositions, 4) thematic structures, 5) speech comprehension, 6) speech production, 7) speech acts, 8) discourses, and 9) language development.

INSTRUCTOR: M. Yoon

FORMAT: Lecture 3 hours

PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE 1500.30 (with a grade of B- or better)

CROSS-LISTING: PSYO 2190.03

NESC 2270.03: Introduction to 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, and localization of brain function are examples of topics covered.

INSTRUCTOR: M. Ozler

FORMAT: Lecture 3 hours

PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE

1500.30 (with a grade of B- or better)

CROSS-LISTING: PSYO 2270.03

NESC 2470.03: Introduction to Neuroscience I. Brain Systems.

This lecture class is intended to provide an introduction to the gross structures and functions of the brain. The class treats the brain as a set of neural systems, each with relatively well-defined anatomical substrates and functional roles. The class examines each neural system one at a time, exploring its anatomical architecture, connections and function. These systems may include the peripheral nerves, the mechanisms of sensation and motor control, the cranial nerves, the brainstem, cerebral cortex and cerebellum. For each of the neural systems, the class examines some of the clinical consequences of injury or pathology. Introduction is also provided to recent advances in brain imaging and brain chemistry. This class does not cover cellular or molecular mechanisms of brain function in any detail; students wishing explicit instruction in those fields should see the Calendar entries for "Introduction to Neuroscience II. Cellular Neurobiology" and/or "Molecular Neuroscience", respectively.

INSTRUCTOR: R. Brown, D. Mitchell, D. Phillips

FORMAT: Lecture 3 hours

PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE

1500.30 (with a grade of B- or better) or BIOL 1000.06

EXCLUSION: NESC/PSYO 2071.03

CROSS-LISTING: PSYO 2470.03

NESC 2570.03: Introduction to Neuroscience II - Cellular Neurobiology.

Building on the knowledge of holistic aspects of brain function gained in NESC 2470.03, 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.

INSTRUCTORS: S.R. Shaw

FORMAT: Lecture 3 hours

PREREQUISITE: NESC/PSYO 2470.03 or instructor's consent

EXCLUSION: NESC/PSYO 2072.03

CROSS-LISTING: PSYO 2570.03

NESC 3000.06: Independent Research in Neuroscience.

Primarily for honours students wishing further experience an understanding of neuroscience research. Students not in the honours programme normally will be expected to have a grade of B or better in Psychology 2000.03, a high level of performance in other Neuroscience classes, and an overall B+ (GPA 3.30) average. A student in the class chooses a faculty member who serves as an advisor throughout the academic year, and under whose supervision independent research is conducted. Before registering for this class, a student must provide the instructor of the class with a letter from the faculty member who has agreed to supervise the course of study. Class approval will not be given until this is done.

SIGNATURE REQUIRED

INSTRUCTOR: D. Mitchell

FORMAT: Lab 4 hours

PREREQUISITES: PSYO 2000.03 or NESC/PSYO 2470.03 and previous or

concurrent enrolment in two other 3000-level classes; and the prior

consent of the instructor

CROSS-LISTING: PSYO 3000.06

NESC 3051.03: Sensory Neuroscience I - Vision.

Because our visual perceptions are rich, varied and with few exceptions, arise quickly, flawlessly and without apparent cognitive effort, it might be thought that the underlying processes are simple. That this is not the case is illustrated by the difficulty with which the performance of our biological visual system can be matched by artificial systems. Beginning with a description of the information available in the retinal image, this class will examine the neural basis for the perception of light, colour, movement, depth and form in a variety of species chosen to illustrate common as well as specialized mechanisms of neural processing. In addition, the class will describe the development of perception and discuss the extent to which performance at any age is constrained by the anatomical and physiological development at various levels within the visual pathway.

INSTRUCTOR: D. Mitchell

FORMAT: Lecture 3 hours/research lab 2 hours

PREREQUISITES: PSYO 2000.03, and NESC/PSYO 2150.03 or 2470.03

EXCLUSION: NESC/PSYO 3050.06

CROSS-LISTING: PSYO 3051.03

NESC 3052.03: Sensory Neuroscience II - Hearing and Speech.

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.

INSTRUCTOR: D.P. Phillips

FORMAT: Lecture 3 hours

PREREQUISITES: PSYO 2000.03 and NESC/PSYO 2150.03 or

3051.03; NESC/PSYO 2470.03 is strongly recommended

EXCLUSION: PSYO/NESC 3150.03

CROSS-LISTING: PSYO 3052.03

NESC 3130.06: 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.

INSTRUCTOR: P. McMullen

FORMAT: Lecture 2 hours, research lab 2 hours

PREREQUISITES: PSYO 2000.03 and either NESC/PSYO 2130.03,

2150.03, 2270.03 or instructor's consent

CROSS-LISTING: PSYO 3130.06

NESC 3137.03: Research Methods in Cognitive Neuroscience.

The focus of this class will be on the methodological approaches as well as the techniques used to study human cognition from a neural perspective. Readings will be used in which cognitive functions such as memory, language, perception and attention are examined using brain imaging methods; methods discussed will include positron emission tomography (PET), functional magnetic

resonance imaging (fMRI), magnetoencephalography (MEG), electroencephalography/event-related potential measures (EEG/ERP) and eye movement recordings. Students will learn about these methods, their strengths and weaknesses, as well as how they can be used together in a complementary fashion. Students will conduct several research projects in the laboratory and will learn the basics of human electrophysiological recording and analysis methods. Students will serve as experimenters and subjects for class experiments and will be responsible for producing written laboratory reports for each experiment.

INSTRUCTOR: J. Connolly

FORMAT: Lecture 2 hours, research lab 2 hours

PREREQUISITES: PSYO 2000.03 and NESC/PSYO 2130.03

RECOMMENDED: NESC/PSYO 2470.03

CROSS-LISTING: PSYO 3137.03

NESC 3160.06: 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).

INSTRUCTOR: J. Fentress

FORMAT: Lecture 2 hours, lab 2 hours

PREREQUISITES: PSYO 2000.03 and NESC/PSYO 2160.03, or BIOL 1000.06 and instructor's consent

CROSS-LISTING: PSYO 3160.06

NESC 3227.03: Principles of Human Neuropsychology.

In this class we study current knowledge about the ways in which behaviour changes when the human brain is damaged. We also learn how that knowledge is used in the diagnosis, assessment and rehabilitation of individual cases. The research methods we consider include brain-imaging technologies and neuropsychological test batteries. Here are two samples of the many questions we may ask: How does the brain produce awareness of the external environment and the internal state of the body, and how does awareness change as a result of faulty brain function? What do we know about the changed brains and the adjusted behaviours of people who suffer from stroke or dementia or traumatic head injuries?

INSTRUCTOR: M. Ozler

FORMAT: Lecture 3 hours

PREREQUISITES: PSYO 2000.03, and NESC/PSYO 2270.03 or 2470.03, or permission of the instructor.

CROSS-LISTING: PSYO 3227.03

NESC 3237.03: 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.

INSTRUCTOR: R.E. Brown

FORMAT: Lecture 3 hours

PREREQUISITES: PSYO 2000.03 and one 2000-level class from Psychology Group A

EXCLUSION: NESC/PSYO 2370.03

CROSS-LISTING: PSYO 3237.03

NESC 3260.03: 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.

INSTRUCTOR: B. Rusak

FORMAT: Lecture 3 hours

PREREQUISITE: PSYO 2000.03, or BIOL 1000.06 and permission of instructor

CROSS-LISTING: PSYO 3260.03

NESC 3270.03: 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.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PREREQUISITES: PSYO 2000.03, NESC/PSYO 2470.03 and 2570.03

CROSS-LISTING: PSYO 3270.03

NESC 3370.03: Neuroscience Laboratory I.

The two classes NESC/PSYO 3370.03 and 3371.03 (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 3370.03, while detailed neuroanatomically-based approaches are favoured in 3371.03. 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.

SIGNATURE REQUIRED

INSTRUCTOR: S.R. Shaw

FORMAT: Lab 3 hours

PREREQUISITES: PSYO 2000.03, NESC/PSYO 2470.03 and 2570.03, or 3270.03, and instructor's consent

CROSS-LISTING: PSYO 3370.03

NESC 3371.03: Neuroscience Laboratory II.

For a description of this type of neuroscience lab class, see the entry under 3370.03 above; usually, 3371.03 is coordinated closely with 3370.03. Lab II usually, but not always, runs in the second term and develops different research approaches.

SIGNATURE REQUIRED

INSTRUCTOR: I.A. Meinerzhagen

FORMAT: Lab 3 hours

PREREQUISITES: PSYO 2000.03, NESC/PSYO 2470.03 and 2570.03, or 3270.03, and instructor's consent

CROSS-LISTING: PSYO 3371.03

NESC 3440.03: 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.

INSTRUCTOR: H.H. Ellenberger and F.M. Smith (Anatomy and Neurobiology Dept.)

FORMAT: Lecture/lab 3 hours
PREREQUISITE: BIOL 2020.03 or permission of the instructor
CROSS-LISTING: ANAT 2100.03, BIOL 3440.03

NESC 3770.03 Behavioural Neuroscience.

Behavioural neuroscience concerns itself with the neural mechanisms underlying a variety of behavioural phenomena. Its subject matter includes the neural mechanisms controlling a variety of regulatory and motivational systems, including: feeding, drinking, reward, sexual and parental behaviour, temperature regulation, sleep and waking, motor and sensory system function, learning and other forms of behavioural plasticity, memory, and the physiological mechanisms underlying behavioural disorders. Students should be familiar with experimental research methods, and have some background in biological or neural aspects of psychology.

INSTRUCTOR: Staff
FORMAT: Lecture 3 hours
PREREQUISITES: PSYO 2000.03 and NESC/PSYO 2470.03
EXCLUSION: NESC/PSYO 3070.06 or 3071.06
CROSS-LISTING: PSYO 3770.03

NESC 3775.03: Behavioural Neuroscience Laboratory.

The purpose of this laboratory class is to expose students who are motivated to pursue a career in neuroscience, or in a related biomedical discipline, direct experience of research involving studies of the nervous system in relation to behaviour. Students will be expected to acquire skills in animal handling, animal care, recovery surgery, behavioural observations, and histological analysis of the brain. Acquisition of these methods during the class should facilitate students' research efforts in their Honours theses.

SIGNATURE REQUIRED
INSTRUCTOR: Staff
FORMAT: Lab 3+ hours
PREREQUISITES: NESC/PSYO 3770.03 and instructor's consent
EXCLUSION: NESC/PSYO 3070.06
CROSS-LISTING: PSYO 3775.03

NESC 3790.03: Neurolinguistics.

This class is designed to build upon the outline of linguistics provided in NESC/PSYO 2190.03. The course will cover: 1) brain damage and language disorders, 2) aphasia, 3) localization of lesions in the human brain, 4) neuroimaging, 5) intracranial electric stimulation experiments, 6) event related brain potential experiments, 7) PET, fNMR scan experiments, and 8) neural models of language processing.

INSTRUCTOR: M. Yoon
FORMAT: Lecture 3 hours
PREREQUISITE: NESC /PSYO 2470.03 and NESC/PSYO 2190.03, or instructor's consent
CROSS-LISTING: PSYO 3790.03

NESC 3970.03: Molecular Neuroscience.

This class will continue ideas introduced in NESC 2570.03 on the molecular basis of neuronal function and of the role of gene expression in the functioning and development of the nervous system. We will introduce the role of G-proteins and their receptors in neuronal signalling, and of second messengers in neuronal function and development. We will extend into areas of neuronal development, especially of gene regulation in the nervous system, transcription and transcription factors, as well as the molecular control of neural development, especially through the control of cell differentiation and the outgrowth of axons in the nervous system and the specificity of their connections, and neuron-target interactions, especially through the role of trophic factors.

INSTRUCTOR: Staff
FORMAT: Lecture 3 hours
PREREQUISITE: NESC/PSYO 2570.03
CROSS-LISTING: PSYO 3970.03

4000-level Seminars

These seminars (4000-4440) are intended for 4th year honours students. Third-year honours students are eligible provided they obtain permission from the instructor, and the needs of all the fourth-year honours students have been met. The topics covered in these classes vary from year to year. Consult the department for the specific class descriptions.

NESC 4000.03: Senior Seminar.

See class description for PSYO 4000.03 in the Psychology section of this calendar.
INSTRUCTOR: Staff
FORMAT: Lecture 2 hours
CROSS-LISTING: PSYO 4000.03

NESC 4050.03: Topics in Perception.

This class explores the neural basis of perception, emphasizing the visual, tactile and auditory senses.
INSTRUCTOR: Staff
FORMAT: Lecture 2 hours
CROSS-LISTING: PSYO 4050.03

NESC 4070.03: Neuroscience Seminar.

INSTRUCTOR: Staff
FORMAT: Lecture 2 hours
PREREQUISITES: NESC/PSYO 2470.03, 2570.03 and 3270.03, or instructor's consent
CROSS-LISTING: PSYO 4070.03, ANAT 5070.03

NESC 4130.03: Topics in Human Information Processing.

INSTRUCTOR: Staff
FORMAT: Lecture 2 hours
CROSS-LISTING: PSYO 4130.03

NESC 4160.03: Topics in Behavioural Biology.

INSTRUCTOR: Staff
FORMAT: 2 hours
CROSS-LISTING: PSYO 4160.03

NESC 4374.03: 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 within various body systems will be covered, including the central and peripheral nervous systems, the cardiovascular system and the immune system. Drugs that assist or regulate host defence mechanisms will also be studied. 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.

INSTRUCTOR: J. Blay
FORMAT: Lecture 3 hours
PREREQUISITE: Upper level physiology or instructor's consent
CROSS-LISTING: PHAC 5406.03, BIOC 4804.03, BIOL 4404.03

NESC 4375.03: Introduction to Pharmacology II.

This class is intended to cover specific aspects of drug action in greater depth than NESC 4374.03 and to provide students with practical experience in pharmacology and a perspective on pharmacological research. The laboratory component consists of practical exercises using various techniques, as well as computer simulations. The practicalities of drug marketing are briefly considered. Instructor's consent and signature are required.

INSTRUCTOR: J. Blay
FORMAT: Lecture 1 hour, lab 3 hours
PREREQUISITES: NESC 4374.03 and instructor's consent
CROSS-LISTING: BIOL 4405.03, BIOC 4805.03, PHAC 5407.03

NESC 4500.06: 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: D. Phillips and V. Lolordo

RESTRICTION: Restricted to honours students in their graduating year

CROSS-LISTING: PSYO 4500.06

SCIE 3000.06: Science Fundamentals.

See class description in Science, Interdisciplinary section of this calendar.

Nursing

School of Nursing

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Dean

McIntyre, L., MD, MHS, FRCP(C)

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Wight Moffatt, C.F., BN (MUN), MS (Boston), RN

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Bleasdale, B., BN (Dal), RN

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Amirault, M., BA (Acadia), MN (Dal), RN
Attenborough, R., BN, MN (Dal), RN
Bayer, M.J., BN (Dal), MEd (Acadia), PhD (Dal)
Bowes, D., BN (Dal), RN
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Ryan, M., BN (Dal), MN (Calgary), RN
Sheppard-LeMoine, D., BN (Dal), RN
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Vandewater, D., BN, MN (Dal), RN
Walls, C., BN (Dal), MN (Dal), RN
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Woodworth, L., BN (Dal), BSc(N) (McG), RN
Worth, N., BScN, MN (Alta), RN
Wuest, J., BScN (Uof T), MN (Dal), PhD(N) (Wayne State), RN
Zevenhuizen, J., BN, MN (Dal), RN

Cross Appointments

Mann, K., BScN (Dal), MSc (Dal), PhD (Dal), Associate Dean,
Faculty of Medicine
Singleton, J., BA (Waterloo), MS (Penn State), PhD (Maryland),
Associate Professor, School of Recreation, Physical & Health
Education

Preceptors

Many nurses and persons in other disciplines provide valuable assistance in the education of the nursing students. Names can be obtained by contacting the School of Nursing.

I. Introduction

The School of Nursing opened in 1949 and became a constituent part of the Faculty of Health Professions in 1961. Currently the School offers an undergraduate programme for Basic and Post Diploma students and a Masters of Nursing Programme. Beginning in 1998, the School of Nursing and Nunavut Arctic College in Iqaluit will offer a BScN Programme in Arctic Nursing for Inuit to be offered in Iqaluit and on site in rural locations in Nunavut.

A. School of Nursing Regulations

1. Students are required to observe the University Regulations and Academic Regulations as described in this calendar.
2. Students are assessed in each year on their aptitude and fitness for nursing. A student who, in the judgment of the faculty, fails to attain a satisfactory standard in this assessment may be required to withdraw from the School.

3. It is an individual student's responsibility to ensure that they are registered in appropriate classes throughout the programme. Incorrect registration, at any time, could cause conflicts in a student's year-to-year progression and/or graduation.
4. Students in the Baccalaureate Programme 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. Additional expenses are incurred by students in the Basic Baccalaureate Programme for field experience, books, first aid course, CPR course, graduation pin, equipment, and nurse registration examinations and recommended and/or required immunizations and/or testing. Each student must also purchase name tags and crests from the University.
5. Because of enrolment limits on class size, all part-time students who wish to change to full-time status must present this request in writing to the Associate Director of Undergraduate Student Affairs by March 1.
6. Students are assigned to a faculty member from the Academic Advising Committee to help them plan their academic programme and to discuss academic progress or difficulties.
7. Students wishing to appeal a decision based on faculty regulations or decisions should follow the School of Nursing Appeal Procedure outlined in the Nursing Student Manual.

B. School of Nursing Appeal Procedure

An appeal is a request for alteration of a decision which is based on School or Faculty regulations (academic matters). 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.

The University has established a system which allows the student to appeal an academic decision made by faculty. This appeal can be heard at different levels within the University: At the School and at Senate. Appeals are heard in the School by the Committee on Studies and at Senate level by the Senate Academic Appeals Committee.

C. Procedure for Undergraduates Appeals

Undergraduate appeals are heard by the Committee on Studies of the School of Nursing. Procedures for Undergraduate Appeals are available from the School.

II. Degree Options

A. Bachelor of Science (Nursing) for Basic Students

1. Degree Requirements

Throughout the undergraduate programme a student must: obtain a minimum cumulative GPA of 2.00; accumulate a minimum of 129 credit hours; successfully complete all compulsory classes, as well as the necessary number of elective classes; and, complete the degree within six years of commencing nursing classes. Credit will be given for non-nursing classes that are up to ten years old by the date the degree is completed.

2. 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.

3. Grades

The following letter-grade system is used to evaluate performance. Pass in non-nursing classes: A+, A, A-, B+, B, B-, C+, C, C-, D, and P, except in nursing classes where students must attain a minimum of C in both theory and clinical/laboratory components. FM, F, and INC are failing grades. ILL and W are considered neutral.

4. Requirements for Promotion

Besides meeting the GPA requirements students must meet the following for promotion:

Year I to Year II: A student must pass all 1000-level classes in order to advance to 2000-level nursing classes.

Year II to Year III: A student must pass all second-year nursing classes, MICR 1100.03, STAT 1060.03 and SOSA 1000.06.

Year III to Year IV: A student must pass all 3000-level nursing classes.

5. Normal Workload

The programme consists of 129 credit hours (21.5 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 33 credit hours (5.5 credits)

Year IV: A normal workload is considered 30 credit hours (5 credits)

6. Advanced Standing

Students with a prior science degree and/or sufficient number of relevant university credits may complete the BScN programme in a minimum of three years. To qualify, students must have a GPA of at least 3.0. NOTE: This advanced standing option is available for Basic students only. For more information contact the Undergraduate Programme Secretary, Admissions.

B. Bachelor of Science (Nursing) for Registered Nurses

1. Degree Requirements

A student must: obtain a minimum cumulative GPA of 2.00 throughout the entire undergraduate programme; accumulate a minimum of 78 credit hours and successfully complete all compulsory classes, as well as the required number of elective classes; and, complete the degree within six years of commencing nursing classes. Note: Credit will be given for non-nursing classes that are up to ten years old by the date the degree is completed.

2. Other Regulations

Students must submit proof of Nurse Registration as an active practicing member in Nova Scotia or proof of the province/country of residence for each year that they are enrolled at the School of Nursing. All other regulations are as outlined in the BScN Basic stream in the University Calendar, including Immunization, and Grades.

The RNANS recognizes university credit hours as transferrable practice hours (e.g., a half-credit class [three credit hours], is equivalent to 180 practice hours in total). Full-time student status in a BScN (Post-RN) degree programme constitutes 1,725 practice hours, the equivalent of working full-time.

3. Normal Workload

The 78 credit hours of study may be completed over two academic years of full-time study and one academic year of part-time study.

The clinical major option in mental health/psychiatric nursing for Registered Nurses is a six-class component of the BScN (RN) degree programme. The classes selected for this option have been adapted to meet the learning needs of practising mental health nurses, and are designed to give nurses the opportunity to significantly enhance their knowledge and skill in this specialty.

The clinical major option in mental health is available via distance technology to centres in Nova Scotia. On completion of the six classes, students will receive a certificate and may choose to continue in the BScN (RN) student to complete the remaining requirements to attain their BScN degree.

C. Bachelor of Science Nursing (Arctic Nursing)

Beginning in 1998, the School of Nursing, in collaboration with Nunavut Arctic College in Iqaluit, will offer a BScN student in Arctic Nursing to prepare Inuit nurses for practice in the rural northern communities of Nunavut. Information about this programme is available from the School of Nursing.

D. Graduate Programme

For details of the Master's of Nursing Programme, please consult the Faculty of Graduate Studies calendar.

III. Bachelor of Science (Nursing) Degree Programme

In response to a health care system based on principles of primary health care, the Bachelor of Science (Nursing) programme at Dalhousie prepares nurses to work in partnerships with individuals, families, groups and communities to promote, maintain and strengthen health. Graduates are prepared to respond to a range of health and illness needs of human beings in a variety of settings and organizational health care infrastructures. In keeping with the direction of the Nova Scotia Health Care System in regard to collaboration, the School of Nursing has committed itself to partnerships with the Nova Scotia Department of Health, the Queen Elizabeth II Health Sciences Centre, the Western Regional Health Centre (Yarmouth), the Grace Maternity Hospital, the Nova Scotia Hospital and the Reproductive Care Programme of Nova Scotia in the design and delivery of its basic and Post-RN BScN Programmes. The curriculum is designed to enable graduates to meet the standards of nursing practice in Canada and be eligible for registration in Nova Scotia.

In addition to the Dalhousie Campus, students may complete a BScN degree on site in Yarmouth. Students interested in this option should contact the School for further information.

Beginning January 1998, the School of Nursing will offer selected classes in the Post-RN Programme through distance technology.

Programme Objectives

The Bachelor of Science (Nursing) graduate will:

1. Be a nurse who demonstrates application of nursing science through independent thought, critical inquiry, and commitment to life-long learning.
2. Nurse competently,* applying the principles of primary health care to persons with diverse needs and in a variety of health care settings.
3. Communicate and collaborate with individuals, families, groups, communities and other members of the health care team to achieve current health goals.
4. Reflect ethical, legal, and professional accountability in the practice of nursing.
5. Influence nursing and health care on a professional, social and political basis.

*Competence: includes interpersonal, technological and intellectual skills.

A. 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.

1. Immunization

Before commencing first-year studies, 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 \$75 (based on 1997-98 costs).

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 for a fee of \$5. This information must be sent to the Undergraduate Programme Secretary - Records, School of Nursing. Students failing to provide this evidence will be withdrawn from clinical areas.

2. CPR, (BCLS) & Standard First Aid Certification

Students must show proof of CPR (level C) and Standard First Aid certification before entering clinical in first year. CPR (level C) must be recertified annually. This proof is to be sent to the Undergraduate

Programme Secretary, Records, School of Nursing. A cardio-pulmonary resuscitation (CPR) course and standard first-aid course are the student's responsibilities in time and cost.

3. Course of Study

The following is an outline of classes that are normally taken each year.

This curriculum pertains only to students starting their first year of the programme in 1995 or later. Students who began their first year of the Nursing Programme before 1995 should refer to the calendar from their year of entry for their Course of Study.

First Year

- ANAT 1010.03
- BIOC 1420.03
- CHEM 1410.03
- PHYL 1010.06
- PSYO 1000.06
- NURS 1000.03
- NURS 1020.03
- NURS 1240.03 (NURS 1240.03 is a three-week clinical class starting in late April or early May with annual variations)

Second Year

- MICR 1100.03
- SOSA 1000.06
- STAT 1060.03
- NURS 2050.03
- NURS 2060.03
- NURS 2090.03
- NURS 2200.03
- NURS 2220.06
- NURS 2240.03
- Three credit hours of electives chosen from any Faculty. This elective is to be at the 2000-level or above except for a language class (French, German, Russian, Spanish) which can be taken at the 1000-level.

NURS 2220.06 is a six-week clinical nursing class usually starting in late April or early May with annual variations.

Third Year

- NURS 3020.03
- NURS 3030.03
- NURS 3080.03
- NURS 3200.03
- NURS 3240.03 (Intersession)
- NURS 3250.03 (Intersession)
- NURS 3260.03
- NURS 3270.03
- NURS 3280.03
- Six credit hours of electives
- Human Sexuality Workshop Part I is integrated into NURS 3020.03.

NURS 3250.03 and NURS 3240.03 are clinical nursing classes usually starting in late April or early May with annual variations.

Fourth Year

- NURS 4010.03
- NURS 4030.03
- NURS 4040.03
- NURS 4210.03
- NURS 4220.03
- NURS 4250.03
- NURS 4260.03
- One nursing elective (3 credit hours)
- NURS 4240.06
- Human Sexuality Part II is integrated into NURS 4010.03.

NURS 4240.06 is a five-week clinical nursing class usually beginning around the end of April.

B. Bachelor of Science (Nursing) for Registered Nurses

The Bachelor of Science (Nursing) for registered nurses consists of 78 credit hours of study. Students may complete the programme through full- or part-time study. The programme can be completed in two calendar years of full-time study provided Faculty 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 year (Sept. - April). Part-time students who wish to change their status to full-time must write their request to the Associate Director of Undergraduate Student Affairs by March 1.

The Dalhousie Bachelor of Science Nursing Collaborative Project in Yarmouth includes study for the BScN (Post-RN) degree. The programme can be completed on a full or part-time basis. Although successful students register with and graduate from Dalhousie University, the programme is offered on site in Yarmouth through innovative technologies, on-site professors, and visiting professors (with the exception of chemistry for which students are bused to Université Ste. Anne in Church Point) once per week during the first year of the programme.

The Perinatal Education Partnership Project (PEPP) is a unique approach to providing specialty education for practicing perinatal nurses. The classes for the BScN/RN (PEPP Stream) are based on Dalhousie University BScN curriculum framework with specific emphasis on perinatal health care.

Students who enrol in the BScN/RN (PEPP Stream) may complete five selected core classes of the BScN/RN curriculum and exit with a certificate of completion from the PEPP, as well as a Dalhousie University transcript indicating completion of the five classes. They may then choose to continue in the BScN/RN programme to complete the remaining requirements for the degree.

The clinical major option in mental health/psychiatric nursing for Registered Nurses is a six class component of the BScN (RN) degree program. The classes selected for this option have been adapted to meet the learning needs of practising mental health nurses, and are designed to give nurses the opportunity to significantly enhance their knowledge and skill in this specialty.

The clinical major option in mental health is available via distance technology to centres in Nova Scotia. On completion of the six classes, students will receive a certificate and may choose to continue in the BScN (RN) program to complete the remaining requirements of the BScN degree.

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 they are offered (Fall, Winter, Spring, Summer). Certain classes may have prerequisites as noted in the class descriptions. Part-time students are encouraged to complete most of the required non-nursing classes before starting nursing classes. 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: ANAT 1010.03, PHYL 1010.06, CHEM 1410.06, PSYO 1000.06, SOSA 1000.06, MICR 1100.03, STAT 1060.03. The nine credit hours of electives may be chosen from any Faculty and are to be at the 2000-level or above except in the case of a language (French, German, Russian, Spanish) which can be taken at the 1000-level.

Required Nursing Classes

- *NURS 2070.03: Analysis and Development of Therapeutic Communication in Nursing
- *NURS 2250.03: Foundations for Contemporary Practice
- *NURS 3020.03: Learning Transactions in Nursing
- NURS 3030.03: Nursing Research
- *NURS 3270.03: Nursing Practice: Caring for Families
- NURS 4010.03: Social Justice Issues in Health Care Practice

- NURS 4030.03: Collaborative Leadership for Nursing Practice
- NURS 4040.03: Therapeutic Communication in Complex Situations
- NURS 4250.03: Community Health Assessment
- NURS 4260.03: Community Development and Advocacy
- Nursing Electives (6 credit hours)
- The six credit hours of electives may be chosen from Nursing and Interdisciplinary classes. Class selections vary by year. Please consult the current years timetable for class offerings:
- NURS 3200.03: Nursing Practice - Short Term Alternatives in Health
- NURS 3250.03: Nursing Practice IV - Intersession
- NURS 3260.03: Nursing Practice - Mothers, Infants and Childbearing Families
- NURS 3280.03: Nursing Practice - Long Term Alterations in Health
- NURS 4210.03: Nursing Practice: Children and Families
- NURS 4220.03: Mental Health Nursing Practice
- NURS 4233.03: Specialized Mental Health Nursing Practice: Counselling and Group Intervention
- NURS 4340.03: Palliative Care: Theory and Practice

Please refer to specific class descriptions.

IV. Class Descriptions

A. Required Classes

NOTE:

- (a) Indicates PEPP required classes.
- (b) For all Nursing classes, Section 02 is restricted to students registered in the PEPP programme and Section 03 is restricted to students registered in the Yarmouth programme. Section 04 is restricted to students registered in the Mental Health Option.

ANAT 1010.03: Basic Human Anatomy.

See class description in Anatomy section of this calendar.

BIOC 1420.03: Introductory Biochemistry.

See class description in the Biochemistry section of this calendar.

CHEM 1410.03: Introductory Chemistry.

See class description in Chemistry section of this calendar.

MICR 1100.03: Health Science Microbiology.

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.

NOTE: Students registering in this class must also register for either a morning or afternoon laboratory session.

FORMAT: Lecture 3 hours, lab 3 hours

NURS 1000.03: Introduction to the Foundations of Nursing.

Major concepts of health and professional nursing are introduced. Learners begin to develop an awareness of the practice of nursing based on the determinants of health, primary health care and major nursing concepts. Emphasis will be given to the helping role of nursing. A variety of experiences will facilitate learning. Students are introduced to the practice of nursing in clinical settings.

FORMAT: Lecture 2 hours, lab 2 hours

NURS 1020.03: Human Development and Health.

Examines concepts and theories of healthy growth and development across the life-span. Content is organized around health, nutrition, and the safety of individuals at specific stages in their physical, cognitive, and psychosocial development. Concepts of

culture/ethnicity, environment, economic status and other life situations are introduced in terms of their relationship to optimal health.

FORMAT: Lecture 3 hours

NURS 1240.03: Introduction to Nursing Practice.

(Intersession) Students are introduced to health care settings where they will interact with persons at different stages of development, health and illness. As a basis for these experiences the foundations of nursing addressed in NURS 1020.03 are further developed. Learning experiences are designed to promote beginning knowledge and skills for the practice of nursing with an emphasis on helping relationships.

FORMAT: Lecture 15 hours, clinical 15 hours/week for 3 weeks

PREREQUISITES: NURS 1000.03, 1020.03

NURS 2050.03: Pharmacology and Nursing.

Introduces students to the pharmacokinetics of the major classes of drugs. Includes the study of the absorption, distribution, metabolism, and excretion of drugs as well as side effects of medications and their implications for nursing practice. Periodic laboratory sessions are scheduled for learning about drug administration as a basis for the nursing domain of administering and monitoring interventions and regimens.

FORMAT: Lecture 3 hours

PREREQUISITE: NURS 2200.03

NURS 2060.03: Legal and Ethical Issues in Nursing Practice.

Designed to promote student understanding and application of ethical and legal concepts and theory within the dimensions of nursing practice. Students focus on the decision-making processes and the impact of technology in nursing practice.

FORMAT: Lecture 3 hours

PREREQUISITE: NURS 2220.06 for Basic Students; None for Post-Diploma students

***NURS 2070.03: Analysis and Development of Therapeutic Communication in Nursing.**

(For Post-Diploma Students only.) Enables students to build on their existing communication, knowledge and skills developed through their practice. The focus is on strategies for enabling clients to be active participants in health care. Students use several interaction theories to critically analyze their own communication skills and their impact on clients and colleagues. Students analyze the critical aspects of the caring role of the nurse in relation to other domains of nursing practice. (This class can be challenged, contact the Undergraduate Programme Secretary - Records, for more information.)

FORMAT: Lecture 2 hours, lab 2 hours

RESTRICTION: Section 02 is restricted to students registered in the PEPP programme. Section 04 is restricted to students registered in the clinical major option in mental health.

* This class and NURS 2250.03 are prerequisite to all other clinical nursing classes for Post-Diploma students.

NURS 2090.03: Pathophysiology and Nursing.

Provides a foundation for understanding human physiological responses to altered health states in terms of structural and functional changes from normal. This class is basic to (1) the understanding and practice of the monitoring and diagnostic domain of nursing practice and (2) for administering and monitoring interventions and regimens.

FORMAT: Lecture 3 hours

PREREQUISITES: MICR 1100.03, ANAT 1010.03, PHYL 1010.06 or instructor's consent

NURS 2200.03: Knowledge and Process in Nursing Practice I.

The student uses theoretical bases of nursing to evaluate persons' health behaviours and outcomes in carrying out nursing roles. The student focuses on learning health assessment, and the diagnostic and client monitoring functions, as well as administering and

monitoring interventions and regimens. The student is introduced to nursing research to guide reflective nursing practice, and applies safe use of technology and caring approaches in laboratory settings.

FORMAT: Lecture 2 hours, lab 2 hours

PREREQUISITES: NURS 1240.03, ANAT 1010.03, PHYL 1010.06, CHEM 1410.03, BIOC 1420.03, PSYO 1000.06/1100.06/1200.06

NURS 2220.06: Nursing Practice II.

(Intersession) This clinical practicum enables students to begin to integrate primary health care principles, nursing knowledge and theory, and nursing processes within the domains of nursing practice. The student consolidates concepts, theories and skills in caring for individuals in acute and chronic care settings. Emphasis is placed on collaborating with clients to identify health goals as well as perceptions and attitudes about their health.

FORMAT: Clinical practicum 240 hours/6 weeks

PREREQUISITES: NURS 2050.03, 2090.03, 2060.03, 2240.03, MICR 1100.03

NURS 2240.03: Knowledge and Process in Nursing Practice II.

Develops student competence in the use of the domains of nursing practice learned in NURS 2200.03. The students integrate comprehensive health assessments as a basis for clinical interventions inherent in the caring role. In addition, students are introduced to the organizational and work role competencies required for clinical practice. This class includes clinical and laboratory practice.

FORMAT: Lecture 2 hours, clinical/lab 4 hours

PREREQUISITE: NURS 2200.03

***NURS 2250.03: Foundations for Contemporary Nursing Practice.**

(For Post-Diploma students only.) Provides experienced nurses with opportunities to focus on the evolution of nursing as a profession and the domains of nursing practice. Through an exploration of theories from nursing and other disciplines relevant to nursing, students are challenged to critically examine their nursing practice and to explore areas for change. Clinical experiences in hospitals and community-based agencies provide opportunities to carry out comprehensive health assessment skills.

FORMAT: Lecture 2 hours, clinical 4 hours

RESTRICTION: Section 02 is restricted to students registered in the PEPP programme. Section 04 is restricted to students in the clinical major option in mental health.

* This class and NURS 2070.03 are prerequisite to all other clinical nursing classes for Post-Diploma students.

***NURS 3020.03: Learning Transactions in Nursing.**

Learning transactions between nurses and clients are integral to health promotion and illness prevention. This class is designed to assist students to critically analyze and integrate the teaching-coaching domain of nursing practice in relation to the helping role of the nurse. Principles and theories of learning are used to identify strategies to help clients acquire knowledge, skills and attitudes that empower them to attain and maintain optimal levels of health. To develop self-knowledge as well as interdisciplinary learning and interaction skills, students participate in a workshop that explores the nature of healthy human sexuality across the life span.

FORMAT: Lecture 3 hours

PREREQUISITE: NURS 2220.03 for Basic students; Post-Diploma students should be aware there are resources available to facilitate the development of their writing skills

RESTRICTION: Section 02 is restricted to students registered in the PEPP programme. Section 04 is restricted to students registered in the clinical major option in mental health.

***NURS 3030.03: Nursing Research.**

The research process is examined in relation to nursing. Through the study of the critical thought processes basic to research methodology, measurement techniques and ethical and legal issues, the student integrates research-based nursing knowledge with practice.

FORMAT: Lecture 3 hours

PREREQUISITES: NURS 2220.06 and STAT 1060.03 for Basic students; STAT 1060.03 for Post-Diploma students or instructor's consent

NURS 3080.03: Culture, Caring and Health Care.

Designed to promote student awareness of the Canadian mosaic, race relations, cross-cultural communications issues and the impact of culture on health beliefs and client access to the health care system. Students explore their own attitudes and approaches to other cultures. Through this exploration, the student identifies culturally sensitive strategies for health care practices.

FORMAT: Lecture 3 hours

PREREQUISITE: NURS 1240.03 for Basic Students; NURS 2250.03 or instructor's consent for Post-Diploma students

NURS 3200.03: Nursing Practice: Short-Term Alterations in Health.

Students learn to integrate nursing knowledge and processes in the care of adults coping with acute illnesses. Emphasis is placed on the integration of primary health concepts as related to short-term alterations in health. Students further develop knowledge and skill in the domains of nursing practice during clinical experiences in acute care settings.

FORMAT: Lecture 2 hours, clinical 6 hours

PREREQUISITE: NURS 2220.06

NURS 3240.03: Nursing Practice III.

(Intersession) Integration and application of concepts, theories and skills essential for nursing practice with adult and elderly persons experiencing illness is the focus of this hospital-based practicum. Analysis and integration of research-based knowledge in the synthesis of the domains of practice will be incorporated within a caring context.

FORMAT: Clinical practicum 120 hours/3 weeks

PREREQUISITES: NURS 3020.03, 3270.03, 3280.03

NURS 3250.03: Nursing Practice IV.

(Intersession) This clinical practicum continues the integration and application of concepts, theories and skills essential for reflective nursing practice with individuals, families and aggregates within community health agencies. The focus of this practicum is on the principles of primary health care and the application of skills related to community development and collaborative leadership.

FORMAT: Clinical Practicum 120 hours/3 weeks

PREREQUISITE: NURS 3020.03, 3260.03, 3270.03

NURS 3280.03: Nursing Practice: Mothers, Infants and Childbearing Families.

Students focus on the integration of the domains of nursing practice in caring for mothers and newborn infants within the context of the childbearing family. The nature of the childbearing experience will be critically analyzed from the perspective of the determinants of health as well as the theoretical bases of maternal-infant attachment and nurse caring. Clinical experience with clients during pregnancy, birthing and postbirth in hospital and home settings enable students to focus on health promotion within the context of family-centred care.

FORMAT: Lecture 3 hours, clinical 6 hours

PREREQUISITE: NURS 2220.06 for Basic students

RESTRICTION: Section 02 is restricted to students registered in the PEPP programme.

NURS 3270.03: Nursing Practice: Caring for Families.

Students focus on families and family health and well being with an emphasis on a thorough understanding of family assessments. Students examine family health and health issues from nursing, cultural, sociological and psychological theories and concepts as they relate to nursing practice in providing care to the family as a client group. A variety of family assessment approaches are critically analyzed. Laboratory and clinical experiences with families provide the student with opportunities to integrate and practice family assessment.

FORMAT: Lecture 2 hours, clinical 6 hours

PREREQUISITES: NURS 2220.06 for Basic students; NURS 2250.03 and NURS 2070.03 are strongly recommended for Post-Diploma students

RESTRICTION: Section 02 is restricted to students registered in the PEPP programme. Section 04 is restricted to students who are registered in the clinical major option in mental health.

NURS 3280.03: Nursing Practice: Long-term Alterations in Health.

Building on NURS 3200.03, this class focuses on family-centred nursing practice with adults who are managing chronic health problems. Students continue to critique and integrate theory-based nursing strategies and the principles of primary health care in demonstrating reflective nursing practice. Experiences in hospitals and long-term settings enable students to participate in the care of adults with chronic health problems.

FORMAT: Lecture 2 hours, clinical 6 hours

PREREQUISITES: NURS 3020.03, 3200.03

NURS 4010.03: Social Justice Issues in Health Care Practice.

Certain inequities make it impossible for some communities to be as healthy as others. This class is designed to address poverty, unemployment, racism, illiteracy, violence, rural isolation, ageism, ableism, sexism, classism, militarism as well as environmental issues. The student reflects upon implications of competitive versus cooperative ideologies to examine how society is structured and how it functions. Furthermore, the student analyzes social action approaches to address the dynamic impact that these issues have on achieving health and identify strategies for social action. As a required part of this class, students participate in an interdisciplinary learning opportunity that examines the relationship of human sexuality issues with those of social justice.

FORMAT: Lecture 3 hours

PREREQUISITES: NURS 3240.03, 3250.03 for Basic students; Second and third year Nursing classes are strongly recommended for Post-Diploma students

NURS 4030.03: Collaborative Leadership for Nursing Practice.

Based on the view that the practice of leadership is the practice of every nurse, the focus of the class is on the leadership theory and behaviours essential to nursing practice. Critical thinking, decision-making processes and other leadership behaviours will be achieved through experiential and simulated learning methods.

FORMAT: Lecture 3 hours

PREREQUISITES: NURS 3240.03 and 3250.03 for Basic students;

Second and third year Nursing classes are strongly recommended for Post-Diploma students

NURS 4040.03: Therapeutic Communication in Complex Situations.

The focus of this class is the critical analysis of interactive and relationship theories in the practice of nursing with client groups. Application of theories in simulated laboratory situations enables the student to develop reciprocal, interactive skills in complex collaborative situations such as those requiring confrontation, advocacy and leadership.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: NURS 3240.03 and 3250.03 for Basic students;

Post-Diploma students must have completed NURS 2070.03 or have successfully challenged the class

NURS 4210.03: Nursing Practice: Children and Families.

Students focus on nursing practice in the care of children and families. The determinants of child and family health are examined, as well as the role of nursing practice in health promotion and illness prevention for children. Clinical and family issues associated with childhood illness and hospitalization draw on knowledge of child and family development as well as basic arts, science and

nursing knowledge. Students work in clinical settings where care is provided to children with acute and chronic illness and their families.

FORMAT: Lecture 2 hours, clinical 6 hours

PREREQUISITES: NURS 3240.03, 3250.03

NURS 4220.03: Mental Health Nursing Practice.

Integrating a holistic perspective within a primary health care philosophy, this class focuses on the promotion of individual and community mental well-being. Through reflective practice, students assist clients through the challenges of mental health problems, crisis and mental disorders. Using nursing theories and effective communication skills, students help clients transform personal experiences. Students will appreciate the social responsibility of the nursing profession through not only direct care, but also, client advocacy.

FORMAT: Classes 2/week, clinical 6/week

PREREQUISITES: NURS 3240.03, 3250.03

NURS 4240.06: Nursing Practice V.

(Interession) The focus of this practice-based class is on synthesis of the domains of nursing practice with learned knowledge and processes. Students integrate leadership knowledge and behaviours within social health care systems. Collaboration and advocacy with clients, other health care professionals and peers are emphasized. The student may choose a clinical setting based on their learning needs and interests.

FORMAT: Clinical practicum 200 hours/5 weeks

PREREQUISITES: NURS 4010.03, 4030.03, 4040.03, 4210.03, 4220.03, 4250.03, 4260.03

NURS 4250.03: Community Health Assessment.

Community health is a vital component of primary health care. The focus of this class is on the integration of community assessment theory and nursing practice in health promotion and illness prevention. Collaboration with individuals, families, groups, communities and other health care professionals in working towards health goals will be emphasized. The student will apply critical thinking in assessing needs and strengths for community development in a variety of community settings.

FORMAT: Lecture 2 hours, clinical 6 hours

PREREQUISITES: NURS 3240.03 and 3250.03 for Basic students;

Post-Diploma students NURS 2250.03, 2070.03, 3020.03, 3030.03, and 3270.03 are strongly recommended

NURS 4260.03: Community Development and Advocacy.

Builds on the content of NURS 4200.03. The focus is on critical thinking, intervention strategies and the evaluation of community health nursing strategies with client groups and communities. Community development through collaboration of health care agencies and community agencies with groups will be analyzed. Clinical experience in a variety of community settings will allow the student to apply the domains of nursing practice in a reflective manner to improve the health of the community as a whole.

FORMAT: Classes 2/week, clinical 6/week

PREREQUISITE: NURS 4250.03

PHYL 1010.06: Human Physiology.

See class description in the Physiology and Biophysics section of this calendar.

B. Nursing Elective Classes

Basic students are required to complete 3 credit hours of nursing electives. Post RN students must complete 6 credit hours of nursing electives. NOT ALL NURSING ELECTIVES ARE OFFERED EVERY YEAR. Please consult the School to ascertain the 1998-99 offerings. When resources allow, the following are offered:

NURS 4320.03: Transcultural Nursing.

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: Lecture 3 hours

NURS 4330.03: Self-Directed Learning.

Students may carry out an independent study or project related to the theory or practice of nursing, under the direction of a 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

CROSS-LISTING: NURS 5950.03

NURS 4340.03: Palliative Care; Theory and Practice.

This class will provide a general overview of the significant issues facing individuals and their families related to life threatening illness and dying. Research findings, theories of pain and symptom management, grief and loss, communication, and coping and their significance for palliative care nursing practice will be explored. The impact of health care reform on services for clients with life threatening illness (LTI) and the role of the nurse within palliative care will be a focus.

FORMAT: Lecture 2 hours

PREREQUISITES: NURS 2070.03, 2220.03, 2250.03

CROSS-LISTING: NURS 5830

NURS 4360.03: Management - The Process in Health Care Agencies.

Focuses on management of resources to achieve goals within health care agencies and institutions. The agency/ institution is viewed as a system within which each manager uses a variety of theory and practice based techniques to establish goals, plan and utilize resources and evaluate outcomes. Emphasis is placed on the day-to-day use of management strategies, techniques and skills. Relevant theoretical constructs and research will be explained and discussed while examining its implications for practice. Current management problems in nursing will be explored. This is a beginning level class in management with emphasis on managing nursing.

FORMAT: Lecture/seminar

PREREQUISITE: NURS 4030.03, or instructor's permission

C. Interdisciplinary Nursing Elective Classes

HLTH 3000.03: An Interdisciplinary Approach to Health Promotion.

Qualifies as a Nursing elective. See class description in Health Professions, Interdisciplinary section of this calendar.

HLTH 4900.03: An Interdisciplinary Approach to Gerontology (Social Perspectives).

Qualifies as a Nursing elective. See class description in Health Professions, Interdisciplinary section of this calendar.

HLTH 4910.03: An Interdisciplinary Approach to Gerontology (Health Perspectives).

Qualifies as a Nursing elective. See class description in Health Professions, Interdisciplinary section of this calendar.

NURS 4370.03: 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 1000.06, 1100.06, 1200.06, or two classes in Women's Studies

CROSS-LISTING: SOSA 3245.03/5245.03, WOST 3810.03, NURS 5850.03

NURS 4800.03: Interdisciplinary Class in Human Nutrition.

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.

FORMAT: Lecture 3 hours/week

PREREQUISITE: BIOL 1000.06 or instructor's consent

CROSS-LISTING: PHAR 4950.03, PHYT 3090.03, HRED 2250.03, NURS 5990

NOTE: A "strong recommendation" to complete one class before another means that some of the content of the new class draws directly on knowledge, skills and experience gained in a previous class. Students should realize that they may have to do some supplementary work in order to meet the expectations of the new class.

Occupational Therapy

School of Occupational Therapy

Location: Forrest Building, Room 215
5869 University Avenue
Halifax, NS B3H 3J5
Telephone: (902) 494-8804
Fax: (902) 494-1229

Dean

McIntyre, L., MD, MHSc, FRCP(C)

Director

Townsend, E., DipP & OT, BSc (OT) (Tor), MAdEd (St. FX), PhD (Dal)

Professor

O'Shea, B.J., DipP & OT (Tor), BSc (Queen's), MS (Colorado State)

Associate Professor

Doble, S.E., BSc (OT) (Western), MS (Boston)
Townsend, E., DipP & OT, BSc (OT) (Tor), MAdEd (St. FX), PhD (Dal)

Assistant Professors

Banks, S., BSc, MA (Dal)
Primeau, L., BSc (OT) (Western), MA, PhD (USC)
Smits, E., BSc (OT) (Western), MSc, PhD (Queen's)
Unruh, A., BSc (OT) (Western), MSW (Carleton), PhD (Dal)

Fieldwork Co-ordinator

Banks, S., BSc, MA (Dal)

Provincial Fieldwork Co-ordinators

Newfoundland: B. Head, BSc (OT) (Alberta)
Nova Scotia: S. Taylor, Dip OT (Queen's), MA (SMU)
Prince Edward Island: H. Cutcliffe, Dip OT (Man)

Adjunct Appointments

Clark, A.J., BSc, MD (Dal), Assistant Professor, Department of Anaesthesia, Faculty of Medicine
McGrath, P., BA, MA (Sask), PhD (Queen's), Professor, Department of Psychology, Faculty of Science
Spindler, M., DipP & OT (Tor)

Regional Facilities Currently Participating in the Fieldwork Programme

Practising occupational therapists in the Atlantic region give their time and expertise to a structured practical fieldwork education programme. The following sites provide fieldwork education for students:

New Brunswick

Bio-Engineering Institute, Fredericton
Campbellton Regional Hospital, Campbellton
Carleton Memorial Hospital, Woodstock
Centracare, Saint John
Centre hospitalier Restigouche, Campbellton
Chaleur Regional Hospital, Bathurst
Community Mental Health Services, Saint John
Dr. Everett Chalmers Hospital, Fredericton
Family and Community Social Services, Saint John
Father J. Angus MacDonald Centre, Moncton
Hopital Docteur George L. Dumont, Moncton

Hopital l'Enfant Jesus, Caraquet
Miramichi Regional Hospital, Miramichi
Moncton City Hospital, Moncton
New Brunswick Extra-Mural Program
Region 7 Hospital Corporation, Chatham/Newcastle
Saint John Regional Hospital, Saint John
St. Joseph's Hospital, Saint John
Stan Cassidy Centre for Rehabilitation, Fredericton
Sussex Health Centre, Sussex
Tobique Valley Hospital Inc., Plaster Rock
Worker's Rehabilitation Centre, Saint John

Newfoundland

Bay St. George Senior Citizen's Home, Stephenville Crossing
Burin Peninsula Health Care Centre, Burin
Carbonear General Hospital, Carbonear
Central Newfoundland Regional Health Centre, Grand Falls
Children's Rehabilitation Centre, St. John's
Community Health, St. John's Region
Dr. Charles L. LeGrow Health Centre, Port-aux-Basques
Dr. G.B. Cross Memorial Hospital, Clarenville
Fit for Work, St. John's
Health Care Corporation of St. John's, St. John's
Integrated Occupational Health Services, St. John's
Janeway Child Health Centre, St. John's
St. Clare's Mercy Hospital, St. John's
Therapeutic Consulting Ltd., Gander
Waterford Hospital, St. John's
Western Memorial Regional Hospital, Corner Brook

Nova Scotia

Cape Breton Health Care Complex
Cape Breton Regional Hospital Site, Sydney
Harbour View Hospital Site, Sydney Mines
Colchester Regional Hospital, Truro
Digby General Hospital, Digby
Eastern Shore Memorial Hospital, Sheet Harbour
Health Services Association of the South Shore, Bridgewater and Lunenburg
Hermes Electronics Ltd., Dartmouth
Hershey Canada Inc., Moirs Division, Dartmouth
Izaak Walton Killam - Grace Health Centre, Halifax
Multiple Sclerosis Society, Dartmouth
Nova Scotia Hospital, Dartmouth
Queen Elizabeth II Health Sciences Centre
Abbie J. Lane Site, Halifax
Camp Hill Site, Halifax
Nova Scotia Rehabilitation Site, Halifax
Victoria General Site, Halifax
Scotia Community Occupational Therapy Inc., Halifax
Soldier's Memorial Hospital, Middleton
St. Martha's Regional Hospital, Antigonish
Sunset Residential and Rehabilitation Services Inc., Pugwash
Yarmouth Regional Hospital, Yarmouth

Prince Edward Island

Community and Residential Services
Hillsborough Hospital, Charlottetown
Prince County Hospital, Summerside
Prince Edward Home, Charlottetown
Queen Elizabeth Hospital, Charlottetown
Workers Compensation Board, Charlottetown

I. 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.

II. What is Occupational Therapy?

Occupational therapy is a health profession that is concerned with what people do. Occupational therapists enable individuals, groups, organizations and communities to choose, organize and perform occupations that they find useful or meaningful in their environment. In this context, *occupation* is viewed broadly to include everything people do to "occupy" themselves in enjoying life, looking after themselves and others, and contributing to the social and economic productivity of their communities. *Health* is also viewed broadly as the ability and opportunity to live full and meaningful life.

Occupational therapists work with people, individually or collectively, to enable them to be active agents in shaping their personal lives and communities. Experiential, participatory approaches are used with people to identify and prioritize goals in everyday occupations, and to analyze the physical, mental, spiritual, and environmental strengths and barriers for realizing those goals. Collaborative planning is advocated to maximize choice in decision making. To be accountable, occupational therapists involve people in evaluating both the processes and outcomes of occupational therapy. Occupational therapists emphasize team approaches in which lay people and professionals, individuals, families, teachers, employers, managers, communities, and organizations, share power by working as partners.

A. Career Opportunities

Occupational therapy practice is broad in scope and offers a wide range of career opportunities for men and women. Occupational therapists work in either public or private sectors, with any age group, and with individual, group, organizational, or community clients. Work may be conducted in institutions, businesses, or communities. Career development is open and highly flexible. Occupational therapy leaders with Masters and Doctoral degrees in occupational therapy or related fields are in high demand in practice specialties, management, consulting, community development, policy development, programme development and evaluation, and academia.

Occupational therapy practice may enable occupation directly through individualized therapy, or indirectly through management, staff education, environmental modifications, policy development, advocacy, evaluation, research and more. Job opportunities are increasing in community health, health promotion, employment adjustment, human resource development, community development, public education, advocacy, homemaking and parenting support, research and other areas.

B. 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 provincial licensing bodies. Information on Atlantic provincial licensing regulations may be obtained from: the Nova Scotia Association of Occupational Therapists, Suite 740, 5991 Spring Garden Road, Halifax, Nova Scotia, B3H 1Y6; the New Brunswick Association of Occupational Therapists, c/o Occupational Therapy Services, Stan Cassidy Centre for Rehabilitation, 180 Woodbridge St., Fredericton, New Brunswick, E3B 4R3; 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.

C. 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, Suite 3400, 1125 Colonel By Drive, Carleton University, Ottawa, ON K1S 5R1. 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, Suite 740, 5991 Spring Garden Road, Halifax, Nova Scotia, B3H 1Y6; the New Brunswick Association of Occupational Therapists, c/o Occupational Therapy Services, Stan Cassidy Centre for Rehabilitation, 180 Woodbridge St., Fredericton, New Brunswick, E3B 4R3; the Prince Edward Island Occupational Therapy Society, PO Box 2248, Charlottetown, Prince Edward Island, C1A 8B9; the Newfoundland & Labrador Association of Occupational Therapists, PO Box 5423, St. John's, Newfoundland, A1C B1B.

D. 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 class load is 36, 35, and 34 credit hours respectively in years II, III, and IV (see Academic Regulation 4.1.3). For the purposes of residency, loan, and scholarship requirements 30 credit hours is considered a full class load in all years.

2. Grade Point Average Requirements

The grade point average system is described in the Academic Regulations, under 19.1.

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 2.00) 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 1.00 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 FM and be permitted to write a supplemental examination (Academic Regulation 18.5). Only one (one full credit or two part credit), supplemental examination is permitted in one year, and no more than three (full credit or equivalent) supplemental examinations are permitted during a student's degree program. Supplemental examinations in A classes must be written in February and in B and R classes in August, immediately following the failure. Supplemental examinations may not be deferred. Eligible students who wish to write a supplemental examination must submit a request in writing to the Director, School of Occupational Therapy by July 1 for August examinations and by January 15 for February examinations.

In cases where FM is not permitted or where a student fails to pass the supplemental examination, 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 OCCU 2222.00 for promotion to third year, and OCCU 3322.00 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 900 hours of fieldwork experience, additional to credit classes (OCCU 2222.00: 225 hours, OCCU 3322.00: 375 hours, OCCU 4420.00: 300 hours)

7. Class Changes

Academic Regulation 6 applies to all class changes in Occupational Therapy with the exception of 4000 level B classes.

The last day for adding all 4000-level B term Occupational Therapy classes without academic penalty is Friday of the first week following study break (see Schedule of Academic Dates).

The last day for withdrawing from all 4000-level B term Occupational Therapy classes, 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 minimum grade of A- in OCCU 4421.06 (independent research project).

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 minimum grade of A- in OCCU 4421.06 (independent research project).

10. Required Withdrawal From the Programme

A student is normally required to withdraw from the programme if at the end of the academic year:

- 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
- 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 is contained in the School of Occupational Therapy student handbook available from the School Office. Briefly, such an appeal should be addressed to the Chairperson of the School of Occupational Therapy Student Appeals Committee and must clearly state the arguments and expectations of the petitioner (see Academic Regulation 26.2).

iii. 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. This honours baccalaureate programme has been designed as an occupation based curriculum to emphasize the theoretical foundation and scientific principles which form the basis for occupational therapy practice.

With this knowledge base, the students are guided in the development of the competence 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. Graduates are 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 critical thinking, creative problem solving and the application of theoretical knowledge to guide the professional reasoning process. Occupation based practice is emphasized through both academic and field studies.

The emphasis on the scientific nature of occupational therapy practice peaks in the fourth year of the programme in which students are required to complete a research project in conjunction with their final fieldwork placement. This project addresses a research question pertinent to clinical, consulting, management, academic, or research 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 license to practice in provinces where practice is governed by statute.

IV. 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.

A. Fieldwork Education Component

Fieldwork is the practical component of the educational programme completed in practice sites in which students have direct contact with clients with the coaching guidance of a preceptor. The fieldwork programme is designed to provide students with opportunities to apply knowledge and develop competence in a variety of settings and with a broad range of 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 professional sites 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 six weeks of fieldwork during the summer months. In the third and fourth year, full-time fieldwork is included within the second academic term. During fieldwork, each student must gain a balance of experience in addressing problems arising from 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 area of vocational assessment. 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 (OCCU 4420.00) outside the Atlantic region for which there is a \$32.10 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. Student preference is constrained by limited availability of fieldwork placements.

Fieldwork hours are completed in the following pattern, calculated on the basis of a 37.5 hour week:

- Six weeks following Year 2: (OCCU 2222.00) 225.0 hours in the Atlantic region
 - Ten weeks beginning during Year 3: (OCCU 3322.00) 375.0 hours in the Atlantic region
 - Eight weeks following Year 3 or Year 4: (OCCU 4420.00) 300.0 hours outside of the Atlantic region
 - Seven weeks during Year 4: (as part of OCCU 4421.06) 262.5 hours in the Atlantic region
- TOTAL: 31 weeks; 1,162.5 hours

B. Academic and Fieldwork Course of Study

The prescribed first-year classes are listed in the section describing admission requirements.

Year 2

- ANAT 2170.06
- ANAT 2100.03
- PHYL 2030.06
- OCCU 2207.03
- OCCU 2208.03
- OCCU 2210.02
- OCCU 2213.03
- OCCU 2215.03
- OCCU 2218.04
- OCCU 2222.00
- STAT 1060.03 (if no previous credit in Statistics)
(36 credit hours)

Year 3

- PHYL 3110.03
- OCCU 3307.04
- OCCU 3308.03
- OCCU 3311.04
- OCCU 3318.04
- OCCU 3322.00
- OCCU 3333.06
- OCCU 3350.03
- OCCU 3360.03
- OCCU 3370.02
- One 3 credit hour elective in psychology or sociology, 2000 level or above.
(35 credit hours)

Year 4

- COMM 2001.03
- OCCU 4400.01
- OCCU 4404.03
- OCCU 4407.03
- OCCU 4419.06
- OCCU 4420.00
- OCCU 4421.06
- Six credit hours of electives in Occupational Therapy
- Six credit hours of electives chosen from Arts and Social Sciences, Management, Education, Health Professions, Science or Medicine, 2000 level or above
(34 credit hours)

All classes are completed during the normal academic year with the exception of OCCU 2222.00, 3322.00, and 4420.00 which are completed during the summer months (see class descriptions).

V. Classes Offered

ANAT 2170.06: Gross Anatomy.

See class description in Anatomy section of this calendar.

ANAT 2100.03: Neuroanatomy.

See class description in Anatomy section of this calendar.

COMM 2001.03: Introduction to Management

See class description in Commerce section of this calendar.

HLTH 4900.03: An Interdisciplinary Approach to Gerontology (Social Perspectives).

See class description in Health Professions, Interdisciplinary section of this calendar.

HLTH 4910.03: An Interdisciplinary Approach to Gerontology (Health Perspectives).

See class description in Health Professions, Interdisciplinary section of this calendar.

OCCU 2000.03: Occupation and Daily Life.

This is an introductory class on occupation for students enrolled in arts and science (particularly anthropology, economics, english, history, political science, psychology, sociology), commerce, and health professions (except for occupational therapy). Broadly speaking, occupation refers not only to our jobs, but to everything we do to look after and develop ourselves, be involved in meaningful endeavours, contribute to our communities, promote health, advocate for opportunities, generating income, and more. Students will be exposed to broad ranging literature on occupation. Assignments will involve reflection and problem solving to understand the individual development of occupation and the social organization of occupation in diverse cultures and societies, as well as the influence of various experiences and social conditions on the occupations which comprise everyday life.

INSTRUCTOR: TBA

FORMAT: 3 lecture hours

RESTRICTION: Not open to occupational therapy students

OCCU 2207.03: Occupational Development Across the Life Span.

Theories and processes that explain the complexity and dynamics of occupational development across the lifespan are introduced. Lifelong occupational transformation is characterized by typical patterns of physical, psychological, social and spiritual development across the life span yet occupational development is an individual process resulting from the dynamics of internal potentials and environmental challenges. Understanding the processes shaping occupational development such as occupational choice, occupational role development, development of adaptive patterns of occupational behaviour, and environmental dynamics is fundamental for the practice of occupational therapy.

INSTRUCTOR: TBA

FORMAT: Large and small group discussion, experiential learning and seminar presentations

PREREQUISITE: PSYO 1000.06, 1010.06 or 1500.06, SOSA 1000.06, 1050.06, 1100.06 or 1200.06

RESTRICTION: Occupational Therapy students only

OCCU 2208.03: Occupational Therapy: Theory and Process.

Students learn how occupation shapes and is shaped by human experience and the cultural, socio-political, and economic environments in which humans live. Taking this broad view of occupation, students learn the historical and theoretical foundations of occupational science and occupational therapy, emphasizing at this introductory stage the most prevalent, contemporary beliefs, values, concepts, models, frames of reference, and scope of practice. Knowledge about occupation is integrated with educational, psychological, and social theories about enabling people of all ages, regardless of (dis)ability, aging, or social disadvantage, to identify, choose, and engage in meaningful occupations in the socio-cultural-physical-political contexts of everyday life. The educational, psychological, and social theories of enabling people to learn through doing are related to various forms of client-centred practice. Scenarios and presentations will provide a basis for critical analysis

and problem solving to create visions of present and future occupational therapy practice. This class is linked closely to OCCU 2218.04, Introduction to Professional Practice.

INSTRUCTOR: E. Townsend

FORMAT: Large and small group discussions, self-directed and experiential learning

PREREQUISITE: SOSA 1000.06, 1050.06, 1100.06 or 1200.06, PSYO 1000.06, 1010.06 or 1500.06

RESTRICTION: Occupational Therapy students only

CO-REQUISITE: OCCU 2218.04

OCCU 2210.02: 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.

INSTRUCTOR: K. Mendez

FORMAT: Lecture/lab 2 hours

CO-REQUISITE: ANAT 2170.06

RESTRICTION: Occupational Therapy students only

OCCU 2213.03: Occupations - Analysis, Therapeutic Selection and Adaptation.

The medium of occupational therapy intervention is occupation, defined in its broadest concept. The role of occupation in accomplishing life tasks, satisfying physical and emotional needs, restoring physical and mental occupational health, and changing communities is explored. Through independent learning modules and directed laboratory experience, students analyze a range of occupations. Analysis of the physical, cognitive, perceptual, psychosocial, and environmental demands of an occupation are related to the therapeutic selection and adaptation of occupation to meet client defined goals.

INSTRUCTOR: Staff

FORMAT: Lecture/lab 4 hours

PREREQUISITE: OCCU 2208.03

CO-REQUISITE: OCCU 2210.02, ANAT 2170.06

RESTRICTION: Occupational Therapy students only

OCCU 2215.03: Client-Centred Occupational Assessment.

This class introduces student occupational therapists to fundamental concepts, processes, and strategies in client-centred occupational assessment. The focus is on embedding occupational therapy theory in the assessment stage of practice. Students learn to collaborate in the assessment of occupations with clients who may be individuals, groups, agencies, or businesses. They learn to integrate qualitative, quantitative and critical assessment data into occupational profiles of individuals or environments. Introductory knowledge and skill in client-centred occupational assessment are demonstrated through individual and group, experiential and written assignments which require initiative, resourcefulness, problem solving, reflective reasoning, critical analysis, and self-reflection.

INSTRUCTOR: E. Townsend

FORMAT: Problem-based seminars/labs/self-directed assignments 5 hours

PREREQUISITE: PSYO 1000.06, 1010.06, or 1500.06; SOSA 1000.06, 1050.06, 1100.06 or 1200.06; STAT 1060.03; OCCU 2207.03 and 2208.03

CO-REQUISITE: ANAT 2170.06 and 2100.03; PHYL 2030.06; OCCU 2210.02, 2213.03, 2218.04

RESTRICTION: Occupational Therapy students only

OCCU 2218.04: 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 and linked to OCCU 2208.03. Both dyadic and group therapeutic interaction are examined using communication skills in a variety of professional relationships. Other 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.

INSTRUCTOR: TBA

FORMAT: Seminar/practical

CO-REQUISITE: OCCU 2207.03, 2208.03

RESTRICTION: Occupational Therapy students only

OCCU 2222.00: Fieldwork I.

This initial six-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 a preceptor, students begin to observe and learn professional skills and patterns of behaviour. They practice specific knowledge application and skills with clients in harmony with the stated fieldwork learning objectives.

CO-REQUISITE: All other prescribed second-year classes except STAT 1060.03

RESTRICTION: Occupational Therapy students only

OCCU 3307.04: Therapeutic Procedures - Psychosocial.

The purpose of this class is to increase students' understanding of the psychosocial adaptation problems experienced by persons with occupational dysfunction. Occupational functioning problems of persons with mental, physical, and/or developmental disabilities, as well as those in difficult or stressful life situations, will be addressed. Students will be provided with the opportunity to develop their abilities to apply conceptual models of practice and theoretical concepts to psychosocial occupational therapy practice. The ability to determine the psychosocial needs of individuals and to apply techniques and strategies to restore, maintain, develop, and promote their occupational function and to prevent occupational dysfunction will be emphasized.

INSTRUCTOR: TBA

FORMAT: Lecture/lab 3 hours

PREREQUISITES: OCCU 2207.03, 2208.03, 2218.04, 2213.03, 2215.03

CO-REQUISITE: OCCU 3333.06

RESTRICTION: Occupational Therapy students only

OCCU 3308.03: Therapeutic Procedures - Neurodevelopmental.

Sensory-motor and motor learning frames of reference addressing remediation of occupational dysfunction resulting from neurological damage are discussed. Some of the current theorists associated with these frames of reference are Ayres, Bobath, Brunnstrom, Rood and Carr & Shepherd. The cognitive and perceptual models of practice are also presented and discussed with inclusion of both remediation and rehabilitation frames of reference for occupational therapy intervention.

INSTRUCTOR: E. Smits

FORMAT: Lecture 3 hours

PREREQUISITES: ANAT 2170.06, 2100.03; PHYL 2030.06; OCCU 2207.03, 2208.03, 2218.04, 2213.03, 2215.03

CO-REQUISITES: PHYL 3110.03, OCCU 3333.06

RESTRICTION: Occupational Therapy students only

OCCU 3311.04: 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.

FORMAT: Lecture/lab 6 hours

PREREQUISITES: ANAT 2170.06; PHYL 2030.06; OCCU 2208.03, 2210.02, 2213.03, 2215.03, 2218.04

CO-REQUISITES: OCCU 3333.06, 3350.03, 3360.03

RESTRICTION: Occupational Therapy students only

OCCU 3318.04: Professional Practice.

This class expands on the professional skills studied in OCCU 2218.04 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.

INSTRUCTOR: A. Unruh

FORMAT: Lecture/practical 2 hours

PREREQUISITES: All second-year classes

CO-REQUISITES: All third-year classes except OCCU 3322.00

RESTRICTION: Occupational Therapy students only

OCCU 3322.00: Fieldwork II.

During this ten-week field experience in the Atlantic Region students continue to develop skills and patterns of behaviour and begin to acquire competence in the role of occupational therapist through modelling on the behaviours of their preceptor. They also gradually develop their professional reasoning skills in the context of client-centered problem solving with on-going coaching and monitoring by the preceptor. Students assume partial responsibility for gradually increasing case loads thus gaining experience in applying therapeutic principles to occupational problems. Students also complete a community occupational therapy project that enables them to explore the community beyond the practice setting.

CO-REQUISITES: All third-year classes except elective

RESTRICTION: Occupational Therapy students only

OCCU 3333.06: Threats to Occupational Function.

(OCCU 3333.06 replaces OCCU 3302.05 and OCCU 3330.04) This class uses a variety of information sources and strategies to help students learn how to acquire knowledge about threats to occupational function that they are likely to encounter in the practice of occupational therapy. These threats include medical conditions, disease processes, mental illnesses, developmental disorders, and sociocultural influences. Pathologists introduce students to general pathological processes underlying some of these threats. Health professionals from different specialty fields introduce students to their roles in working with people whose occupational function has been affected by these threats. People who are living with threats to occupational function share their experiences. Students also develop information searching skills for learning about threats to occupational function through published information and apply this knowledge to their growing understanding of occupational therapy. Through this class, students learn to use a variety of strategies to update their knowledge of threats to occupational function throughout their professional careers.

INSTRUCTORS: Staff

FORMAT: Lecture/Seminar/Independent Study

PREREQUISITES: ANAT 2170.06, 2100.03; PHYL 2030.06, PSYO

1000.06, 1010.06 OR 1500.06; OCCU 2207.03, OCCU 2210.02

CO-REQUISITES: PHYL 3110.03; OCCU 3350.03, 3360.03

RESTRICTION: Occupational Therapy students only

OCCU 3350.03: 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 occupational function. Graduated work conditioning programmes are discussed. Biofeedback is presented as an adjunct to therapeutic programmes.

INSTRUCTOR: TBA

FORMAT: Lecture/lab 4 hours

PREREQUISITES: ANAT 2170.06; PHYL 2030.06; OCCU 2207.03,

2208.03, 2210.02, 2213.03, 2215.03, 2218.04

CO-REQUISITE: OCCU 3333.06

RESTRICTION: Occupational Therapy students only

OCCU 3360.03: 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 occupational assessment, vocational and pre-vocational testing and environmental accessibility evaluation. The principle of adaptation applied to occupational performance, equipment, and environment is integrated with the problem solving approach in planning programmes to achieve maximum occupational function at home, at work, at school, and in the community.

INSTRUCTOR: TBA

FORMAT: Lecture/lab 4 hours

PREREQUISITES: ANAT 2170.06; PHYL 2030.06; OCCU 2207.03,

2208.03, 2210.02, 2213.03, 2215.03, 2218.04

CO-REQUISITES: OCCU 3333.06

RESTRICTION: Occupational Therapy students

OCCU 3370.02: Integration Tutorials and Seminars.

The principles of problem based learning are used to facilitate students' ability to integrate and apply academic learning in preparation for their fieldwork experience. This class will require students to apply knowledge from prerequisite and corequisite classes to a variety of client scenarios and volunteer clients who are representative of occupational therapy practice. New knowledge/content will be acquired by students through self-directed learning in the context of client scenarios.

INSTRUCTORS: E. Smits, staff

FORMAT: Tutorials/Seminars, Self-directed learning

PREREQUISITES: All second year classes

CO-REQUISITES: All third year classes except for electives

RESTRICTION: Occupational Therapy students only

OCCU 4400.01: 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.

INSTRUCTOR: Staff

FORMAT: Lecture 1 hour

PREREQUISITES: PHYL 3110.03; OCCU 3333.06

RESTRICTION: Occupational Therapy students only

OCCU 4404.03: Occupational Therapy Programme Design and Evaluation.

The process of how to design remediation, maintenance, promotion and prevention programmes 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 programme. Strategies that one might utilize to enhance the process of developing and implementing programmes are identified. In order to ensure that programmes meet the needs of the target population, students determine how to develop evaluation protocols that will measure the process, impact and outcome of programmes.

INSTRUCTOR: TBA

FORMAT: Lecture/lab 3 hours

PREREQUISITES: All third-year classes

RESTRICTION: Occupational Therapy students only

OCCU 4407.03: Scientific Inquiry In Occupational Therapy.

Basic research methodology and its application to occupational therapy practice are discussed. Emphasis is on understanding the components of the research process in experimental/quantitative and naturalistic/qualitative research. Critical analysis of the literature is also included.

INSTRUCTOR: A. Unruh

FORMAT: Lecture 3 hours

PREREQUISITES: OCCU 3322.00, STAT 1060.03

RESTRICTION: Occupational Therapy students only

OCCU 4412.03: Advanced Neurotherapeutics in Occupational Therapy.

Self-directed learning is fostered to enable students to integrate neurophysiological, biomechanical, and motor learning principles with occupational therapy interventions for clients with neurological disorders. Laboratory classes are integrated to enhance learning, for example how to handle and position clients and the basics of making inhibitive casts.

INSTRUCTOR: E. Smits

PREREQUISITES: ANAT 2100.03; PHYL 3110.03; OCCU 3308.03 and 3322.00

RESTRICTION: Occupational Therapy students only

OCCU 4416.03: 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.

INSTRUCTOR: Staff

PREREQUISITES: OCCU 3350.03, 3360.03, 3322.00

RESTRICTION: Occupational Therapy students only

OCCU 4419.06: Advanced Professional Practice.

This class is designed to develop the leadership potential of student occupational therapists so that they are proactive practitioners in occupational therapy and society. Specifically, students are challenged to develop analyses and action strategies for shaping institutional and community environments. The emphasis is on creating therapeutic and living environments which enable people to identify and develop meaningful patterns of occupation despite disability, difficult life transitions, or social disadvantages. Building particularly on OCCU 2218.04, 2222.00, 3318.04, and 3322.00 (class and field experience/ knowledge) students will explore their leadership potential in occupational therapy as resource persons, advocates, policy and programme developers, educators, consultants and community developers. To promote leadership, the class emphasizes problem-based and experimental learning.

INSTRUCTOR: TBA

FORMAT: Lecture/project 4 hours

PREREQUISITES: All third-year classes

RESTRICTION: Occupational Therapy students only

OCCU 4420.00: Fieldwork III.

Eight weeks are spent in practice under professional direction outside the Atlantic region. Students develop competence in applying theoretical knowledge and clinical skills to identification and definition of client problems, planning and conducting programmes and measuring goal attainment. Under supervision, students assume responsibility for a case load 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.

PREREQUISITE: OCCU 3322.00

RESTRICTION: Occupational Therapy students only

OCCU 4421.06: 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 are required.

INSTRUCTOR: S. Banks

PREREQUISITES: STAT 1060.03, all third-year classes

CO-REQUISITES: OCCU 4404.03, 4407.03, 4419.06

RESTRICTION: Occupational Therapy students only

OCCU 4425.03/4426.03/4427.03: Directed Study in Occupational Therapy.

These classes offer students an opportunity to explore topics of particular interest and relevance for occupational therapy practice that are beyond required curriculum content. Topics offered in any given year reflect the resources and expertise available. Enrolment is limited to enhance opportunities for independent and experiential learning. An outline of the class goal, objectives and evaluation methods 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.

INSTRUCTOR: Staff

PREREQUISITE: Permission of Committee on Studies

RESTRICTION: Occupational Therapy students only

PHYL 2030.06: Human Physiology.

See class description in the Physiology and Biophysics section of this calendar.

PHYL 3110.03: Neurophysiology.

See class description in the Physiology and Biophysics section of this calendar.

STAT 1060.03: Introductory Statistics for Science and Health Science.

See class description in Statistics section of this calendar.

Oceanography

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Bowen, A.J. (494-3557)

Undergraduate Advisor

Ruddick, B.R. (494-2505)

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Professors

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Bowen, A.J., MA (Cantab), PhD (Scripps), FRSC
Boyd, C.M., MA (Ind), PhD (Scripps)
Chylek, P., Diploma (Charles), PhD (Calif) (NSERC/AES Research
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Cullen, J., AB (Calif), PhD (Scripps) (NSERC/Satatlantic Research
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Mills, E.L., BSc (Carl), MS, PhD (Yale), FLS
Moore, R.M., BA (Oxon), PhD (Southampton)
Ruddick, B.R., BSc (UVic), PhD (MIT)

Associate Professors

Boudreau, B.P., BSc (UNB), PhD (Yale)
Taggart, C.T., BSc (Carleton), MSc (York), PhD (McG)
Thompson, K.R., BSc, MSc (UManc), PhD (Liv) (jointly with
Mathematics, Statistics and Computing Science)

Associate Professor (Research)

Johnson, B.D., BEng (NC State), MEng (TUNS), PhD (Dal)

Assistant Professors

Folkins, I., BSc (Dal), MSc, PhD (Tor) (NSERC/AES Research Chair),
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Fu, Q., MSc (Peking), PhD (Utah) (NSERC/AES Research Chair),
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Hill, P.S., AB (Dartmouth), MSc, PhD (Wash)
Kelley, D., BSc (Mt A), PhD (Dal) (NSERC University Research
Fellow)
Lohmann, U., MSc, PhD (Hamburg)
Miller, W., BA (Wake Forest), MSc (S. Florida), PhD (URI)

Honorary Adjunct Professors

Barker, H., BSc (Tor), MSc, PhD (McMaster)
Bricelj, M., MSc (Buenos Aires), PhD (SUNY)

Cembella, A., BSc (Simon Fraser), PhD (UBC)
Craigie, J.S., BA, MA, PhD (Queen's)
Frank, K.T., BSc, PhD (Toledo)
Hargrave, B.T., BSc, MSc (Dal), PhD (UBC)
Isaac, G., BSc, MSc, PhD (McG)
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Curie)
Smith, J.N., BSc (McG), MSc (Chicago), PhD (Tor)
Smith, P.C., BSc, MS (Brown), PhD (MIT/WHOI)
Wangersky, P.J., BSc (Brown), PhD (Yale)
Wright, D., BSc (Laurentian), PhD (UBC)

I. 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 crystal 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.

II. Classes Offered

OCEA 2850.06: 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 this ecological system. Designed to give a background or 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

RESTRICTION: Second year students only, or more advanced students

OCEA 2851.03/2852.03: Introduction to Oceanography.

These classes will cover topics already described under OCEA 2850.06 and are only open to Marine Biology Co-Op students that are unable to take OCEA 2850.06 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 prerequisites are the same as for OCEA 2850.06.

OCEA 3000.03: The Atmosphere.

The purpose of this class is to provide understanding of the basic physical and chemical processes determining the evolution, behaviour and anthropogenic modification of the atmosphere. Topics include: (a) formation and evolution of the atmosphere, chemical composition, recent anthropogenic changes, greenhouse gases, stratospheric ozone; (b) atmospheric motions, mesoscale and large scale dynamics, general circulation, numerical weather prediction and general circulation models; (c) solar radiation as a source of atmospheric motions, terrestrial radiation, energy balance, scattering and absorption of radiation in the atmosphere, elements of radiative transfer; (d) hydrological cycle, thermodynamics of water vapor, phase transitions, role of aerosols and clouds, precipitation; and (e) climate models, past climate, global change, anthropogenic effects.

INSTRUCTOR: I. Folkins

PREREQUISITES: MATH 1000.03/1010.03 or equivalent and PHYC 1000.06 or 1100.06 or equivalent

CROSS-LISTING: PHYC 2700.03B

OCEA 3170.03: Physics and Chemistry of the Ocean.

This class outlines concepts in physical and chemical oceanography with special emphasis on the ocean's role in the global biogeochemical and physical/climate systems. This class is in two parts. In the first part, topics include: the oceans as a physical system, water properties, basic dynamical concepts, the forces creating oceanic motion, ocean circulation, shelf and coastal processes. In the second part topics include: the oceans as a chemical system, composition of sea water, control of pH and redox potential, nutrient chemistry, trace elements, organic materials, distributions and geochemical cycles.

INSTRUCTORS: D. Kelley, W. Miller

FORMAT: Lecture 3 hours

PREREQUISITES: MATH 1000.03/1010.03, plus first-year chemistry, or equivalent or permission of the instructor

RESTRICTION: Third and fourth-year students only

OCEA 3420.03: Geochemistry of Aquatic Environments.

Given the abundance of water at the earth's surface and the wide use both humans and other organisms make of aqueous environments, it becomes imperative for environmentally-oriented scientists to understand the chemistry of natural bodies of water. In particular, we need to comprehend the processes that lead to the observed composition of groundwaters, lakes, rivers and oceans. We also need to be aware of how man's activities can alter these natural systems. Water is also an agent for geologic and environmental change, both on short and long time-scales. Earth and environmental scientists should have an appreciation of these processes (sources, sinks and transport mechanisms) and the resulting geological cycles. This class is an introduction to the governing principles and processes of aquatic geochemistry. Specific topics will include physical chemistry of natural waters, kinetics (mechanisms & rates) of geochemical reactions, the hydrologic cycle, the dissolved carbonate system and pH controls, redox reactions and the influence of life, rainwater and acid rain, weathering and the formation of soils, mineral-solution equilibria, controls on the composition of rivers, lakes and oceans, sediments and their after-burial changes, and the global cycles of carbon, nitrogen, and sulfur. Students will be taught to approach problems quantitatively through the principles of mass action (Eh-pH and activity-activity diagrams) and of mass balance (box models and conservation equations).

INSTRUCTOR: B. Boudreau

FORMAT: Lecture 3 hours

PREREQUISITES: CHEM 1011.03/1012.03 or equivalent and EARTH 1000.06

CROSS-LISTING: EARTH 3420.03

OCEA 4110.03: Introduction to Geological Oceanography.

This class is intended to give a broad survey of topics in marine geology and geophysics for new students in Oceanography at a graduate level. No previous background in Geology or Geophysics

is required. The class content covers recent methods and observations with quantitative applications to an understanding of geophysical and geological processes. Some topics covered in Part 1 are plate tectonics and seismic, heat flow, gravity, and magnetic methods. In Part 2 patterns and processes of sediment transport and deposition are explored. Some laboratory exercises augment the lectures, including a field cruise to Bedford Basin.

INSTRUCTOR: P. Hill, K. Loudon

FORMAT: Lecture 3 hours

PREREQUISITE: Instructor's consent

CROSS-LISTING: OCEA 5110.03

OCEA 4120.03: Introductory Physical Oceanography.

This class explores 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, 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. This class takes a quantitative approach in which equations describing the fluid motions and phenomena are derived, analyzed, and discussed. Quantitative problem-solving is emphasized in assignments. Those desiring a more qualitative approach are urged to consider OCEA 3170.03.

INSTRUCTOR: B. Ruddick

FORMAT: Lecture 3 hours

PREREQUISITE: MATH 1000.03, MATH 1010.03, classic calculus or equivalent, and permission of the instructor

RESTRICTION: Third- and fourth-year students only

CROSS-LISTING: OCEA 5120.03

OCEA 4130.03: Introductory Chemical Oceanography.

This class covers the major and minor constituents of sea water, the controls on its chemical composition, nutrient cycling, gas exchange and the influence of the oceans on atmospheric chemistry. 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

PREREQUISITE: Instructor's consent

CROSS-LISTING: OCEA 5130.03

OCEA 4150.03: Principles of 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.

INSTRUCTOR: TBA

FORMAT: Lecture 2 hours, lab 1+ hours

PREREQUISITES: BIOL 2060.03 or equivalent and instructor's consent

CROSS-LISTING: BIOL 4660.03

OCEA 4160.03: Fisheries Oceanography.

Students who are not competent with fundamental population dynamics, ecology, physical oceanography, calculus, statistics, and computerized analysis should not enroll. The class focuses on the ecology of marine fish (including significant advances made in freshwater systems) and on the biotic and abiotic influences on marine fish population dynamics and production, distribution and abundance. Lectures include reproduction, early life history, feeding, growth, metabolism, mortality, and recruitment variability and forecasting. Emphasis is placed on: 1) hydrological and meteorological processes influencing the above and on 2) the primary literature, current problems and hypotheses, and fruitful research directions, approaches and techniques. Some emphasis is

also placed on the application of scientific insights to fishery management techniques. Students are required to write a primary publication-style research paper.

INSTRUCTOR: C.T. Taggart

FORMAT: Lecture 3 hours, some practicums/tutorials

PREREQUISITES: OCEA 2850.06 or 2851.03 or 2852.03, BIOL 2060.03 and/or 3067.03 or equivalent. MATH/STAT 1060.03 and/or 2080.03 or equivalent or instructor's consent.

CROSS-LISTING: BIOL 4369.03B, OCEA 5160.03

***OCEA 4210.03: Time Series Analysis in Oceanography.**

Time series analysis in both the time and frequency domain is introduced. The class is applied and students are required to develop their own computer programmes 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.

INSTRUCTOR: K. Thompson

FORMAT: Lecture 3 hours

PREREQUISITE: Instructor's consent

CROSS-LISTING: STAT 4390.03/5390.03, OCEA 5210.03

***OCEA 4230.03: 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: M. Lewis

FORMAT: Lecture 3 hours, some labs

PREREQUISITE: Instructor's consent

CROSS-LISTING: BIOL 4662.03, OCEA 5230.03

OCEA 4250.03: Introductory Acoustical Oceanography.

This class is intended to provide an Introduction to Acoustical Oceanography for students at the senior undergraduate and graduate levels, and for the non-specialist in ocean studies.

The class covers the basic theory of sound propagation and scattering in the ocean environment, and the applications to acoustic remote sensing of the ocean interior. The areas of application include: Physical oceanography, biological and fisheries oceanography, and marine geophysics and geology. The class is open to students with backgrounds in the life and environmental sciences, as well as in the physical sciences and engineering.

INSTRUCTOR: A. Hay

FORMAT: Lecture 3 hours

PREREQUISITES: MATH 2001.03 and 2002.03 or equivalent and instructor's consent

CROSS-LISTING: OCEA 5250.03

***OCEA 4311.03: Fluid Dynamics I.**

An introduction to the theory of fluid dynamics, with some emphasis on geophysically important aspects. Contents: tensor mathematics, flow kinematics, equations of motion, viscous flow, potential flow, convection, turbulence, and basic aerodynamics. Occasional reference will be made to current research topics, especially those in Physical Oceanography.

INSTRUCTOR: D. Kelley

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 4311.03, PHYC 5311.03, OCEA 5311.03

***OCEA 4330.03: Benthic Ecology.**

An advanced level graduate class concentrating on the major problems 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 geomicrobiological processes in the sediments. The class is heavily oriented to the

current literature. Classes consist of two lectures per week and one journal paper discussion session. The last three weeks of the class are devoted to a class research project. Students are required to have a background in ecology, statistics and invertebrate zoology.

INSTRUCTOR: J. Grant

FORMAT: Lecture 3 hours

PREREQUISITE: Instructor's consent

CROSS-LISTING: BIOL 4666.03, OCEA 5330.03

***OCEA 4331.03: History of Marine Sciences.**

This class describes the development of the marine sciences from biological, chemical, physical and geological knowledge going back to the 17th century or earlier. It includes the important voyages of exploration, the development of marine biology, ocean circulation and plate tectonics, also the importance of technological changes upon marine science.

INSTRUCTOR: E.L. Mills

FORMAT: Lecture 3 hours

PREREQUISITE: Instructor's consent

CROSS-LISTING: BIOL 4664.03, OCEA 5331.03, SCIE 4001.03

***OCEA 4380.03: 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.

INSTRUCTOR: M. Lewis

FORMAT: Lecture 3 hours

PREREQUISITES: OCEA 4120.03, MATH 4220.03 and Instructor's consent

CROSS-LISTING: OCEA 5380.03

***OCEA 4411.03: 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: Q. Fu

FORMAT: Lecture 3 hours

PREREQUISITE: Instructor's consent

CROSS-LISTING: PHYC 4411.03/5411.03, OCEA 5411.03

***OCEA 4412.03: Dynamic Meteorology II.**

The approach is the same as for 4411.03, 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: Q. Fu/H. Ritchie

FORMAT: Lecture 3 hours

PREREQUISITE: PHYC/OCEA 4411.03 or instructor's consent

CROSS-LISTING: PHYC 4412.03/5412.03, OCEA 5412.03

***OCEA 4500.03: Atmospheric Physics I.**

See class description for PHYC 4500.03 in the Physics section of this calendar.

***OCEA 4510.03: Atmospheric Physics II.**

See class description for PHYC 4510.03 in the Physics section of this calendar.

***OCEA 4515.03: 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: Staff

CROSS-LISTING: PHYC 4515.03

OCEA 4520.03: Introduction to Meteorology.

See class description for PHYC 4520.03 in the Physics section of this calendar.

***OCEA 4530.03: 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 atmospheric general circulation, radiative transfer, atmosphere-ocean-biosphere interaction, and climate change.

INSTRUCTOR: P. Chylek/Q. Fu

FORMAT: Lecture 3 hours

PREREQUISITE: Instructor's consent

CROSS-LISTING: PHYC 4530.03/5530.03, OCEA 5530.03

***OCEA 4541.03: Synoptic Meteorology I.**

See class description for PHYC 4540.03 in the Physics section of this calendar.

***OCEA 4550.03: Synoptic Meteorology II.**

See class description for PHYC 4550.03 in the Physics section of this calendar.

OCEA 4595.03: Atmospheric Chemistry.

This class will discuss the reactions that govern the distribution of chemical species in the troposphere and stratosphere. It will include such topics as the ozone layer and the reasons for its depletion over Antarctica, the formation of acid rain, and photochemical smog. It is desirable for students taking this class to have taken "Introduction to Meteorology", or have some other previous exposure to Atmospheric Science.

INSTRUCTOR: I. Folkins

FORMAT: Lecture 3 hours

PREREQUISITE: OCEA 4520.03 and Instructor's consent

CROSS-LISTING: OCEA 5595.03

OCEA 4600.03: 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 Maritime as well as non-local fisheries.

Class structure will be a mixture of lecture and class discussions, supplemented by visits to aquaculture sites. Class requirements will include a research paper and oral presentations.

INSTRUCTORS: J. Grant, G. Newkirk

FORMAT: Lecture/discussion 3 hours

PREREQUISITES: BIOL 2001.03, 2060.03, and 3321.06; fundamental knowledge of statistics; permission of instructor

CROSS-LISTING: BIOL 4600.03/5600.03, OCEA 5600.03

SCIE 3000.06: Science Fundamentals.

See class description in Science, Interdisciplinary section of this calendar.

Pharmacology

Location: Sir Charles Tupper Medical Building
Sixth Floor
Halifax, NS B3H 3H7
Telephone: (902) 494-3435
Fax: (902) 494-1388

Dean

McIntyre, L., MD, MHSc, FRCP(C)

Professor and Head of Department

Robertson, H.A., BA, MSc (Western), PhD (Cantab)

Professors

Downie, J.W., BSc, PhD (Manitoba)
Ferrier, G.R., BSc, PhD (Manitoba)
Gray, J.D., BSc, MD (Alta), FRCP(C), Medicine
Ranton, K.W., BSc (Sir Geo Wms), PhD (McG)
Sawynok, J., BSc, MSc (Melb), PhD (Queen's)
Vohra, M.M., BPhm, MPhm, PhD (Ban)
White, T.D., BSc, MSc (Western), PhD (Bristol), Graduate Studies
Coordinator

Associate Professors

Blay, J., BSc (Brad), PhD (Cantab)
Howlett, S.E., BSc (Concordia), MSc, PhD (Memorial)
Kelly, M.E.M., BSc, PhD (Southampton)
McKenzie, G.M., BSc (Windsor), MSc, PhD (Dal)

Cross Appointments

Hall, R.I., BSc Pharm, MD (Dal), FRCP(C), FCC, Major Appointment
in Department of Anesthesia
Hong, M., BSc, MSc, PhD (Queen's), Major Appointment in
Department of Neurosurgery
Hung, O.R., BSc Pharm, MD (Dal) FRCP(C), Major Appointment in
Department of Anesthesia
Kopala, L.C., BSc (Alberta), MD (U of Calgary), Major Appointment
in Department of Psychiatry
Peterson, T.C., BSc (SMU), MSc, PhD (Dal), Major Appointment in
Department of Medicine
Ruedy, J., MDCM (Queens), FRCP(C), Major Appointment Dean
Faculty of Medicine at Dalhousie
Rusak, B., BA (Toronto), PhD (Berkeley), Major Appointment in
Department of Psychiatry

Adjunct Appointments

Marshall, W., BSc (Acadia), PhD (UBC), Major Appointment in
Department of Biology at St. FX University
Cribb, A.E., DVM (Saskatchewan), PhD (Toronto), Major
Appointment in Department of Anatomy / Physiology at UPEI

Post-Doctoral Fellows and Research Associates/Assistants 1997

Braker-Klassen, M., BSc, PhD (USask)
Bujas, M., MSc, MD (University of Zagreb, Croatia)
Denovan-Wright, E., BSc, PhD (Dal)
Dui, H., PhD (University of Beijing, China)
Kelly, M.E., BA (Western), MSc, PhD (Carleton)
Zhu, J., PhD (Tongji University, China)

I. Introduction

The Department of Pharmacology offers a range of undergraduate and graduate classes in addition to those restricted to students in the Faculties of Medicine, Dentistry and Health Professions. The Department of Pharmacology does not offer a specific Bachelor's degree programme (see the Graduate Studies Calendar for details on the Master and Doctorate degree programmes).

Although the Department of Pharmacology does not offer an honours programme as such, it is possible for students in Biochemistry and/or Microbiology or other honours programmes to carry out their honours thesis project in Pharmacology. For further details contact the Department.

The classes listed below are designed to provide the student with an understanding of how chemicals interact with living systems. A knowledge of pharmacology is therefore of interest not only to those in the health professions but also to those interested in Chemistry, Leisure studies, Law and Environmental Studies to name but a few.

Pharmacology is the interactions of chemicals with biological systems and thus students who take pharmacology classes should have a background in both chemistry (and preferably biochemistry), biology and physiology. However, students from a wide variety of backgrounds have been successful in pharmacology classes.

Biology 4404.03 is an introductory class for those interested in a general overview of the subject of pharmacology. Admission to this class is by permission of the coordinator but a good background in physiology and biochemistry is important.

II. Classes Offered For Health Professions Students

Students in the Occupational Therapy programme receive a class of lectures designated OCCU 4400.03. Students in Nursing receive instruction in systematic pharmacology designated as NURS 2050.03.

NOTE: Students in the Faculty of Arts and Social Sciences or the Faculty of Science must attain permission from the Faculty to enrol in Pharmacology classes. This permission must be in writing, and be presented to the Registrar's Office upon registration for the classes.

BIOL 4404.03: 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 various body systems will be covered, including the central and peripheral nervous systems, the cardiovascular system and the immune system. Drugs that assist or regulate host defence mechanisms will also be studied. 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.

COORDINATOR: J. Blay

FORMAT: Lecture 3 hours

CO-REQUISITE/PREREQUISITE: Upper level physiology or instructor's consent

CROSS-LISTING: PHAC 5406.03, BIOC 4804.03, NESC 4374.03

BIOL 4405.03: Introduction to Pharmacology II.

This class is intended to cover specific aspects of drug action in greater depth than BIOL 4404.03 and to provide students with practical experience in pharmacology and a perspective on pharmacological research. The laboratory component consists of practical exercises using various techniques, as well as computer simulations. The practicalities of drug marketing are briefly considered. Instructor's consent and signature are required.

COORDINATOR: J. Blay

FORMAT: Lecture 1 hour, laboratory 3 hours

PREREQUISITE: BIOL 4404.03 and instructor's consent

CROSS-LISTING: PHAC 5407.03, BIOC 4805.03, NESC 4375.03

Pharmacy

College of Pharmacy

Location: George A. Burbidge Building
5968 College Street
Halifax, NS B3H 3J5
Telephone: (902) 494-2378
Fax: (902) 494-1396

Dean

McIntyre, L., MD, MHSc, FRCP(C)

Academic Staff, 1998-99

Director and Professor

Chandler, R.F., BSc Pharm, MSc (Alta), PhD (Syd)

Professors Emeriti

Duff, J.G., BSP, MSc (Sask), PhD (Fla)

Professors

Chandler, R.F., BSc (Pharm), MSc (Alta), PhD (Syd), Director and Professor

Sketris, I.S., BSc(Pharm) (Tor), PharmD (Minn), MPA (HSA) (Dal)

Yeung, P.K.F., BSc (Pharm), MSc (Man), PhD (Sask)

Yung, D.K., BA, BSP, MSc (Sask), PhD (Alta)

Associate Professors

Abraham, I., BPharm, MPharm (UST Ksi), PhD (Neb)

Farmer, P.S., BSP, MSc (Sask), PhD (Portsmouth)

MacCara, M.E., BSc (Pharm) (Dal), PharmD (Minn)

Whelan, A.M., BSc (Pharm) (Dal), PharmD (MUSC)

Assistant Professors

Gardner, D., BSc (Pharm), PharmD (UBC)

Jurgens, T., BSc (Pharm), MSc (Dal), PhD (Minn)

MacLaren, R., BSc (Pharm), PharmD (UT)

Mansour, S.A., BSc (Pharm), MBA (Dal), PhC

Pearson, G., BSc (Biol) (ON), BSc (Pharm), PharmD, (Penn)

Wilson, J., BSc (Pharm)(Dal), PharmD (SC)

Externship Administrator

Wentzell, N., BSc (Pharm) (Dal), PhC

Co-Ordinator, Community Experience Programme

Harris, N., BSc (Pharm) (Dal)

Sessional Lecturers

Ferguson, S., BSc (Pharm) (Dal)

Frail, D., BSc (Pharm), MSc (Pharm), (Dal)

Kirumira, A.K., BSc Hons (Mosul, Iraq), MSc Distinction (Reading, PhD) (Murdock)

King, J.P., BEd (UPEI), MBA (Dal)

McCarthy, D.

Stanciu, I., MSc (Chem) (Romania)

Wentzell N., BSc (Pharm) (Dal), PhC

Joint Appointment

Foy, E.A., Professional Information Officer, College of Pharmacy,
Pharmacy Subject Specialist and Information Officer, WK
Kellogg Health Sciences Library.

Adjunct Appointments

Jones, D.W., BSc, PhD (Birm), FICeram, CChem, FRSC(UK), FADM;

Honorary Professor, College of Pharmacy; Professor and Head,
Division of Dental Biomaterials Science, Faculty of Dentistry

Kirumira, A.K., BSc, MSc, PhD (Australia), Honorary Adjunct
Professor, College of Pharmacy; President Octopus Diagnostics,
Inc.

Pollock, P.T., BSc, MD, PhD (Western), Staff Physician, Department
of Internal Medicine, Victoria General Hospital; Honorary
Assistant Professor, College of Pharmacy

Quilliam, M.A., BSc (Honors), PhD (Man); Adjunct Associate
Professor, College of Pharmacy; Associate Research Officer,
Atlantic Research Laboratory, NRC.

Slyater, K., BSc (Pharm), PharmD (NY)

Steeves, R., BSc (Pharm) (Dal), PharmD (Fla), PhC, Lecturer, College
of Pharmacy, Clinical Co-ordinator

Special Lecturers

Allison, N.	Ascroft, J.
Ashton, S.	Belliveau, B.
Bennett, C.	Black, S.
Comeau, D.	Cook, C.
Creurer, I.	Dauphinee, K.
Gilbert, R.	Godin, J.
Grandy, L.	Hurley, T.
Kyte, A.	Lee, M.
Lummis, H.	MacDonald, N.
Mackenzie, S.	Manderville, J.R.
Meisner, J.	Mitchell, T.
O'Leary, D.	O'Malley, J.
Osborne, D.	Paton, T.
Pierce, S.	Robert, S.
Rojas-Fernandez, C.	Sadek, J.
Salsman, B.	Scott, A.
Shipp, K.	Smith, I.
Sponagle, K.	Steinburg, L.
Tanner, L.	Wang, Y.
Wheeler-Usher, D.	Wilson, B.
Zinck, T.	

Preceptors

Throughout the Maritime Provinces pharmacist preceptors in community and hospital pharmacies participate in a structured practical training programme and clinical clerkship. The College of Pharmacy would like to acknowledge the valuable and essential contribution the preceptors make to the education process, and sincerely thank them for the time and energy they devote to students.

The programme is administered by the College with the support of the Pharmacy Licensing Bodies in the Maritimes. Second and third year students demonstrate their knowledge and professional competency in actual practice situations in community and hospital pharmacy.

Clinical Associates

Pharmacists at the hospitals, medical centres and pharmacies listed below contribute their time and expertise to a Clinical Clerkship programme. The College of Pharmacy would like to thank these pharmacists for their contribution to the education process. During the Clerkship, students attend conferences and clinical drug rounds at participating hospitals and learn to apply clinical pharmacy principles.

Nova Scotia

- Canadian Forces Hospital (Stadacona)
- Cape Breton Regional Hospital
- Izaak Walton Killam Hospital For Children
- Lawton's Drugs
- Nova Scotia Hospital
- Northwood Clinical Pharmacy
- Queen Elizabeth II Health Sciences Centre
- Valley Regional Hospital

New Brunswick

- Dr. Everett Chalmers Hospital
- Edmunston Regional Hospital
- The Moncton Hospital
- Saint John Regional Hospital

Prince Edward Island

- Queen Elizabeth Hospital

I. 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 8 graduate students.

II. College of Pharmacy Mission Statement

Mission

Preparing pharmacists committed to enhancing health.

Vision

Dalhousie University College of Pharmacy is an innovative and leading institution which prepares competent practitioners and expands practical knowledge. The College provides undergraduate, practitioner and graduate curricula which continually evolves to meet the needs of the health care system.

The College strives to prepare a health professional who demonstrates commitment to the patient, society, and the profession. An outcomes-focused curriculum assists students in mastering the knowledge, skills and attitudes needed to ensure healthy outcomes for patients.

The College provides outcomes-focused curricula for pharmacy practitioners and graduate students. Through practice-based research the College promotes optimal drug therapy. These activities ensure that society benefits from practitioners responsive to the changing health needs.

The College nurtures a desire for lifelong learning, promotes an environment of collaboration among health professionals and develops professionalism, ethical behaviour, excellence and accountability to the patient, society and the profession.

III. College of Pharmacy Regulations (PBL Curriculum)

All students are required to observe the University Academic Regulations as described in this calendar. Students are referred to a separate document, Promotion/Evaluation Regulations, available at the College of Pharmacy. The academic performance of each student in the College is assessed by a Promotions Committee. To satisfy the requirements for the degree of Bachelor of Science in pharmacy, a student must achieve a grade of Pass in each prescribed unit.

IV. College of Pharmacy Regulations (Traditional Curriculum)

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.

A. Academic Requirements

1. A student must obtain a grade of at least C (C- or lower is not acceptable) in each class for that class to be counted as credit for the degree or as a prerequisite for another class. A student who earns a grade of less than C in any of these classes 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 prescribed 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 judgment of the faculty, fails to attain a satisfactory standard in the assessment may be retired from the College of Pharmacy.
8. Failure in Pharmacy 3000.00 (PTP) results in the student having to repeat the class at its next regular offering.

B. Externship Programmes

Students are required to complete the externship programmes (PHAR 3000.00, PHAR 2000.00 and PHAR 4511.03). These placements may be outside the Halifax/Dartmouth area. Students are responsible for any travel, accommodation and any other costs associated with the externship programmes.

C. Academic Regulations

Students will be governed by regulations found in the Academic Regulations section of this calendar.

Credit Hours

For traditional 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.

Requirements for Degree

- a) To satisfy the requirements for the degree of Bachelor of Science in Pharmacy students who entered the College of Pharmacy before 1997 must:
 - Accumulate at least 123 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 117 credit hours (or its equivalent for transfer students), with an overall (cumulative) GPA of at least 2.00 in all classes excluding non-science electives.

b) Students who entered the College of Pharmacy in or after September 1997 should contact the School.

D. 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.

E. Supplemental Examinations

A student who has met the yearly academic requirements but has a C- or a D in one professional class, and no failures, may, on the approval by Faculty Action of a recommendation by the Committee on Studies and at the discretion of the professor(s) in charge of the class, be allowed to raise the grade to an acceptable level by writing a supplemental examination.

When the class in question is a half-class held in the first-term and is a pre-requisite for a class scheduled for the second term, the student may explore the possibility of writing the supplemental examination before the end of January. Such a supplemental will be permitted only if all other first-term grades are C or better and the first-term (sessional) grade point average is 2.00 or higher.

Supplemental examinations will be subject to the following regulations:

1. Supplemental examinations will be allowed for not more than six credit hours of class work in a student's programme.
2. The College of Pharmacy is responsible for scheduling Supplemental examinations for Pharmacy classes. These examinations will be written at a time agreed to by the professor(s) of the class and the student. However, it is advised that this must be before February 1 (for A term classes) and before September 1 (for B and R term classes) immediately following the class. A student who opts to write the supplemental examination forfeits the right to appeal the first grade. Also, s/he is only provisionally enrolled in the subsequent class pending the results of the supplemental exam or the appeal.
3. On successful completion of a supplemental examination, the lowest passing grade (C) is entered on the student's record along with the notation that the C was earned by supplemental examination. In the case of a failure an F is entered. The recorded supplemental examination mark, will be used for grade point average calculations. However, the original grade of C- or D also remains on the transcript.
4. A student who fails to pass a supplemental examination can obtain credit for that class only by successfully repeating the class.
5. Supplemental examinations may not be deferred.

Students eligible to write supplemental examinations must submit to the office of the Director of the College a completed application form (obtained from that office). The College will charge a supplemental fee of \$50 directly to the student.

F. Leave of Absence from the College of Pharmacy

A student who needs to take leave from the pharmacy programme may apply to the Director to do so. A leave of absence will be limited to one leave period and will not normally exceed one academic year. A leave of absence will not count towards time in the Pharmacy programme.

Procedure

1. A leave of absence must be approved in advance by the Director of the College of Pharmacy. Normally, a student who absents himself/herself from the College of Pharmacy without prior permission for an extended period (four weeks or greater) will be presumed to have withdrawn and will have to re-apply for admission to the College of Pharmacy.

2. Following the approved absence from the College of Pharmacy, the Committee on Studies will determine the classes the student will be required to take on re-entry. Preferably, this will be decided upon at the time the leave of absence is granted, and the student will be so notified in writing.
3. The Director will inform the Registrar's Office, the College faculty and staff members, and other faculty members currently involved in teaching the student, of the leave of absence.
4. The student granted a leave of absence will inform the Director, in writing, by a predetermined date, of the intent to resume the study of pharmacy. If approved, the Director will inform the Registrar's Office and ask that the student returning from a leave of absence be sent the appropriate registration materials.

G. Appeals

Students who wish to raise the question or to register complaints about matters of academic appeal are advised to communicate informally with their instructor within 15 days of the alleged unfairness or irregularity. If no resolution arises from this (these) meeting(s), the student may initiate a formal appeal.

Students wishing to initiate a formal appeal should follow the appeals procedures as set out by the Faculty of Health Professions. These procedures are available within the library, College of Pharmacy. Application for a formal appeal should be made to the Chair, Committee on Studies within 30 days of the matter giving rise to the appeal.

H. Library

The Pharmacy Library, housed on the first floor of the Burbidge 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 150 serial subscriptions relating to pharmacy and allied sciences. In addition, there is access to several CD-Rom databases unique to the Pharmacy Library, and access to many others through the University Libraries' local area network (LAN).

I. Immunization

Students must show proof of current immunization against tetanus, diphtheria, polio, measles, and rubella.

Immunization against Hepatitis B is strongly recommended, before completion of hospital rotations. This is available through Dalhousie Health Services. Students must cover the cost of the immunization.

Evidence of tuberculin testing (Mantoux) is required before all hospital rotations. The College of Pharmacy will arrange for the University Health Services to administer the test.

J. 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 and marketing, 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 consultants, government inspectors and health 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.

K. 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, Burbank Complex, 101-30 Gordon Street, Moncton, N.B., E1C 1L8; the Registrar of the Prince Edward Island Pharmacy Board, PO Box 89, Crapaud, P.E.I., C0A 1T0; or the Registrar of the Nova Scotia Pharmaceutical Society, 1526 Dresden Row, PO Box 3363, Halifax South Postal Station, Halifax, NS, 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 Faculties of Pharmacy accredited by the Canadian Council for Accreditation of Pharmacy Programmes are eligible to write these examinations. Successful completion of these examinations is a prerequisite to licensure in Canada. Information relative to the dates of examinations, application forms, etc., may be obtained through the Director's Office, College of Pharmacy.

The Pharmacy Examining Board of Canada requires proof of language proficiency for all candidates for the Qualifying Examination. All applicants must be proficient in either English or French, both written and spoken.

Applicants for whom either English or French is the first language learned i.e. "mother tongue"; and/or primary and secondary education was wholly conducted in English or French will be required to sign a declaration on the Qualifying Examination application form attesting to this fact. Applicants who did not attend primary and secondary educational institutions where English or French was the principal language of instruction must provide evidence of successful completion of designated language proficiency tests before sitting for the Qualifying Examination.

L. 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.

V. Programmes Offered

The Bachelor of Science in Pharmacy programme has been awarded preliminary accreditation status for the period 1994-1999.

The College of Pharmacy offers a four-year programme, following at least one year of general science, leading to the degree of Bachelor of Science in Pharmacy - BSc(Pharm).

The undergraduate programme, which admits 66 students into the first professional year, has a patient-oriented curriculum integrating clinical pharmacy with the pharmaceutical sciences. The curriculum has been restructured to an integrated problem-based learning format, implemented in 1997. Students who entered the College before September 1997 will complete the programme with primarily traditional classes, although certain of the biomedical sciences will be delivered in the revised format.

The syllabus of Year 1 includes biomedical and physical sciences (anatomy, physiology, organic chemistry, biochemistry, microbiology, and pharmacology) in discrete three- to seven-week units. The pharmaceutical sciences (biopharmaceutics and pharmacokinetics, medicinal chemistry, drug metabolism, toxicology, pharmaceutics and physical pharmacy) with necessary reviews of biomedical content, are integrated in Years 2 through 4, with therapeutics, pharmacoepidemiology, pharmacoconomics, pharmaceutical care, communications, interprofessional relations, law and ethics, social and administrative pharmacy issues, and the role of pharmacy in the health care system.

The College participates with the Queen Elizabeth II Health Science Centre and the Moncton Hospital in providing a twelve-month Hospital Pharmacy Residency Programme. Through structured rotations in various areas of pharmacy practice, the programme aims to prepare pharmacists for exemplary pharmacy practice. Areas of rotations include patient care, drug information, drug distribution, pharmacy administration, a research project and inservices and education. The emphasis is on providing exemplary patient care. Practitioner role models/preceptors are utilized throughout the programme so the necessary skills, knowledge and values required to be a pharmacist can be acquired and applied by the resident. A stipend is provided and a certificate is presented to candidates successfully completing the programme.

There will be no new admission to the MSc and PhD programmes in Pharmacy for the next year. All graduate students currently enrolled in Masters and Doctoral programmes should refer to the current Graduate Studies calendar for programme regulations and class descriptions.

Curriculum Structure

Tutorials

The principal feature of the curriculum is problem-based learning (PBL). Students learn together in groups of eight or nine. Each first-year group is facilitated by a trained non(content)-expert tutor. Second, third and fourth year students are tutored by trained faculty, sessional tutors (practitioners) and senior students.

Two-hour tutorials are held three times a week. In tutorial sessions students are presented with a situation for which they must identify their own prior knowledge and set specific learning objectives. Students use the time between tutorial sessions for self-directed learning of the objectives that they have set. They then are responsible for ensuring that other group members learn these objectives.

Lectures

A minimal number of lectures explain difficult concepts and summarize learning modules. Science laboratory sessions are limited to experiments and demonstrations that enhance student learning of concepts.

Skills Laboratory

The skills laboratories help students develop skills such as compounding, sterile technique, use of devices such as glucose monitors and ostomy aids, computer skills, written and verbal communications and responding to drug information requests.

Clerkship*

A progressive professional and field experience complements the Ph.D. curriculum as follows:

Year 1

- the equivalent of one day service per week in nonpharmacy, health-oriented community service such as the Canadian Cancer Society, Meals on Wheels

Clerkship programmes for Years 2, 3, and 4 are in development. These will consist of technical and clinical rotations in community and hospital pharmacy. As in the past, some of these rotations will be completed on a full-time basis during a period of up to 10 weeks following the second and third years of study.

* Students may be in practice sites outside of the Halifax area and will be responsible for any costs incurred as a result of the programme.

A. Prescribed Classes

Year 1

- ANAT 1010.03
- BIOC 1040.06
- CHEM 2442.03
- MICR 1050.03
- PHAC 1470.06
- PHAR 1070.03
- PHAR 1080.00
- PHYL 1400.06

Year 2

Information on classes in Year 2 will be made available at the time of (pre-)registration.

Year 3

- PHAC 1475.06
- PHAR 3000.00
- PHAR 3110.03
- PHAR 3140.03
- PHAR 3141.03
- PHAR 3320.06
- PHAR 3510.06
- PHAR 3700.03

Year 4

- PHAR 4110.03
- PHAR 4510.06
- PHAR 4511.03
- PHAR 4530.03
- PHAR 4720.03
- One additional full credit class and a half credit class in Pharmacy electives, or three half credit classes in Pharmacy electives

VI. Classes Offered

ANAT 1010.03: Human Anatomy.

This unit is an introduction to the structure of the normal human body, including both cell biology and gross anatomy. The central focus of the class will be to integrate structural principles across all levels of the continuum of anatomy and to build a fundamental knowledge of structure/function correlations throughout the systems of the body. Areas of focus will include the anatomy of the central nervous, respiratory, cardiovascular, genitourinary, and digestive systems.

COORDINATOR: G. Allen

FORMAT: Lecture 3 hours, tutorial 6 hours; 4 weeks

BIOC 1040.06: Biological Chemistry and Metabolism for Students of Pharmacy.

The structures, significance, and metabolism of the main biologically important compounds will be outlined in lectures, with some topics of particular interest being studied further in the laboratory. Tutorials aim to develop students' ability to learn biochemistry on their own and in small groups.

COORDINATOR: D. Russell

FORMAT: Lecture 3 hours, lab 3 hours, tutorial 6 hours; 7 weeks

PREREQUISITES: CHEM 2442.03, PHYL 1400.06, ANAT 1010.03

CHEM 2442.03: Introductory Organic Chemistry for Students of Pharmacy.

Essential principles of organic chemistry will be presented. This unit will enable students subsequently to understand important concepts in biochemistry and medicinal chemistry. Topics will include bonding, valencies, Lewis structures, functional groups, molecular orbitals, hybridization, shapes of molecules, isomerism, chirality, naming enantiomers, Fischer projections, molecules with stereocenters, optical activity, resolution and chirality in nature. Students will learn the nomenclature, reactivity and other properties of the principal functional groups. Structures and reactions of amino acids and proteins, as well as nucleosides, nucleotides and DNA will be introduced. Additional topics to be included are aromaticity, heterocycles, non-bonding interactions (hydrogen bonding, hydrophobic interactions, pi-stacking, etc.)

INSTRUCTOR: N. Schepp

FORMAT: Lecture 13 hours; 3 weeks

PREREQUISITE: CHEM 1010.06 or 1020.06 or 1040.06 or 1500.06 with a grade of at least C

MICR 1050.03: General Microbiology.

This class is geared to students in Pharmacy. Microbiology is taught over a three week period by way of tutorials, lectures and laboratory sessions. It addresses some basic principles of microbial structure, physiology and genetics in relation to microbial pathogenesis. General concepts and practices of sterilization with disinfection, antibiotics and immunity will be discussed. Laboratory sessions using demonstrations 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: Case-oriented problem solving (COPS)

PREREQUISITE: BIOL 1000.06 or instructor's consent

PHAC 1470.06, PHAC 1475.06: Pharmacology for Pharmacy.

This unit will provide an introduction to pharmacology, emphasizing basic mechanisms of drug action and principles of drug-receptor interactions, pharmacokinetics, and drug metabolism.

COORDINATOR: G. McKenzie

FORMAT: Lecture 3 hours, computer simulation lab 2 hours, tutorial 6 hours; 7 weeks

PREREQUISITES: BIOC 1040.06, MICR 1050.03, PHYL 1400.06

PHAR 1070.03: Pharmacy Skills Lab I.

First year skills labs provide an introduction to skills required by a practicing pharmacist. These include communication skills, pharmacy computer skills, prescription processing and compounding of special dosage forms.

COORDINATOR/INSTRUCTOR: T. Jurgens

FORMAT: Tutorial and/or lab 3 hours

PHAR 1080.00: Experiential.

The equivalent of one day service per week in nonpharmacy, health oriented community service such as the Canadian Cancer Society, Meals on Wheels. Purpose: development of communication skills, interpersonal skills, basic work habits such as punctuality, importance of team work and commitment, introduction to client needs and the health/helping professions ethic.

COORDINATOR: N. Harris

FORMAT: Total of 22 days during the academic year

HLTH 3000.03: An Interdisciplinary Approach to Health Promotion.

See class description in the Health Professions, Interdisciplinary section of this calendar.

HLTH 3001.03: Drugs Issues: An Interdisciplinary Perspective.

See class description in the Health Professions, Interdisciplinary section of this calendar.

HLTH 4900.03: An Interdisciplinary Approach to Gerontology (Social Perspectives).

See class description in the Health Professions, Interdisciplinary section of this calendar.

HLTH 4910.03: An Interdisciplinary approach to Gerontology (Health Perspectives).

See class description in the Health Professions, Interdisciplinary section of this calendar.

PHAR 3000.00B: Practical Training Programme.

This class consists of three weeks of experiential training in hospital pharmacy after the completion of third year. The community component of this class must be completed after the third year of study, prior to commencement of fourth year classes.

The student works with a practising pharmacist preceptor to gain experience in pharmacy services and systems. Students are responsible for finding their own preceptors and practice sites and are responsible for any costs incurred as a result of these programmes.

INSTRUCTOR: N. Wentzell

FORMAT: Three weeks (105 hours)

PREREQUISITE: Completion of all third year classes prior to the third year rotation

PHAR 3110.03: Introduction to Computer Dispensing and Prescription Management.

Students are introduced to basic prescription filling procedures on two prescription management systems.

INSTRUCTORS: TBA

FORMAT: Lecture 1.5 hours; lab 3-4 hours

PREREQUISITE: Successful completion of second year pharmacy

PHAR 3140.03: Pharmacokinetics.

Students are introduced to the basic principles of pharmacokinetics, such as quantitative aspects of drug absorption, distribution, metabolism and excretion.

INSTRUCTOR: TBA

FORMAT: Lecture 2 hours

PREREQUISITES: PHAR 2120.03, PHAR 2130.03

PHAR 3141.03: Clinical Pharmacokinetics.

This class deals with topics in clinical pharmacokinetics including: management of patients with renal failure, kinetics in pregnancy, placental drug transfer, hepatic drug clearance, transfer of drugs in breastmilk, relationship of pharmacokinetics and pharmacological response, non-linear pharmacokinetics, kinetics in geriatrics and pediatrics and the application of these principles to the clinical pharmacokinetics of representative drugs.

INSTRUCTOR: TBA

FORMAT: Lecture 3 hours

PREREQUISITE: PHAR 3140.03

PHAR 3320.06: Medicinal Chemistry II.

Principles of medicinal organic chemistry are demonstrated through an examination of the major classes of drugs in use today. Drug action, drug toxicity, and drug interactions are discussed in the context of mechanism and structure-activity relationships. The class is organized by classes of drug action, broadly: nonmessenger targets for drug action, drugs acting on neurotransmitters and their receptors, and drugs acting on hormones and their receptors. Current thorough understanding of the principles of organic chemistry, as studied in CHEM 2400.06, is assumed.

COORDINATOR: P.S. Farmer

INSTRUCTORS: P.S. Farmer, D.K. Yung

FORMAT: Lecture 4 hours (23 weeks)

PREREQUISITE: PHAR 2320.03

CO-REQUISITE: PHAR 3510.06

PHAR 3510.06: Therapeutics II.

Therapeutic and prophylactic use of prescription and some OTC drugs are discussed. Application of drug and disease knowledge to patient-focused care is emphasized.

COORDINATOR: A.M. Whelan

INSTRUCTOR: Staff

FORMAT: Lecture 2 hours; seminar 1 hour (average)

PREREQUISITES: PHAR 2510.06, PHYL 4403.06, MICR 2020.03, BIOC 3101.03 and 3102.03

CO-REQUISITES: PHAC 3470.06 or 3480.06; PHAR 3140.03 and 3141.03

PHAR 3700.03: Pharmacy Administration II.

This class provides the student with a basic understanding of some current health care issues related to pharmacy. In addition, students examine the concept of professionalism and are introduced to various health care professions.

COORDINATOR: TBA

FORMAT: Lecture/seminar 3 hours

PREREQUISITE: PHAR 1700.03

PHAR 4110.03: Senior Dispensing Lab.

This class is concerned with the proper compounding and dispensing of pharmaceutical products, and professional communication techniques.

INSTRUCTOR: S. Ferguson

FORMAT: TBA

PREREQUISITES: Successful completion of third year pharmacy

PHAR 4140.03: Introduction to Therapeutic Drug Monitoring.

The application of fundamental pharmacokinetic principles to the solution of commonly encountered therapeutic problems. Specific areas of focus will be on the estimation of drug dosage and adjustment, the underlying assumptions of commonly used dosing algorithms, reliability of analytical techniques, and the basic concepts of population pharmacokinetics. This class is presented in a problem-based format:

INSTRUCTOR: TBA

FORMAT: Seminar 3 hours

PREREQUISITES: PHAR 3140.03, 3141.03 or equivalent, permission of instructor

PHAR 4141.03: Current Topics in Xenobiotic Disposition.

The class focuses on pharmacokinetics, metabolism, pharmacodynamics, clinical pharmacology and therapeutic monitoring of drugs; therapeutic targets, therapeutic use and studies of natural chemicals, environmental toxins and their importance in aquaculture.

COORDINATOR: P. Yeung

INSTRUCTOR: Guest speakers

FORMAT: Seminar 3 hours

PREREQUISITES: PHAR 3140.03, 4530.03 or equivalent, permission of coordinator

NOTE: Preference will be given to students within the College of Pharmacy.

NOTE: The class is given every other year, check with the College.

PHAR 4330.03: 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 class emphasizes safety and efficacy of herbs and formulated herbal products.

INSTRUCTOR: T. Jurgens

FORMAT: Lecture 3 hours

PREREQUISITE: Consent of instructor

RECOMMENDED: Some knowledge of organic chemistry, human physiology and pharmacology is strongly recommended.

PHAR 4351.03: Medical Biotechnology I.

An introduction to biotechnology fundamentals from a medical perspective. Topics will include a DNA recombinant technology, the polymerase chain reaction, immunochemical techniques, tissue culture, monoclonal antibodies and hybridoma technologies.

INSTRUCTOR: A.K. Kirumira

FORMAT: Lecture 3 hours, some demonstrations

PREREQUISITE: BIOC 3101.03 and 3102.03; PHAC 3470.06 and consent of instructor

CROSS-LISTING: BIOC 4501.03

PHAR 4352.03: Medical Biotechnology II.

A discussion of the applications of biotechnology in medicine and pharmacy. Topics will include modern vaccines, antibiotics and interferon production, technology of innovative biotech drugs, medical diagnostic devices, genetic and immunoadaptive therapy, biotech drug delivery and monitoring systems, forensic medicine and DNA finger printing.

INSTRUCTOR: A.K. Kirumira

FORMAT: Lecture 3 hours, some demonstrations

PREREQUISITE: BIOC 3101.03 and 3102.03; PHAC 3470.06; PHAR 4351.03 and consent of instructor

CROSS-LISTING: BIOC 4502.03

PHAR 4510.06: Therapeutics III.

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 are conducted in conjunction with instruction and application of clinical pharmacy principles.

COORDINATOR: I. Sketris

INSTRUCTOR: TBA

FORMAT: Lecture/seminar 6 hours

PREREQUISITES: BIOC 3101.03 and 3102.03; PHAC 3470.06 or 3480.06; PHAR 3510.06, 3140.03, and 3141.03, consent of instructor.

PHAR 4511.03: Therapeutics IV.

A four-week clinical clerkship in participation sites that focuses on the on the provision of pharmaceutical care and other clinical pharmacy services in a patient oriented environment. Students may be assigned to sites not in the Halifax area and are responsible for any costs incurred as a result of the programme.

COORDINATOR: N. Wentzell

PHAR 4530.03: 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, application of pharmacokinetics, metabolism, and pharmacodynamics in novel drug development.

INSTRUCTOR: P. Yeung

FORMAT: Lecture 2 hours

PREREQUISITES: BIOC 3101.03 and 3102.03; PHAC 3470.06 or 3480.06; PHAR 3500.09, 3300.05, 3310.03 or consent of the instructor.

PHAR 4550.03: 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.

INSTRUCTOR: D. Reddy

FORMAT: Lecture 3 hours

PREREQUISITES: Consent of instructor

CO-REQUISITES: PHAR 4510.06

PHAR 4570.03: 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.

INSTRUCTOR: G.M. McKenzie

FORMAT: Lecture 2 hours

PREREQUISITE: PHAC 3470.06

PHAR 4720.03: Pharmacy Administration III.

This class provides students with a basic understanding of various components within the health care system. In addition, students are exposed to financial analysis, human resource management, marketing, ethics and pharmacy law.

COORDINATOR: D. Frail

FORMAT: Lecture/seminar 3 hours

PREREQUISITES: PHAR 3700.03

PHAR 4810.03: Hospital Pharmacy.

This seminar involves discussion of the principles of hospital pharmacy and therapeutics. Emphasis will be placed on enabling the student to acquire knowledge and skills to assist in performing the functions of a hospital pharmacist.

INSTRUCTOR: R. MacLaren

FORMAT: Seminar 4 hours

PREREQUISITE: Successful completion of third year Pharmacy

PHAR 4900.03: Drug Information.

The focus of this class is critical appraisal of the literature. Various written materials are considered: primary literature, overviews, clinical practice guidelines, pharmacoeconomic studies and promotional materials. Evaluation of these is practiced through a journal club experience and also through assignments. Other topics include: database searching, formulating and communicating responses to drug information requests, preparing and delivering presentations, information sources for herbals, organization of information resources and the pharmaceutical manufacturer as a source of drug information.

INSTRUCTOR: M. MacCara

FORMAT: Lecture/Seminar 3 hours

PREREQUISITES: PHAR 3500.09; PHAC 3470.06 or PHAC 3480.06

CO-REQUISITE: PHAR 4510.06

PHAR 4910.03: 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.

INSTRUCTORS: P. Yeung, M. Quilliam, G. Klassen, and T. Pollak

FORMAT: Lecture 2 hours

PREREQUISITES: BIOC 3101.03 and 3102.03; PHAC 3470.06 or 3480.06; PHAR 3510.06, 4530.03, or instructor's consent

CROSS-LISTING: PHAR 5910.03

PHAR 4950.03: Interdisciplinary Class in Human Nutrition.

See class description for NURS 4800.03 in the Nursing section of this calendar.

PHYL 1400.03A: Human Physiology.

This unit is designed to give a broad general understanding of normal human physiology, with such pathological changes as may be useful to illustrate the normal situations. Selected topics in biophysics and physiology will be presented in the tutorials and lectures. The central themes will include: neuromuscular; sex hormones and menstrual cycle; nervous system; cardiovascular, respiratory, gastrointestinal, and renal physiology. Evaluation will be based on tutorial participation and an end-of-unit examination along with ongoing self-evaluation through the unit.

COORDINATOR: N. Morgunov

FORMAT: Lecture 4 hours, tutorials 6 hours, 7 weeks

PREREQUISITES: ANAT 1010.03

Philosophy

Location: 1400 Henry Street
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Dean

Taylor, G.D., BA, PhD (Penn)

Chair

Campbell, R.M.

Undergraduate Advisors

Brett, N.C.
Maitzen, S.

Honours Advisor

Vinci, T.

Professor Emeritus

Braybrooke, D., BA (Harv), MA, PhD (Corn), FRSC

Professors

Burns, S.A.M., BA (Acadia), MA (Alta), PhD (Lond)
Campbell, R.M., BA (Harv), PhD (Corn)
Martin, R.M., BA (Col), MA, PhD (Mich)
Schotch, P.K., PhD (Waterloo)
Sherwin, S.B., BA (York), PhD (Stanford)

Associate Professors

Baylis, F., BA (McG), MA, PhD (Western) (Cross-appointed with the Faculty of Medicine)
Brett, N.C., BA (New Hampshire), MA, PhD (Waterloo)
Macintosh, D., BA (Queen's), MA (Waterloo), PhD (Tor)
Vinci, T., BA (Tor), MA, PhD (Pitts)

Assistant Professors

Campbell, S., BA, MA (Alta), PhD (Tor)
Hogan, M., AB (UC Berkeley), MA, PhD (Wisconsin)
Maitzen, S., BA (Northwestern), MA, PhD (Corn)

Adjunct Professor

Barresi, J., BSc (Brown), MA (S. Calif), PhD (Wisc)
Forde, C., PhD (York)
Kernohan, A., SB (MIT), MSc (Tor), MA (Dal), PhD (Tor)
Toankow, T., BA (SFU), PhD (Cantab.)
Wein, S., PhD (Waterloo)

I. 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 1000.06, or PHIL 1010.06, or PHIL 2040.03, or PHIL 2050.03) 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.

II. Degree Programmes

All students planning to take a degree in philosophy are encouraged to talk to an undergraduate advisor; those planning to do an honours degree must consult with the honours advisor. Students who intend to specialize in philosophy should take an honours degree, the normal preparation for graduate study in philosophy.

A. BA with Honours in Philosophy

See BA, BSc Concentrated Honours (4 year) under Degree Requirements.

Departmental Requirements

At least 10 credits in Philosophy of which at least 9 and no more than 11 are beyond the 1000 level.

Select at least one credit from the following:

Philosophy (logic) full-credit: 1111.06; half-credit: 1112.03, 2100.03, 2130.03, 2140.03, 2660.03, 3060.03, 3900.03

Select at least one credit from the following:

Philosophy (history) half-credit: 2350.03, 2370.03, 2610.03, 2620.03, 3630.03, 3640.03

- At least four credits at or above the 3000 level including a half-credit in epistemology (3051.03) and a half-credit in ethics (3105.03 or 3100.06) and at least one credit at the 4000 level
- Honours Thesis

B. BA with Combined Honours

See BA, BSc Combined Honours (4 year) under Degree requirements.

Departmental Requirements

At least 4 and no more than 9 credits in Philosophy beyond the 1000 level, including 2 beyond the 2000 level. Since the requirements for the combined honours degree vary (depending on the programme with which philosophy is combined) students must see an honours advisor. An honours thesis (or qualifying exam) in one of the two combined subjects is required.

Select at least one half credit from the following:

Philosophy (logic) full credit: 1111.06; half-credit: 1112.03, 2100.03, 2130.03, 2140.03, 2660.03, 3060.03, 3900.03

Select at least one half credit from the following:

Philosophy (history) half credit: 2350.03, 2370.03, 2610.03, 2620.03, 3630.03, 3640.03

At least two credits at or above the 3000 level including a half credit in epistemology (3051.03) and a half-credit in ethics (3105.03 or 3100.06).

C. BA with Advanced Major in Philosophy

See BA, BSc Advanced Major (4 years) under Degree Requirements.

Departmental Requirements

At least 6 and no more than 9 credits in Philosophy beyond the 1000 level, including 3 beyond the 2000 level.

Select at least one half credit from the following:

Philosophy (logic) full-credit: 1111.06; half-credit: 1112.03, 2100.03, 2130.03, 2140.03, 2660.03, 3060.03, 3900.03

Select at least one credit from the following:

Philosophy (history) half-credit: 2350.03, 2370.03, 2610.03, 2620.03, 3630.03, 3640.03

At least three credits at or above the 3000 level including a half credit in epistemology (3051.03) and a half-credit in ethics (3105.03 or 3100.06).

D. BA with Advanced Double Major

See BA, BSc Advanced Double Major (4 year) under Degree requirements.

Departmental Requirements

At least 4 and no more than 9 credits in Philosophy beyond the 1000 level, including 2 beyond the 2000.

Select at least one half credit from the following:

Philosophy (logic) full credit: 1111.06; half-credit 1112.03, 2100.03, 2130.03, 2140.03, 2660.03, 3060.03, 3900.03

Select at least one credit from the following:

Philosophy (history) half credit: 2350.03, 2370.03, 2610.03, 2620.03, 3630.03, 3640.03

At least two credits at or above the 3000 level including at least a half credit in epistemology (3051.03) or a half-credit in ethics (3105.03 or 3100.06)

E. BA with Major in Philosophy

See BA, BSc Major (3 year) under Degree requirements.

Departmental Requirements

At least 4 and no more than 8 credits in Philosophy beyond the 1000 level, including 2 beyond the 2000 level.

Select at least one half credit from the following:

Philosophy (logic) full credit: 1111.06; half-credit 1112.03, 2100.03, 2130.03, 2140.03, 2660.03, 3060.03, 3900.03

Select at least one half credit from the following:

Philosophy (history) half credit: 2350.03, 2370.03, 2610.03, 2620.03, 3630.03, 3640.03

At least two credits at or above the 3000 level including at least a half credit in epistemology (3051.03) or a half-credit in ethics (3105.03 or 3100.06).

III. Classes Offered

NOTE: Many classes are listed as being exclusionary to one another. This means that students may not take both classes so designated.

Classes at the 4000 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.

NOTE: Classes marked * may not be offered every year. Please consult the current timetable to determine if these classes are offered.

Detailed descriptions are available from the department on request.

PHIL 1000.06: 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

EXCLUSION: PHIL 1010.06, PHIL 2040.03 and PHIL 2050.03

PHIL 1010.06: Introduction to Philosophy.

See description for PHIL 1000.06. This class does satisfy the Faculty Writing Requirement.

INSTRUCTOR: Staff

FORMAT: Writing Requirement, lecture /discussion 2-3 hours

EXCLUSION: PHIL 1000.06, PHIL 2040.03 and PHIL 2050.03

***PHIL 1080.03: 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, M. Hogan

FORMAT: Lecture/discussion 2 hours

EXCLUSION: PHIL 1090.03

PHIL 1100.03: 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 2-3 hours

***PHIL 1112.03: Logic: Elementary Symbolic Logic.**

An abbreviated version of PHIL 1111.06. Meets logic requirement for majors only if taken in first-year.

INSTRUCTORS: P. Schotch, R. Martin

FORMAT: Lecture/discussion 2 hours

EXCLUSION: PHIL 1111.06, PHIL 2110.06 and PHIL 2130.03

***PHIL 2040.03/PHIL 2050.03: Introduction to Philosophy I and II.**

See description for PHIL 1000.06 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

EXCLUSION: PHIL 1000.06 and PHIL 1010.06

PHIL 2070.06: Foundations of Political Thought II: Rights, Rationality, and Democracy.

See class description for POLI 2401.06, in the Political Science section of this calendar.

***PHIL 2081.03: Ethics in the World of Business.**

See description for 2080.06.

INSTRUCTOR: Staff

FORMAT: Lecture/discussion 2-3 hours

EXCLUSION: PHIL 2080.06

***PHIL 2100.03: 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

PHIL 2130.03: Logic: Deduction.

A systematic introduction to the operations of formal deductive logic. The same topics are covered as in PHIL 1111.06, 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.M. Martin

FORMAT: Lecture/discussion 2 hours

EXCLUSION: PHIL 1111.06, PHIL 1112.03 and PHIL 2110.06

PHIL 2140.03: 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.K. Schotch

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: PHIL 1111.06, PHIL 1112.03 or PHIL 2130.03

PHIL 2160.03: 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

CROSS-LISTING: WOST 2500.03

***PHIL 2205.03: Philosophy of Religion.**

Monotheistic religions (such as Judaism, Christianity, and Islam) assert the existence of a single God. This class addresses philosophical problems posed by traditional monotheism. Why care whether monotheism is true? Why care whether belief in God is rational? Does the rationality of belief in God depend on the evidence for and against God's existence? What is the best evidence for and against? What bearing does God have on human morality?

INSTRUCTOR: S. Maitzen

FORMAT: Lecture/discussion 2 hours

EXCLUSION: PHIL 2200.06

***PHIL 2260.03: Philosophy of Art.**

Examines questions such as: What is art? Can judgments of artistic value be rational and objective? Can fear of fictional objects be real fear? Can music be a language?

INSTRUCTOR: S.A.M. Burns

FORMAT: Lecture/discussion 2 hours

PHIL 2270.06: Foundations of Political Thought I: Order, Knowledge, and Natural Law.

See class description for POLI 2400.06, in the Political Science section of this calendar.

PHIL 2350.03 and *PHIL 2370.03: 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. Vinci, S.A.M. Burns

FORMAT: Lecture/discussion 3 hours

PREREQUISITE: One previous class in philosophy

***PHIL 2361.03 and *PHIL 2362.03: Classical and Early Christian Philosophy.**

See class descriptions for CLAS 2361.03B and CLAS 2362.03, in the Classics section of this calendar.

***PHIL 2380.06: Medieval Philosophy.**

See class description for CLAS 3380.06, in the Classics section of this calendar.

***PHIL 2410.03: Philosophy of Psychology.**

An examination of philosophical issues arising from the scientific study of the mind.

INSTRUCTOR: M. Hogan

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: One previous class in philosophy or psychology

***PHIL 2480.03: 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: Staff

FORMAT: Lecture and discussion

PHIL 2610.03: 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

PHIL 2620.03: History of Philosophy: The Empiricists.

The philosophy of Locke, Berkeley, and Hume, with an introduction to Kant.

INSTRUCTORS: S.A.M. Burns, T. Vinci, D. MacIntosh

FORMAT: Lecture/discussion 3 hours

PREREQUISITE: One previous class in philosophy

***PHIL 2660.03: Logic: Understanding Scientific Reasoning.**

An introduction to the basic patterns of scientific thought.

INSTRUCTOR: Staff

FORMAT: Lecture/discussion 3 hours

***PHIL 2705.03: 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

EXCLUSION: PHIL 2700.06

PHIL 2710.03: Existentialism.

A general introduction to existentialist themes and authors including Kierkegaard, Nietzsche, Sartre, and Camus.

INSTRUCTOR: N. Brett

FORMAT: Lecture/discussion 2-3 hours

PHIL 2800.06: 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 3 hours

PHIL 3051.03: 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: R. Campbell, D. MacIntosh, T. Vinci

FORMAT: Lecture/discussion 3 hours

PREREQUISITE: PHIL 2610.03, PHIL 2620.03 or permission of the instructor

EXCLUSION: PHIL 3050.06

CROSS-LISTING: PHIL 5051.03

***PHIL 3060.03: Logic: Logical Theory II.**

Devoted primarily to the study of formal semantics and its relation to symbolic language.

INSTRUCTOR: P.K. Schotch

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: PHIL 2130.03, PHIL 2140.03 or permission of the instructor

CROSS-LISTING: PHIL 5060.03

***PHIL 3105.03: 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: N. Brett

FORMAT: Lecture/discussion 2-3 hours

PREREQUISITE: Two previous classes in philosophy

EXCLUSION: PHIL 3100.06

CROSS-LISTING: PHIL 5105.03

PHIL 3170.03: 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. Campbell, S. Sherwin

FORMAT: Seminar 2 hours

PREREQUISITE: Two previous classes in Philosophy or Women's Studies

CROSS-LISTING: WOST 3500.03

***PHIL 3211.03: 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 3 hours

PREREQUISITE: Two previous classes in philosophy, or instructor's consent

CROSS-LISTING: PHIL 5211.03

***PHIL 3265.03: 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, S. Campbell

FORMAT: Lecture

PREREQUISITE: PHIL 2260.03 or instructor's consent

CROSS-LISTING: PHIL 5265.03

PHIL 3300.03: Philosophy of Language.

What does it mean to say that the elements of language have meaning?

INSTRUCTORS:

M. Hogan, D. MacIntosh, R. Martin

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: Two previous classes in philosophy including one logic class, half- or full-year

CROSS-LISTING: PHIL 5300.03

***PHIL 3420.03: 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

EXCLUSION: PHIL 2420.03

CROSS-LISTING: BIOL 3580.03, PHIL 5420.03

***PHIL 3440.03: Philosophy of Mind.**

A systematic study of the mind-body problem and/or theories of personal identity.

INSTRUCTOR: S. Campbell, M. Hogan

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: Two previous classes in philosophy

CROSS-LISTING: PHIL 5440.03

***PHIL 3460.03: 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: M. Hogan

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: Two previous classes in philosophy

CROSS-LISTING: PHIL 5460.03

***PHIL 3475.03: Democratic Theory.**

See class description for POLI 3475.03 in the Political Science section of this calendar.

***PHIL 3530.03: 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

PREREQUISITE: Two previous classes in philosophy

CROSS-LISTING: PHIL 5530.03

***PHIL 3630.03: History of Philosophy: Kant.**

Special attention will be paid to Kant's metaphysics.

INSTRUCTOR: T. Vinci

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: PHIL 2610.03 or PHIL 2620.03 or permission of the instructor

CROSS-LISTING: PHIL 5630.03

***PHIL 3640.03: 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

CROSS-LISTING: PHIL 5640.03

***PHIL 3650.03: Modern Philosophy.**

"Modern Philosophy" refers to a philosophical perspective that arose during the great advances of Western science in the 17th and 18th centuries. Modern Philosophy seeks to advance the thesis that persons are beings with conscious thoughts (ideas) and that all of the interesting forms of contact people have with the world - perceptual, semantic, epistemic, casual - are mediated by conscious thoughts. Modern Philosophy also seeks to reconcile this thesis with the scientific/materialistic image of the world then emerging. This class involves a study of the systematic properties of this perspective employing both historical primary sources and contemporary commentary. (This class is designed to complement PHIL 3660.03 but can be taken independently.)

INSTRUCTOR: T. Vinci

FORMAT: Lecture/tutorial

PREREQUISITE: PHIL 2160.03, 2620.03 or permission of the instructor

CROSS-LISTING: PHIL 5650.03

***PHIL 3660.03: Post-Modern Philosophy.**

Modern Philosophy is a philosophical perspective in which individuals and their conscious thoughts are paramount. Post-modern philosophy rejects this perspective, replacing it with one in which language and society are paramount. We shall study this perspective in the writings of post-Wittgenstein philosophers like Sellars and Rorty in the English-speaking world as well as those like Derrida and Habermas on the Continent. (This class is designed to complement PHIL 3650.03 and 3640.03 but can be taken independently).

INSTRUCTOR: T. Vinci

FORMAT: Lecture/tutorial

PREREQUISITE: Permission of the instructor

CROSS-LISTING: PHIL 5660.03

***PHIL 3670.03: 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, T. Vinci

FORMAT: Lecture/discussion

PREREQUISITE: At least two previous classes in philosophy, including one half- or full-year logic class such as PHIL 2660.03

CROSS-LISTING: PHIL 5670.03

***PHIL 3851.03: 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: M. Hogan, S. Maitzen

FORMAT: Lecture/discussion

PREREQUISITE: Two previous philosophy classes including at least one half- or full-year logic class

CROSS-LISTING: PHIL 5851.03

***PHIL 3900.03: 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 paradox, 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: R. Campbell

FORMAT: Lecture/discussion

PREREQUISITE: Two previous philosophy classes including one half- or full-year class in modern symbolic logic

CROSS-LISTING: PHIL 5900.03

***PHIL 4055.03: Topics In Epistemology**

INSTRUCTOR: S. Maitzen

CROSS-LISTING: PHIL 5055.03

***PHIL 4070.03: Topics in Philosophy of Psychology**

INSTRUCTOR: M. Hogan

CROSS-LISTING: PHIL 5070.03

***PHIL 4115.03: Topics in Ethics I**

CROSS-LISTING: PHIL 5115.03

***PHIL 4120.03: Theory of Rational Decision.**

A study of foundational problems in contemporary theory of rational decision, drawing on work by philosophers, psychologists, economists and mathematicians.

INSTRUCTORS: R. Campbell, D. MacIntosh

CROSS-LISTING: PHIL 5120.03

***PHIL 4190.03: Topics in the History of Philosophy I**

CROSS-LISTING: PHIL 5190.03

***PHIL 4191.03: Topics in the History of Philosophy II**

CROSS-LISTING: PHIL 5191.03

***PHIL 4192.03: Topics in the History of Philosophy III**

CROSS-LISTING: PHIL 5192.03

***PHIL 4200.03: Topics in Normative Theory**

CROSS-LISTING: PHIL 5200.03

***PHIL 4215.03: Topics in the Philosophy of Law**

CROSS-LISTING: PHIL 5215.03

***PHIL 4220.03: 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, theories of causation, reduction.

INSTRUCTOR: Staff

CROSS-LISTING: PHIL 5220.03

***PHIL 4470.03: 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: N. Brett

FORMAT: Seminar

PREREQUISITE: Permission of the instructor

CROSS-LISTING: POLI 4479.03/5479.03, ECON 4446.03/5446.03, PHIL 5470.03

***PHIL 4480.03: 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

CROSS-LISTING: POLI 4480.03/5480.03, ECON 4448.03/5448.03, PHIL 5480.03

***PHIL 4500.03: 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)

CROSS-LISTING: WOST 4500.03, PHIL 5500.03

***PHIL 4510.03: Topics in the Philosophy of Language**

CROSS-LISTING: PHIL 5510.03

***PHIL 4680.03: Topics in the Philosophy of Science**

CROSS-LISTING: PHIL 5680.03

***PHIL 4801.03: Topics in Ethics and Health Care**

INSTRUCTOR: S. Sherwin

PREREQUISITE: PHIL 2800.06

CROSS-LISTING: PHIL 5801.03

***PHIL 4855.03: Topics in Metaphysics**

CROSS-LISTING: PHIL 5855.03

PHIL 4940.03/4960.03/ 4980.03/4970.06/ 4990.06:

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

Physical Education

See School of Health and Human Performance (pg. 148).

Physics

Location: Sir James Dunn Science Building
Halifax, NS B3H 3J5
Telephone: (902) 494-2337
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Homepage: www.physics.dal.ca
E-mail: physics@dal.ca

Interim Dean

Ryall, P.J.C., BSc (Dal), MSc (Alta), PhD (Dal), Associate Professor
(Earth Sciences)
Telephone: (902) 494-3540

Chair of Department

Kiang, D.

Undergraduate Advisor

Kiang, D. (494-2315)

Graduate Advisor

Dunlap, R.A. (494-2394)

Coordinator, Diploma in Meteorology

Folkins, I. (494-3701)

Coordinator, Co-op Programme

Stroink, G. (494-7062)

Professors Emeriti

Archibald, W.J., MA (Dal), PhD (Virg), DSc (UNB), LL.D. (Dal), FRSC
Betts, D.D., BSc, MSc (Dal), PhD (McG), FRSC - Research

Professors

Blackford, B.L., BSc (Acadia), MSc (MIT), PhD (Dal)
Calkin, M.G., BSc, MSc (Dal), PhD (UBC)
Chylek, P., Physics Diploma (Charles U., Czech.), PhD (Calif-Riverside), FOSA - joint appointment with Oceanography
Coley, A.A., PhD (London) - cross appointment with Math and Statistics
Dahn, J.R., BSc (Dal), MSc, PhD (UBC), NSERC/3M Canada Industrial Research Chair - cross appointment with Chemistry
Dunlap, R.A., BS (Worcester), AM (Dart), PhD (Clark)
Geldart, D.J.W., BSc (Acadia), PhD (McM), FRSC - Research
Jericho, M.H., BSc, MSc (Dal), PhD (Cantab) - George Munro Professor of Physics
Kiang, D.B.I., BSc (MtA), MSc, PhD (McM)
Kreuzer, H.J., MSc, DSc (Bonn), FRSC - Faculty of Science Killam Professor, A.C. Fales Professor of Theoretical Physics
Langstroth, G.F.O., BSc (Alta), MSc (Dal), PhD (London)
Paton, B.E., BSc, MSc (Waterloo), PhD (McG)
Reynolds, P.H., BSc (Tor), PhD (UBC) - cross appointment with Earth Sciences
Simpson, A.M., BA (Cantab), MSc, PhD (Dal)
Stroink, G., BSc, MSc (Delft), PhD (McG), PEng - cross appointment with Physiology and Biophysics
White, M.A., BSc (Western), PhD (McM) - cross appointment with Chemistry

Associate Professors

Cordes, J.G., BSc, MSc (Dal), PhD (Cantab)
Goble, D.F., BSc, MSc (Alta), PhD (Tor)
Labrie, D., BSc (Montreal), MSc, PhD (McM)
Tindall, D.A., BA, PhD (Cantab)

Assistant Professors

- Folkens, L., BSc (Dal), MSc, PhD (Tor) - cross appointment with Oceanography
Fu, Q., BS, MS (Peking), PhD (Utah) - cross appointment with Oceanography
Haic, M.E., BSc, PhD (UNB) - cross appointment with Radiation Oncology
Lohmann, U., MSc, PhD (Hamburg) - joint appointment with Oceanography

Senior Instructors

- Fyfe, F.M., MSc (Dal)
Zukauskas, W., BSc (Dal)

Adjunct Professors

- Ravindra, R., BSc, MTech (IIT, Kharagpur), MA (Dal), MSc, PhD (Tor) - major appointment with Comparative Religion

Honorary Adjunct Professors

- Jan, N., PhD (Cambridge), Physics, St. Francis Xavier U.
Lawther, D.W., PhD (Dal), U. of Prince Edward Island
Leitch, W.R., PhD (York), Atmospheric Environment Services
Pink, D.A.H., PhD (UBC), Physics, St. Francis Xavier U.
Purcell, C.J., PhD (Dal), Defence Research Establishment Atlantic
Steinitz, M., PhD (Northwestern), Physics, St. Francis Xavier U.

Research Associates

- Das, A.K., DPhil (Oxon)
Lesins, G.B., PhD (Tor)
Payne, S.H., PhD (Canterbury, NZ)
Senba, M., PhD (Rutgers)
Wang, R.L., PhD (Dal)

Postdoctoral Fellows

- Azzouz, M., PhD (Grenoble)
MacKay, G., PhD (Dal)
Mao, O., PhD (McGill)
Paulsen, J., PhD (Tech. U. of Dresden)
Tso, W., PhD (Stevens Inst. of Tech.)
Wang, M., PhD (Utah)

MacGregor Teaching Fellows

- Billyard, A. Bulel, E.
Dobbie, J.S. Patchedjiev, S.
Otrovac, M. Richard, M.

I. 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.

The Honours programme is a focused, intensive programme aimed at those intending to pursue either graduate study or professional research work either in physics or in allied sciences. The various Majors programmes provide the opportunity to pursue a broad education in both physics and other allied areas. Such programmes provide a suitable background for employment in industry, and for further studies in such fields as meteorology, engineering, education, law, medicine and business.

First Year Classes

There are four first year classes. PHYC 1450.06 is a general interest class for BA students and is not acceptable as a prerequisite for further classes in physics. PHYC 1000.06, 1100.06, and 1300.06 all give a general introduction to physics, but each has its own particular approach and selection of topics.

PHYC 1000.06 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.

PHYC 1100.06 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 accepted as a prerequisite for advanced physics classes. Background in physics equivalent to Nova Scotia Grade XII is strongly recommended.

PHYC 1300.06 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 1000.03 and 1010.03B are taken concurrently. Background in physics equivalent to Nova Scotia Grade XII, is strongly recommended.

II. Degree Programmes

Students should consult the "Degree Requirements" section of this calendar for specific regulations.

A. 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 the Undergraduate Advisor of the department at the beginning of the second year.

Departmental Requirements

1000 level

- PHYC 1100.06 or 1300.06 or SCIE 1500.30

2000 level

- PHYC 2000.03
- PHYC 2005.03
- PHYC 2010.03
- PHYC 2015.03

3000 level

- PHYC 3000.03
- PHYC 3010.03
- PHYC 3090.03
- PHYC 3140.03
- PHYC 3200.03
- PHYC 3210.03

4000 level

- PHYC 4000.03
- PHYC 4100.03
- PHYC 4151.03
- PHYC 4160.03
- PHYC 4800.03
- 1.5 other 4000-level physics credits

Other required classes

- CHEM 1011.03/1012.03
- MATH 1000.03/1010.03
- MATH 2001.03/2002.03 or MATH 2480.03/2490.03
- MATH 2030.03/2040.03
- MATH 3110.03
- MATH 3120.03

COMP 1400.03/1410.03 is recommended to be taken before the end of the second year

Honours Qualifying Examination

This is written near the end of the fourth year.

NOTE: The Calendar regulation "minimum of nine (9), maximum of eleven (11) credits in the honours subject" cannot include PHYC 2450.06, 4020.03.

Under exceptional circumstances, permission may be granted to substitute PHYC 4311.03 for PHYC 4000.03.

Students with special interests must select electives carefully. The following suggestions may serve as a guide.

Applied Physics Option: PHYC 3250.03, 3340.03, 3440.03, 3810.03, 4220.03. Up to five classes may be chosen as general electives from the Faculty of Engineering. Participation in the Co-op Programme is encouraged.

Theoretical Physics Option: PHYC 4152.03, 4170.03, 4180.03, 4480.03, 4650.03/4660.03; Mathematics classes such as complex variables, modelling, or advanced differential equations.

B. 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. In recent years, students have followed programmes combining physics with mathematics, biology, earth science, chemistry, and computer science. Students contemplating such a programme should, in any case, consult the department before the beginning of their second year of study.

C. Advanced Major (20-credits)

Departmental Requirements

1000 level

- PHYC 1100.06 or 1300.06

2000 level

- PHYC 2000.03
- PHYC 2005.03
- PHYC 2010.03
- PHYC 2015.03
- One other Physics credit at or above the 2000 level not including classes listed below.

3000 level

- PHYC 3160.03 or 3200.03
- 2.5 other physics credits at the 3000 level or above

Other required classes

- MATH 1000.03/1010.03
- Either MATH 2001.03/2002.03 or MATH 2480.03/2490.03

NOTE: The degree requirement of "Minimum of six (6), maximum of nine (9) credits in the major subject beyond the 1000-level" cannot include any of the following: PHYC 2450.06, 4020.03.

D. BSc Major in Physics

(Example only, other possibilities exist)

Departmental Requirements

1000 level

- PHYC 1100.06 or 1300.06

2000 level

- PHYC 2000.03
- PHYC 2005.03
- PHYC 2010.03
- PHYC 2015.03

3000 level

- PHYC 3160.03 or 3200.03
- 1.5 other physics credits at the 3000 level or above

Other required classes

- MATH 1000.03/1010.03
- Either MATH 2001.03/2002.03 or MATH 2480.03/2490.03
- CHEM 1011.03/1012.03

NOTE: The degree requirement of "Minimum of four (4), maximum of eight (8) credits in the major subject beyond the 1000-level" cannot include any of the following: PHYC 2450.06, 4020.03.

E. BSc with a Minor in Business

The BSc Honours in Physics with Minor in Business and the BSc Advanced Major in Physics with Minor in Business are four year degree programmes which combine physics with classes in business.

The requirements of the Minor are five full credits of the twenty credits and should include:

- COMM 1000.03
- COMM 1501.03
- COMM 2101.03
- COMM 2301.03
- COMM 2401.03

One of the five credits should be at the 3000 or 4000 level.

Application for admission must be made to the department and the School of Business Administration on the forms available from the Registrar's Office. Students should apply before registering for their second year.

F. Co-operative Education Programme in Physics

The Co-operative Education 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 an appreciation of the work place. The work-term experience gives students an opportunity to orient themselves at an early stage towards practical applications of their newly acquired skills and knowledge, and adds to their motivation for academic study.

Admission to the Programme

Admission to the programme should be sought before entering the second year of study. Entry to the programme requires a first-year average over all subjects of at least B, and in physics of at least B+. Admission requirements and other information can be found in this Calendar in the section entitled "Co-operative Education in Science". Co-operative Education programmes are arranged for both Honours and Advanced Major students.

The academic requirements for the co-operative programmes are the same as for the traditional programme. In addition, Co-op students participate in SCIE 8700.00, a non-credit Co-op seminar programme. Students must register for this class and for each work-term class (e.g. PHYC 8891.00).

The five-year programme consists of eight academic terms and four supervised work-terms.

The scheduling of Co-op work terms must be taken into account in planning class selection. The first work term is either in the winter of a student's second year, or in the summer following the student's second year. Full credit classes may be scheduled during summer terms when the student does not have a work term.

Students who are interested in enrolling in a Co-op programme are urged to contact the Co-op Programme Coordinator as early as possible in their academic career.

Further Information

Further information can be obtained by contacting either of the following locations:

Programme Coordinator
Co-operative Education Programme in Physics
Department of Physics
Dalhousie University
Halifax, Nova Scotia B3H 3J5
Telephone: (902) 494-2337

Science Co-operative Education Dalhousie University
Student Union Building, Room 404
6136 University Avenue
Halifax, Nova Scotia B3H 4J2
Telephone: (902) 494-2044

G. Honours Co-op in Physics

Departmental Requirements

Same as for the regular Honours in Physics as above with the addition of the following:

- Four supervised work-terms: PHYC 8891.00, 8892.00, 8893.00, 8894.00
- Co-op Seminar: SCIE 8700.00

It is strongly recommended that students take COMP 1400.03/1410.03 in their first year.

Suggested Programme

Year 1

Terms A and B

- CHEM 1011.03/1012.03 or equivalent
- MATH 1000.03/1010.03
- PHYC 1100.06
- One credit of an elective in the languages and humanities group which will satisfy the writing requirement

Year 2

Term A

- MATH 2001.03
- MATH 2030.03 or 2480.03
- PHYC 2000.03
- PHYC 2005.03
- SCIE 8700.00
- Technical elective (MATH 2300.03 recommended)

Term B

- PHYC 8891.00 (Workterm I)

Summer

- Social science elective (full-credit)
- Elective (MATH 2060.03 recommended)

Year 3

Term A

- PHYC 8892.00 (Workterm II)

Term B

- MATH 2002.03
- MATH 2040.03 or 2490.03
- PHYC 2010.03
- PHYC 2015.03
- Elective

Summer

- PHYC 8893.00 (Workterm III)

Year 4

Term A

- MATH 3110.03
- PHYC 3000.03
- PHYC 3140.03
- PHYC 3200.03
- Elective (PHYC 3250.03 or MATH 3260.03 recommended)

Term B

- MATH 3120.03
- PHYC 3010.03
- PHYC 3090.03
- PHYC 3210.03
- Elective (PHYC 3440.03 recommended)

Summer

- PHYC 8894.00 (Workterm IV)

Year 5

Terms A and B

- PHYC 4000.03
- PHYC 4151.03
- PHYC 4160.03
- PHYC 4100.03
- PHYC 4800.03

- One credit worth of 4000-level physics electives
- 1.5 credits of technical electives

H. Advanced Major Co-op in Physics

Departmental Requirements

Same as for the regular Advanced Major in Physics as above with the addition of the following:

- Four supervised work-terms: PHYC 8891.00, 8892.00, 8893.00, 8894.00
- COMP 1400.03/1410.03 are strongly recommended
- Co-op Seminar: SCIE 8700.00

It is strongly recommended that students take COMP 1400.03/1410.03 in their first year.

I. Earth Systems Science

Classes in Physics can form part of an integrated programme in Earth Systems Science. For more information, see the Earth Systems Science section of this calendar. Interested students are encouraged to consult with the Undergraduate Advisor.

J. Geophysics

For those interested in Geophysics, it is recommended that they take the classes required for a Combined Honours in Physics and Earth Sciences, or for Honours Physics, and choose as their electives a selection of the following classes: EARTH 2050.03, 3130.03, 4270.03, 4280.03.

K. Graduate Studies

The Department of Physics provides classes 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 Coordinator for the Physics Department.

III. Diploma in Meteorology

The Diploma in Meteorology is offered every second year beginning in 1998/99. Please contact the Coordinator, Diploma in Meteorology, for further information.

Required classes

- PHYC 4500.03/4510.03
- PHYC 4540.03/4550.03
- OCEA 4411.03/4412.03
- OCEA 4120.03
- OCEA 4595.03
- PHYC 4520.03, OCEA 4515.03 or other classes approved by Programme Coordinator to total 2 additional half credits

Required GPA for graduation - 1.70

Total credits required - 5

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 Dalhousie, the following classes are recommended: PHYC 1100.06, 2000.03, 2005.03, 2010.03, 2015.03, 3170.03; MATH 1000.03/1010.03, 2000.03, 2030.03/2040.03, 2060.03/2080.03, 3110.03/3120.03; and COMP 1400.03/1410.03.

After completion of the Diploma programme, students are eligible for admission into a graduate programme in Atmospheric Science at Dalhousie.

IV. 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 1000.06: 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 class 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. Since this class has no lab, some medical, dental and professional health schools may not accept it as a required physics class.

INSTRUCTOR: D.F. Goble

FORMAT: Lectures 3 hours, tutorial 1 hour

PREREQUISITE: Familiarity with algebra, graphs and trigonometry

EXCLUSION: Credit will be given for only one of PHYC 1000.06, 1100.06, 1280.03/1290.03, 1300.06, or 1310.03/1320.03

PHYC 1100.06: 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 1000.03/1010.03) 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. NOTE: Section 02 is for Engineering students only.

INSTRUCTORS: J. Dahn

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.

EXCLUSION: Credit will be given for only one of PHYC 1000.06, 1100.06, 1280.03/1290.03, 1300.06, or 1310.03/1320.03

PHYC 1280.03/1290.03: Introduction to Physics.

These two half classes are, as a pair, equivalent to PHYC 1100.06. They are available ONLY to accommodate special circumstances; permission from the Department is required.

EXCLUSION: Credit will be given for only one of PHYC 1000.06, 1100.06, 1280.03/1290.03, 1300.06, or 1310.03/1320.03

PHYC 1300.06: 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 MATH 1000.03 and 1010.03. Basic concepts in physics are applied, where possible, to realistic biological models, e.g. forces and torques are related to muscles and joints, electricity to cellular activity, fluids to blood circulation, etc.

INSTRUCTOR: G. Stroink

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITE: Students should have a background in Physics equivalent to Nova Scotia Grade XII level

EXCLUSION: Credit will be given for only one of PHYC 1000.06, 1100.06, 1280.03/1290.03, 1300.06, or 1310.03/1320.03

PHYC 1310.03/1320.03: Physics In and Around You

These two half classes are, as a pair, equivalent to PHYC 1300.06. They are available ONLY to accommodate special circumstances; permission from the Department is required.

EXCLUSION: Credit will be given for only one of PHYC 1000.06, 1100.06, 1280.03/1290.03, 1300.06, or 1310.03/1320.03

PHYC 1450.06: Astronomy: The Evolving Universe.

This class meets the science distribution requirements for B.A. students. The class does not count as a prerequisite for any other science class. Algebra and geometry are used only when helpful. Both the universe and our understanding of it are evolving. The aim of this class is the development of a coherent, though temporary and

incomplete, view of the astronomical universe, a view where both familiar elements and strange each have their places. Topics include "naked eye" astronomy; nature and properties of Sun and stars, stellar evolution from gas cloud to black hole; cosmology - the origin and fate of the universe; the solar system.

INSTRUCTOR: R. Dunlap, W. Zukauskas

FORMAT: Lecture 3 hours

EXCLUSION: Credit will be given for only one of PHYC 1450.06 and 2450.06.

PHYC 2000.03: 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: Staff

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITES: PHYC 1100.06 or 1300.06 or SCIE 1500.30, a 1000-level calculus class, or permission of the instructor.

PHYC 2005.03: Mechanics and Relativity.

Topics include kinematics in rectangular and polar coordinates, application of Newton's laws, momentum and varying mass systems, work and energy, angular momentum and fixed axis rotation, rigid body motion, non-inertial systems, relativistic kinematics, relativistic momentum and energy.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours, tutorial 3 hours

PREREQUISITES: PHYC 1100.06 or PHYC 1300.06 or SCIE 1500.30, a 1000-level calculus class, or permission of the instructor.

PHYC 2010.03: 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: M.H. Jericho

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITES: PHYC 1100.06 or 1300.06 or SCIE 1500.30 (PHYC 2000.03 and PHYC 2005.03 recommended), and a 1000 level calculus class

PHYC 2015.03: 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 tunnelling is used to explain field emission, alpha decay, and the scanning tunnelling microscope. Applications of modern physics are discussed and illustrated through the tutorial sessions.

INSTRUCTOR: D. Kiang

FORMAT: Lecture 3 hours, tutorial 3 hours

PREREQUISITE: PHYC 1100.06 or 1300.06 or SCIE 1500.30 (PHYC 2000.03 and PHYC 2005.03 recommended) and a 1000 level calculus class

***PHYC 2240.03: Intermediate Physics for Medicine and Biology I.**

This class will apply first-year knowledge of physics and mathematics to the understanding of some physical principles of physiological and biological systems. It will cover both applications of physics and instrumentation for the measurement of physiological properties. Topics include: basic thermodynamics, transport through membranes, electrophysiology, and the principles of electrical measurement techniques such as the electrocardiogram.

INSTRUCTOR: G.F.O. Langstroth

FORMAT: Lecture 3 hours

PREREQUISITES: PHYC 1100.06 or 1300.06; MATH 1000.03/1010.03; or SCIE 1500.30; or permission of the instructor.

* Offered in alternate years beginning in 1998-99.

***PHYC 2250.03: Intermediate Physics for Medicine and Biology II.**

This class follows the same approach as PHYC 2240.03, but with rather different emphasis. It focuses on the nature of different forms of radiation and their interactions with living organisms. Particular attention is given to imaging techniques for the examination of internal organs, and the resulting effects of radiation. Topics may include ultrasound, nuclear medicine, X-ray tomography, magnetic resonance imaging, and exposure to ultraviolet and nuclear radiation.

INSTRUCTOR: G.F.O. Langstroth

FORMAT: Lecture 3 hours

PREREQUISITE: PHYC 2240.03 or permission of the instructor.

*Offered in alternate years beginning in 1998-99.

PHYC 2450.06: 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: D.A. Tindall

FORMAT: Lecture 3 hours

PREREQUISITE: One first-year science class

EXCLUSION: Credit will be given for only one of PHYC 1450.06 and 2450.06.

NOTE: PHYC 2450.06 is not eligible to be counted as a requirement for a Major in Physics.

PHYC 2700.03: The Atmosphere.

See class description for OCEA 3000.03 in the Oceanography section of this calendar.

PHYC 3000.03: Experimental Physics I.

This class comprises PHYC 3340.03 plus a lab dealing with the measurement of a fundamental constant. The class introduces the student to electronics and measuring techniques. The student will design an experiment, do the measurements, and produce a report. Additional registration for PHYC 3340.03 is not necessary.

INSTRUCTOR: B.E. Paton

FORMAT: Lecture 3 hours, lab 6 hours

PREREQUISITES: PHYC 2000.03, 2005.03, 2010.03 and 2015.03.

PHYC 3010.03: Experimental Physics II.

Designed to give the students a chance to do non-set experiments and thereby encounter and solve the problems of experimentation. Original approaches by the students are encouraged. As the number of experiments is small (three) students should achieve a real understanding of a few physical phenomena. Lecture topics include a survey of experimental techniques as encountered in the different areas of physics.

INSTRUCTOR: D. Labrie

FORMAT: Lecture 3 hours, lab 6 hours

PREREQUISITE: PHYC 3000.03

PHYC 3090.03: 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: Staff

FORMAT: Lecture 3 hours

PREREQUISITE: MATH 2001.03/2002.03, MATH 2480.03/2490.03, PHYC 2005.03

PHYC 3140.03: Quantum Physics I.

The determination and interpretation of solutions to the one-dimensional Schrodinger equation is illustrated by simple examples. Dirac notation and the abstract formalism of quantum mechanics is introduced. The three-dimensional Schrodinger equation is discussed with special emphasis on the hydrogen atom. Electron spin is introduced.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PREREQUISITE: MATH 2000.06 or equivalent; PHYC 2015.03

***PHYC 3160.03: Topics In Physics.**

An introduction to thermodynamics and statistical mechanics.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PREREQUISITE: PHYC 2005.03, 2010.03

EXCLUSION: Credit will not be given for PHYC 3160.03 and either of PHYC 3200.03 or 3210.03.

PHYC 3170.03: Topics In Physics.

This class continues the application of quantum principles to various areas of modern physics begun in PHYC 2015.03. Quantum principles will be applied to atoms, molecules, solids and nuclei. Special topics will include lasers and X-ray diffraction, as well as topics in solid state physics, such as semiconductors, superconductors and superconducting devices.

INSTRUCTOR: J.G. Cordes

FORMAT: Lecture 3 hours

PREREQUISITE: PHYC 2015.03

PHYC 3200.03: Thermodynamics.

An introduction to the basic concepts and laws of classical thermodynamics. Topics include equations of state, heat engines, thermodynamic functions, and phase equilibrium. An introduction to statistical mechanics may be included.

INSTRUCTOR: P. Chylek

FORMAT: Lecture 3 hours

PREREQUISITES: Some knowledge of partial derivatives, e.g. MATH 2001.03/2002.03 or 2480.03/2490.03

PHYC 3210.03: 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

PREREQUISITES: PHYC 3200.03 or equivalent; MATH 2001.03/2002.03 or 2480.03/2490.03

***PHYC 3250.03: Computational Methods In Physics.**

Topics include an overview of numerical analysis, the use of symbolic computation packages with applications to the modelling of physical phenomena, and the treatment of experimental or theoretical data. Prior experience with computer programming languages is an advantage.

INSTRUCTOR: Staff

FORMAT: Lecture/lab 3 hours

PREREQUISITE: Completion of a second-year programme in physics, including MATH 2001.03/2002.03 or 2480.03/2490.03, or permission of the instructor.

PHYC 3340.03: Electronics.

Topics include digital electronics: logic gates, clocks, shift registers, counters, memory; analog electronics: R.C.L. circuits, operational amplifiers; electronic systems: A/D and D/A chips, computer chips, and displays.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: PHYC 2010.03; or ENGI 2230.03

***PHYC 3440.03: 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 2010.03; MATH 2001.03/2002.03 or 2480.03/2490.03; the student should be familiar with vector analysis, Maxwell's equations, and the use of complex exponential functions.

PHYC 3810.03: Microcomputers and the Real World.

Subject material: measurement theory, modern sensors, microcomputer architecture, 68000 family of computers, software simulation of digital electronic circuits, assembly and labVIEW programming, interfacing techniques including serial, parallel, Centronics, RS232 and IEEE.

INSTRUCTOR: B. E. Paton

FORMAT: Lecture 3 hours, computer lab 3 hours

PREREQUISITES: PHYC 2000.03/2010.03

CROSS-LISTING: COMP 3810.03

PHYC 4000.03: Advanced Lab.

This is a physics laboratory class in which students work largely on their own initiative. The student may select experiments from the fields of optics, acoustics, solid state devices, low temperature physics and other fields of contemporary interest. 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

PREREQUISITES: Fourth-year standing in physics or permission from the instructor.

PHYC 4100.03: 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

PREREQUISITES: PHYC 2010.03, 4160.03; MATH 3110.03/3120.03

CROSS-LISTING: PHYC 5100.03

PHYC 4151.03: Quantum Physics II.

This class is a continuation of PHYC 3140.03. Topics include: time-independent perturbation theory, the variational principle, the WKB approximation, time-dependent perturbation theory, scattering.

INSTRUCTOR: D. Kiang

FORMAT: Lecture 3 hours

PREREQUISITE: PHYC 3140.03

CROSS-LISTING: PHYC 5151.03

PHYC 4152.03: Quantum Physics III.

Selected topics from: angular momentum and tensor operators, many-body problem, symmetry and invariance, path integral approach and relativistic quantum mechanics.

INSTRUCTOR: D. Kiang

FORMAT: Lecture 3 hours

PREREQUISITES: PHYC 4151.03

CROSS-LISTING: PHYC 5152.03

PHYC 4160.03: 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

PREREQUISITES: MATH 3110.03/3120.03, or permission of instructor.

CROSS-LISTING: PHYC 5160.03

PHYC 4170.03: Topics in Mathematical Physics.

This class is a continuation of PHYC 4160.03 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: PHYC 4160.03 or permission of instructor

CROSS-LISTING: PHYC 5170.03

PHYC 4180.03: Nuclear and Particle Physics.

This is an introductory class in nuclear physics. Topics discussed include: nucleon-nucleon interactions, nuclear structure, gamma transitions, alpha decay, beta decay, nuclear reactions and elementary particle physics.

INSTRUCTOR: R.A. Dunlap

FORMAT: Lecture 3 hours

PREREQUISITE: PHYC 3140.03

CROSS-LISTING: PHYC 5180.03

PHYC 4230.03: 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: Staff

FORMAT: Lecture 3 hours

PREREQUISITE: PHYC 3140.03 or permission of instructor

CROSS-LISTING: PHYC 5230.03

PHYC 4311.03: Fluid Mechanics VII.

See class description for OCEA 4311.03/4312.03, in the Oceanography section of this calendar.

***PHYC 4411.03: Atmospheric Dynamics I.**

See class description for OCEA 4411.03 in the Oceanography section of this calendar.

***PHYC 4412.03: Atmospheric Dynamics II.**

See class description for OCEA 4412.03 in the Oceanography section of this calendar.

PHYC 4500.03: Atmospheric Physics I.

Main topics covered in this class are atmospheric thermodynamics and atmospheric radiation.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PREREQUISITES: At least one 3rd year physics class, preferably thermodynamics

CROSS-LISTING: OCEA 4500.03/5500.03, PHYC 5500.03

***PHYC 4510.03: 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: Staff

FORMAT: Lecture 3 hours

PREREQUISITE: PHYC 4500.03

CROSS-LISTING: OCEA 4510.03/5510.03, PHYC 5510.03

***PHYC 4515.03: Weather Briefing.**

See class description for OCEA 4515.03 in the Oceanography section of this calendar.

***PHYC 4520.03: Introduction to Atmospheric Science.**

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. Class participation will be encouraged by the use of discussions and seminars.

INSTRUCTOR: U. Lohmann

FORMAT: Lecture 3 hours

PREREQUISITE: Permission of instructor

CROSS-LISTING: OCEA 4520.03/5520.03, PHYC 5520.03

***PHYC 4540.03: 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: S. Miller

FORMAT: Lecture 2 hours, tutorial-lab 3 hours

PREREQUISITE: At least one third-year physics class

CROSS-LISTING: OCEA 4541.03/5541.03, PHYC 5540.03

***PHYC 4550.03: Synoptic Meteorology II.**

This class extends the analysis and diagnosis of atmospheric dynamics and weather processes introduced in PHYC 4540.03. 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: S. Miller

FORMAT: Lecture 2 hours, tutorial-lab 3 hours

PREREQUISITE: PHYC 4540.03

CROSS-LISTING: OCEA 4550.03/5550.03, PHYC 5550.03

***PHYC 4650.03: General Relativity.**

See class description for MATH 4650.03 in the Mathematics section of this calendar.

PHYC 4660.03: Cosmology.

See class description for MATH 4410.03 in the Mathematics section of this calendar.

PHYC 4800.03: Research Project.

All honours students will undertake a research project under the direction of an individual faculty advisor. Permission of the coordinator is required if this advisor is not a member of the Physics department. Interim progress reports and a formal final report are required. The class grade will be based on an evaluation of the reports.

COORDINATOR: D. Kiang

FORMAT: Independent research, typically 3 hours/week

PREREQUISITE: Honours student

PHYC 8891.00: Co-op Work-Term I

PHYC 8892.00: Co-op Work-Term II

PHYC 8893.00: Co-op Work-Term III

PHYC 8894.00: Co-op Work-Term IV

SCIE 3000.06: 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". This class may be taken as a general elective towards a degree in physics.

SCIE 8700.00: Co-op Seminar.

See class description in the Co-operative Education in Science section of this calendar

Physiology and Biophysics

Location: Str Charles Tupper Building, Third Floor
Halifax, NS B3H 4H7
Telephone: (902) 494-3517
Fax: (902) 494-1685

Dean

McIntyre, L., MD, MHSc, FRCP(C)

Head of Department

French, A.S.

Professors Emeritus

Issekutz, B., Jr., MD (Szeged), Dr Med (Bud)
MacLeod, E., MD (Dal)
Szerb, J.C., MD (Munich), FRCP(C)

Professors

Armour, J.A., BSc (McG), MD (Western), PhD (Loyola)
Croll, R.P., BSc (Tufts), PhD (McG)
Fine, A., AB (Harvard), VDM, PhD (Penn)
French, A.S., MSc, PhD (Essex)
Guernsey, D., BA (Lehigh), MS (Bridgeport), PhD (Hawaii), Major
appointment - Dept. of Pathology
Horacek, B.M., MSc(Eng) (Prague), PhD (Dal)
Horackova, M., MSc, PhD (Prague)
McDonald, T.F., BSc (Alta), PhD (Dal), DIC (Imperial College)
Meinertzhagen, L.A., BSc (Aberdeen), PhD (St. Andrews), Major
appointment - Dept. of Psychology
Moger, W.H., BS (Cornell), PhD (Calif)
Pelzer, D., MD (Heidelberg)
Rasmussen, D., BA (Colo C), MA, PhD (Dal), Graduate Studies
Coordinator
Wilkinson, M., BSc (Southampton), PhD (Lond), Major appointment
- Dept. of Obstetrics/Gynecology
Wolf, H., Dipl Ing (Munich), PhD (Dal)

Associate Professors

Brown, R.E., BSc (Victoria), MA, PhD (Dal), Major appointment -
Dept. of Psychology
Handa, S.P., MD (Punjab), FRCP(C), FACP
Kozey, C.L., BPE (UNB), MSc (Waterloo), PhD (Dal), major
appointment in School of Physiotherapy
Morgunov, N., BSc, MSc, PhD (Tor)
Murphy, M.G., BSc, MSc, PhD (Dal)
Murphy, P.R., MSc, PhD (Dal)
Pelzer, S., BSc, MSc, PhD (Frelburg)
Rittmaster, R., BA (Brown), MD (Tufts Med Sch), major appointment
Dept. of Medicine
Stroink, G., PhD (McG), Major appointment - Dept. of Physics

Assistant Professors

Chauhan, B., PhD (Wales), Major appointment - Dept. of Medicine
Gardner, M., MD (Dal), FRCP (C), FACC, Major appointment - Dept.
of Medicine
Landymore, K., BSc, MD, PhD (Dal), Major appointment - Dept. of
Obstetrics/Gynecology
Villarreal, A., BS, MS (Chile), PhD (UCLA)

Adjunct Professors

Hicks, T.P., Major appointment, Head, Division of Tissue
Regeneration Group, National Research Council, Ottawa

Martin, S., BA (MSVU), MSc (Alta), PhD (Calgary), Major
appointment, Professor, Dept. of Biology, Mount St. Vincent
University

Seyfarth, E.-A., Major appointment, Privatdozent, Zoological
Institute, J.W. Goethe University, Frankfurt am Main, Germany

Senior Instructor

Couture, C., BA (Dal)

I. Introduction

The Department of Physiology and Biophysics offers a wide range of undergraduate and graduate classes in addition to those restricted to students in the faculties of Medicine and Dentistry. The Department does not offer a specific Bachelor's degree programme (see the Graduate Studies Calendar for details on the Master and Doctorate degree programmes).

The classes listed below are aimed at providing the student with an understanding of the functioning of the human body. The broad survey classes (1010.06, 2030.06) are pitched at different levels. This meets the needs of students who require a specific level for their particular programme or for entry into a further degree programme. Students who are not in the Faculty of Health Professions are generally placed in the 2030.06 class. The Distance Education class C1000.06 is open to all students. Students wishing to enrol in other specialized classes require permission from the Course Director or Department Head.

Students who have previously taken biology, chemistry, physics and similar will be best equipped to study physiology.

II. Classes Offered

PHYL 1000.06: Human Physiology.

A full-credit Distance Education class equivalent to PHYL 1010.06 (a requirement of the Dalhousie BScN and other Health Professions degrees). The class is based on a selected textbook and study guide supported by an extensive student-friendly package including a step-by-step guide, learning objectives, supplementary material, mail-in assignments, and videotaped laboratories. The class is normally given in the Regular session (Sept - Apr), as well as in the Spring session (May - June). Distance Education classes have an additional, non-refundable, fee of \$100 over and above the listed tuition fees.

DIRECTOR: C. Couture

PHYL 1010.06: Human Physiology.

This is an introductory physiology class directed mainly at health professional students. The functions of body organs and body systems and the integration of functions in the whole organism are studied.

DIRECTOR: W. Moger

FORMAT: Lecture 3 hours, supplemented with tutorials

EXAMINATIONS: Two midterms 15% each, Christmas and Final 35% each, multiple choice format

PHYL 2030.06: Human Physiology.

The function of organs and body systems is presented through lectures and some laboratory work. Special emphasis is on the integration of function in the whole organism. A medium-level class directed at Health Professions students.

DIRECTOR: K. Landymore

FORMAT: Lecture; tutorial 10 hours; 4 labs

PREREQUISITE: Two classes from Biology, Physics, Chemistry

CO-REQUISITE: ANAT 2170.06 (applies to Physiotherapy students only)

PHYL 3110.03: Neurophysiology.

The student is provided with the principles of neurophysiology. Current concepts of the organization and function of the human nervous system are surveyed. The class is mainly directed at Physiotherapy and Occupational Therapy students.

DIRECTOR: R. Croll

FORMAT: Lecture/tutorial 4 hours

PREREQUISITES: PHYL 1010.06 or 2030.06, ANAT 2100.03

PHYL 3120.03: Exercise Physiology.

The short and long-term responses of different organ systems to physical exercise will be discussed and exercise in special patient groups will be analyzed. This class is mainly directed toward Physiotherapy and Occupational Therapy students.

DIRECTOR: H. Wolf

FORMAT: Lecture/lab 4 hours

PREREQUISITE: PHYL 1010.06 or 2030.06 or equivalent

PHYL 4321.06: Human Cell Physiology.

This class examines fundamental physiological concepts at the cellular/molecular level. The topics include cell surface receptors and transporters, intracellular and intercellular communication, signal transduction and regulation/integration of epithelial transport systems. This class is primarily directed to fourth year honours science students and graduate students.

NOTE: PHYL 4321.06 can be taken for credit in an Honours BSc programme.

DIRECTOR: N.S. Morgunov

FORMAT: Lecture 2 hours, tutorial 1 hour, computer lab 2 hours

PREREQUISITE: PHYL 2030.06 or BIOL 3070.06 or permission of the class director

CROSS-LISTING: BIOL 4321.06

PHYL 4323.03: Human Physiology: The Mechanisms of Body Functions.

This class covers the physiology of human organ systems including neurophysiology, cardiovascular, respiratory, renal, gastrointestinal and endocrine physiology. In addition to lectures there will be in-depth discussions and analyses of current topics as they apply to the organ systems. This class is mainly directed toward fourth year Honours science students and graduate students.

DIRECTOR: M. Horackova

FORMAT: Lectures (38 hours) supplemented with tutorials

EXAMINATIONS: Two written examinations (mid-term and final 50% each)

PREREQUISITE: Approval of the Class Director

Physiotherapy

School of Physiotherapy

Location: 5869 University Avenue
Forrest Building, Fourth Floor
Halifax, NS B3H 3J5

Telephone: (902) 494-2524

Fax: (902) 494-1941

E-mail: physiotherapy@dal.ca

Dean

McIntyre, L., MD, MHSc, FRCP(C)

Director

Makrides, L., MCSP, BPT (Saak), MSc (Ottawa), PhD (McM)

Faculty Advisors

Fenety, A. (Undergraduate Co-ordinator)

Jamieson, F. (Academic Clinical Education Co-ordinator)

Academic Staff

Professors

Egan, D.A., MCSP, DipTP, MSc (Western), PhD (Curtin)

Makrides, L., MCSP, BPT (Saak), MSc (Ottawa), PhD (McM) (cross-appointment with School of Health & Human Performance; Department of Community Health & Epidemiology)

Turnbull, G.L., MCSP, DipTP, BPT (Man), MA (Dal), PhD (Rhodes) (cross-appointment with School of Health & Human Performance)

Associate Professors

Kozey, C.L., BPE (UNB) MSc (Waterloo), PhD (Dal) (cross-appointment with Department of Physiology & Biophysics; School of Health & Human Performance)

Assistant Professors

Earl, M., BSc (Kin) (Waterloo), BSc (PT) (Western), MSc (Waterloo), PhD (Waterloo) (cross-appointment with School of Health & Human Performance)

Fenety, A., BSc (UNB), DipPT (Man), MScPT (Alberta), PhD (Dal)

MacKay-Lyons, M., BSc (PT) (Tor), MScPT (USC)

Lecturer

Jamieson, F., MCSP

Wainwright, G., BSR (UBC)

Adjunct Appointments

Hill, K.C.W., MCSP, DipTP, MSc (Dal), Associate Professor

Cross Appointments

Dechman, G.S., BSc (PT) (Queen's), PhD (McGill), Centre Director, Kuwait-Dalhousie Project

Marble, A.E., BEng (Hons), MASc, PhD (TUNIS), Associate Professor, Department of Surgery

Murray, T.J., MD, FRCP (C) Professor, Department of Medicine

Putnam, C.A., BPE (Man), MS (Wash), PhD (Iowa), Associate Professor

Stanish, W.D., MD, FRCS (C), Associate Professor, Department of Surgery

Stewart, R.D., BA, BSc (Acadia), MD (Dal), DSc (Hon) (Acadia), Professor, Anaesthesia (Emergency Medicine)

Special Lecturers

Brien, J., BSc (PT) (Dal)
Carr, C., BSc (PT) (Dal) ACSM (Exercise Specialist)
Dick, S., BSc (UWO), BSc (PT) (Uof T), MSc (Uof T)
O'Brien, M., BSc (PT) (Dal)

Adjunct Associate Professor

Wall, J.C., BSc (Lond), MSc (Surrey), MEd (Tor), PhD (Lond)

Provincial Clinical Co-ordinators

Dubé-Wybenga, P., Clinical Placement Administrator, New Brunswick

O'Dea, J., BSc (PT) (McG) Newfoundland

Jardine, M., BSc (PT) (McG) PEI

Roussel, M., Programme Coordinator, New Brunswick

Regional Facilities Associated with the Clinical Education Programme

Nova Scotia

Aberdeen Hospital, New Glasgow
Acadia Sports Therapy Clinic, Wolfville
All Saint's Springhill Hospital, Springhill
Beaverbank Physiotherapy, Lower Sackville
Bedford-Sackville Physiotherapy Clinic, Lower Sackville
Canadian Back Institute, Halifax
Canadian Forces Hospital (Renova), Halifax
Cape Breton Regional Hospital, Sydney
Clare Physiotherapy, Saulnierville
Cobequid Multi-Service Centre, Lr. Sackville
Cobequid Physiotherapy Clinic, Lr. Sackville
Colchester Regional Hospital, Truro
Cowie Hill Physiotherapy, Halifax
CPRRC, Halifax
Dartmouth General Hospital, Dartmouth
Digby General Hospital, Digby
Fisherman's Memorial Hospital, Lunenburg
Glace Bay Integrated Health Care, Glace Bay
Halifax Physiotherapy and Sports Injuries Clinic, Halifax
Highland View Regional Hospital, Amherst
IWK/Grace Hospital, Halifax
King's Physiotherapy Clinic, New Minas
McIntyre Physiotherapy, New Glasgow
New Waterford Consolidated Hospital, New Waterford
Northside Harbour View Hospital, Sydney Mines
Northwood Care Inc., Halifax
Physiotherapy Atlantic, Halifax/Dartmouth/New Glasgow
Queen Elizabeth II Health Sciences Centre, Halifax
Queen's General Hospital, Liverpool
Regional Residential Services, Dartmouth
Renova Physiotherapy Clinic, Bedford
Shelburne County Health Centre, Shelburne
Soldiers Memorial Hospital, Middleton
South Shore Regional Hospital, Bridgewater
Southend Physiotherapy Clinic, Halifax
St. Martha's Hospital, Antigonish
St. Mary's Sports Medicine Centre, Halifax
St. Vincent Guest House, Halifax
Sutherland Harris Memorial, Pictou
The Arthritis Society, Halifax
The Physioclinic, Bridgewater
Valley Regional Hospital, Kentville
Western King's Memorial, Berwick
Yarmouth Regional Health Centre, Yarmouth

New Brunswick

Bouctouche Physiotherapy, Bouctouche
Broad Road Physical Therapy, Ormoco
Fredericton Physiotherapy, Fredericton
Fundy Physiotherapy, Rothesay
Mt. St. Joseph Nursing Home, Miramichi
Physiotherapy Moncton, Moncton
Renova/Mount Pleasant Physiotherapy, Saint John
Work Ready Professional Corporation, Saint John

Region 1 (Southeast) Hospital Corporation
Extra-Mural Program, Discoll Unit, Moncton
Moncton Hospital, Moncton
Sackville Memorial Hospital, Sackville

Region 1 (Beausejour) Hospital Corporation
Georges L. Dumont Hospital, Moncton
Hospital Stella Matis de Kéat Ste-Anne de Kéat

Region 2 Hospital Corporation
Charlotte County Hospital, St. Stephen
Extra-Mural Programs: Kennebecasis Unit - Quispamsis, St. John
Unit - Saint John, St. Stephen Unit - St. Stephen, Sussex Unit -
Sussex
Fundy Hospital Association, Black's Harbour
Saint John Regional Hospital, Saint John
St. Josephs Hospital, Saint John
Sussex Health Centre, Sussex

Region 3 Hospital Corporation
Carleton Memorial Hospital, Woodstock
Dr. Everett Chalmers Hospital, Fredericton
Extra-Mural Programs: Fredericton Unit - Fredericton, Oromocto
Unit - Oromocto, Woodstock Unit - Woodstock
Hotel Dieu St. Joseph, Perth Andover
Oromocto Public Hospital, Oromocto
Queens North Health Complex Inc., Minto
Stan Cassidy Centre for Rehabilitation, Fredericton

Region 4 Hospital Corporation
Edmundston Regional Hospital, Edmundston
Extra-Mural Programs: Unite d'Edmunston - Edmunston, Unite de
Grand-Sault - Grand-Sault
Grand Falls General Hospital, Grand Falls

Region 5 Hospital Corporation
Campbellton Regional Hospital, Campbellton
Extra-Mural Program: Restigouche Unit - Dalhousie

Region 6 Hospital Corporation (Reseau Sante Nor'est Health
Network)
Bathurst Regional Hospital, Bathurst
Hopital Infant-Jesus, Caraquet
Lameque Hospital, Lameque
Tracadie Hospital, Tracadie

Region 7 Hospital Corporation
Extra-Mural Program: Miramichi Unit - Newcastle
Miramichi Regional Hospital, Miramichi
Workplace Health, Safety and Compensation Commission, Saint
John

Newfoundland

Avalon Health Care Institutions, Carbonear
Aware Physiotherapy Clinic, Corner Brook
Central Newfoundland Regional Health Care, Grand Falls
Commonwealth Physiotherapy Clinic, Mt. Pearl
Community Health - St. John's Region, St. John's
Green Bay Health Care Centre, Springdale
Grenfell General Health Services (Charles S. Curtis Memorial
Hospital), St. Anthony
Health Care Corporation of St. John's (The General Hospital), St.
John's
Health Care Corporation of St. John's (Leonard Miller Centre), St.
John's
Health Care Corporation of St. John's (Dr. Janeway Child Health
Centre), St. John's
Health Care Corporation of St. John's (St. Clare's Mercy Hospital),
St. John's
Health Labrador Corporation (Capt. Wm. Jackman Memorial
Hospital), Labrador City
Health Labrador Corporation (Melville Hospital), Goose Bay
Hoyles-Escasoni Complex, St. John's
James Paton Memorial Hospital, Gander
Nova Physiotherapy, St. John's

Peninsulas Health Care Corporation (Bonavista Peninsula Health Care), Bonavista
Peninsulas Health Care Corporation (Burin Peninsula Health Care Centre), Busin
Peninsulas Health Care Corporation (G.B. Cross Memorial Hospital), Clarenville
Physiotherapy Associates, St. John's
Salvation Army Grace Hospital, St. John's
Therapeutic Services, St. John's
Western Health Care Corporation (Dr. Charles LeGrow Health Centre), Port-aux-Basques
Western Health Care Corporation (Sir Thomas Roddick Hospital), Stephenville
Western Health Care Corporation, Corner Brook
West Coast Physiotherapy Clinic, Corner Brook

Prince Edward Island
Cavendish Farms, Kensington
Charlottetown Physiotherapy and Rehabilitation Centre, Charlottetown
Island Physiotherapy, Charlottetown
Kings County Memorial Hospital, Montague
Prince County Hospital, Summerside
Prince Edward Home, Charlottetown
Queen Elizabeth Hospital, Charlottetown
Sports Centre Physiotherapy, Charlottetown
Summerside Physiotherapy Clinic, Summerside
Western Hospital, Alberton

Overseas Facilities Affiliated with Clinical Education Programme
Glasgow Royal Infirmary, Scotland
Royal Infirmary, Edinburgh
Karolinska Institutet, Sweden
Ninewells Hospital, Dundee, Scotland

I. 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 offers non-credit workshops and seminars as part of a continuing education programme for graduates in Physiotherapy.

A. 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, in the U.K. and U.S.A.

B. 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 practise 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 elsewhere. 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.

C. 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. Dalhousie offers a graduate programme (MSc) in Physiotherapy. As well, there are appointments for graduate work in Physiotherapy in other Canadian Universities.

D. 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 fulfill 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.

E. 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.

F. Association Membership

Information regarding membership in the various Physiotherapy Associations can be obtained from the following sources: The Canadian Physiotherapy Association (2345 Yonge St., Suite 410, Toronto, Ontario, M4P 2E5); 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 Eastcastle Street, London, W1N 7PA, England); The Canadian University Service Overseas, (CUSO) (151 Slater Street, Ottawa, Ontario, K1P 5H5).

G. 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.

H. 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.

I. 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.

J. Grading System

In classes where professional skill acquisition and competence are required (PHYT 2102.06, 2041.03, 2500.00, 3000.03, 3010.04, 3020.03, 3030.04, 3055.03, 3065.04, 3500.06, 4070.03, 4071.03, 4072.03, 4073.03, 4074.03, 4500.06), the minimum passing grade will be a C. For classes which have distinct sections (PHYT 3020.03, 4070.03, 4072.03), each section must be passed with a minimum grade of C. In all other classes the passing grade is D.

K. Grade Point Average Requirements

The grade point average system is described in the Academic Regulations.

L. Voluntary Withdrawal

Students who voluntarily withdraw from the School of Physiotherapy, having satisfactorily completed classes 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.

M. 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.

II. 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 prerequisite 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, or their equivalent, comprising two science classes (Physics plus Chemistry or Biology), one social science class (Psychology, or Sociology or Social Anthropology), Statistics (1060.03) and 1½ electives (one credit (1.0) must fulfill a writing requirement). All prerequisite classes must be completed by the end of the normal academic year preceding the year of anticipated admission to the School of Physiotherapy.

The pre-requisite first year classes at Dalhousie University are as follows: Physics plus Chemistry or Biology. Acceptable classes are: CHEM 1010.06, 1020.06, 1030.06, 1040.06; BIOL 1000.06 or 1001.06; PHYC 1100.06 or 1300.06. One class from Psychology or Sociology and Social Anthropology. Acceptable Dalhousie University classes are PSYO 1000.06 or 1010.06 or 1500.06; SOSA 1000.06 or 1050.06 or 1100.06 or 1200.06. Statistics 1060.03 plus 1½ electives (one credit (1.0) must fulfill a writing requirement).

Students studying at Universities other than Dalhousie are requested to ensure that the pre-requisite classes they are taking are equivalent to the classes 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 2.00 in each of the final three years of study and an overall final GPA of at least 2.00. Additionally, promotion to the fourth year of study is contingent upon a satisfactory clinical report with regard to the summer clinical placement between the third and fourth years of study (PHYT 3501.06).

Faculty of Health Professions Required Classes

Year II

- ANAT 2100.03
- ANAT 2160.03
- ANAT 2170.06
- PHYL 2030.06
- PHYT 2022.03
- PHYT 2041.03
- PHYT 2051.03
- PHYT 2070.02
- PHYT 2080.01
- PHYT 2102.06
- PHYT 2500.00
- Five-week summer clinical orientation

Year III

- KINE 1230.03
- PHYL 3110.03
- PHYL 3120.03
- PHYT 3000.03
- PHYT 3010.04
- PHYT 3020.03
- PHYT 3030.04
- PHYT 3055.03
- PHYT 3065.04
- PHYT 3501.06
- PSYO 2220.03
- Three hours of electives

Year IV

- COMM 2001.03
- PHYT 4022.03
- PHYT 4070.03
- PHYT 4071.03
- PHYT 4072.03
- PHYT 4073.03
- PHYT 4074.03
- PHYT 4500.06
- Health elective (3 hours) or PHYT 4075.03
- Six hours of electives

Electives

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.

The health elective is intended to enhance or broaden students' health perspectives. Acceptable topics include, but are not necessarily limited to: prevention or treatment of human illness, disease or injury; health promotion; wellness; health needs of defined populations; health administration, policy, or ethics; drugs and health; legal and political aspects of health; socio-cultural attitudes in health; health education; and nutrition. The content of health electives must not overlap with existing courses in the physiotherapy curriculum nor focus on a basic science related to health.

NOTE: All electives must be approved by the School of Physiotherapy.

Clinical Practicum

After the second year, students engage in a five-week clinical placement (May/Aug). 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 fifteen weeks between the third and fourth years (PHYT 3501.06). Students who fail a section of the third year clinical class (PHYT 3501.06) will be allowed to enter year four (academic), but must repeat the failed third year clinical section after completing B term of the fourth year and before doing any fourth year clinical practicum (PHYT 4500.06). Such students will not normally graduate in May.

A compulsory period of clinical practice of 10 weeks (PHYT 4500.06) 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 New Brunswick, 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.

III. Classes Offered

Year II Required Classes

ANAT 2100.03: Neuroanatomy.

A class in Neuroanatomy offered by the Department of Anatomy and Neurobiology. See class description in the Anatomy and Neurobiology section of this calendar.

INSTRUCTOR: H. Ellenberger/F. Smith

FORMAT: Lecture/lab 3 hours

PREREQUISITE: ANAT 2160.03

CO-REQUISITE: ANAT 2170.06

ANAT 2160.03: Human Histology.

A histology class for physiotherapy students covering cells, tissues, and selected organs.

INSTRUCTOR: H. Dickson

FORMAT: Lecture 2 hours/lab 3 hours

CO-REQUISITE: ANAT 2170.06

ANAT 2170.06: Gross Anatomy.

The gross structure of the human body is studied region by region through the use of lectures, dissection and demonstrations in Radiological Anatomy. See class description in the Anatomy and Neurobiology section of this calendar.

INSTRUCTOR: R.W. Currie, R.J. Wassersug

FORMAT: Lecture/lab 7 hours

PREREQUISITE: Admission to School

PHYL 2030.06: Human Physiology.

See class description in the Physiology and Biophysics section of this calendar.

PHYT 2022.03: Research Methods.

This class is designed to enable students to be critical consumers of health care research. Research methodology for critical review of the literature is covered.

INSTRUCTOR: TBA

FORMAT: Lecture 3 hours

PHYT 2041.03 Therapeutic Exercise.

This class will provide students with the opportunity to begin applying knowledge of anatomy and principles of exercise physiology and kinesiology in designing programmes of therapeutic exercise. Basic techniques of joint mobilization, strengthening, endurance training and hydrotherapy will be introduced and incorporated into the development of exercise programmes appropriate for specific case scenarios.

INSTRUCTOR: M. MacKay-Lyons

FORMAT: Lecture/tutorial 3 hours, lab 3 hours

PREREQUISITE: PHYT 2051.03

CO-REQUISITE: ANAT 2170.06, PHYT 2102.06

PHYT 2051.03: Kinesiology.

This class 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. Kozey

FORMAT: Lecture 3 hours, lab

CO-REQUISITE: ANAT 2170.06

PHYT 2070.02: Microbiology.

An introductory class in Microbiology offered by the Department of Microbiology and Immunology within the Faculty of Medicine. See class description for MICR 2020.03 in the Microbiology and Immunology section of this calendar.

INSTRUCTOR: S.H.S. Lee

FORMAT: Lecture 3 hours

CROSS-LISTING: MICR 2020.03

PHYT 2080.01: 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: Lecture 1 hr

PHYT 2102.06: Clinical Foundations in Physiotherapy.

This class will give students the opportunity to acquire the knowledge and develop the skills and competencies needed to begin their clinical placements. The class is divided into five sections: Professional Issues, Communication and Professional Decorum, Basic Clinical Skills Introduction to Electrotherapy, and Clinical Measurement. Emphasis is on assisting students to critically analyze clinical scenarios and case studies to foster independent clinical reasoning.

INSTRUCTOR: M. MacKay-Lyons

FORMAT: Lecture/tutorial 3 hours, lab 3 hours

CO-REQUISITE: ANAT 2170.06

PHYT 2500.00: Clinical Practice.

This class will prepare the student for clinical practice and provide a clinical practice experience at the end of Year II. The student will be introduced to the practice of physiotherapy and provided with an opportunity to initially observe and then to implement basic physiotherapy assessment and treatment skills. The class will aid the student in the development of professional conduct and interpersonal relationships with staff and patients. The student will be exposed to the practice of physiotherapy as one element of Health Care in the Facilities. The last day to withdraw for this class, without a 'W', is five (5) days after commencement of placement.

INSTRUCTOR: F. Jamieson

FORMAT: Minimum 1 class per month, one five-week clinical placement is undertaken either in May or August

PREREQUISITE: Successful completion of the Year II, Academic Programme

Year III Required Classes

KINE 1230.03: Human Growth & Development.

See class description in the Health and Human Performance section of this calendar.

PHYL 3110.03: Neurophysiology.

See class description in the Physiology and Biophysics section of this calendar.

PHYL 3120.03: Exercise Physiology.

See class description in the Physiology and Biophysics section of this calendar.

PHYT 3000.03: Assessment.

This class 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 hours

PREREQUISITE: Successful completion of the Year II, BSc(PT) course of study and 4 weeks of clinical orientation.

PHYT 3010.04: Clinical Therapeutics I - Orthopaedic Conditions.

This class will provide the student with an overview of common orthopaedic conditions and their medical/surgical and physiotherapeutic management.

INSTRUCTOR: A. Fenety

FORMAT: Lecture, lab, seminar

PREREQUISITE: Successful completion of the Year II BSc(PT) course of study and 4 weeks of clinical orientation.

PHYT 3020.03: Clinical Therapeutics III - Rheumatology/ Amputations.

This class is designed to enable the student to acquire the knowledge and skills necessary for the assessment and management of clients with arthritis, and the rehabilitation of patients with amputations.

INSTRUCTORS: TBA

FORMAT: Lecture/lab 5 hours

PREREQUISITE: Successful completion of the Year II BSc(PT) course of study and 4 weeks of clinical orientation

PHYT 3030.04: Clinical Therapeutics IV - Neurological Conditions.

This class 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: G. Turnbull

FORMAT: Lecture 3 hours, lab 6 hours

PREREQUISITE: Successful completion of the Year II BSc(PT) course of study and 4 weeks of clinical orientation

PHYT 3055.03: Respiratory Conditions.

The purpose of this class is to enable the student to acquire the knowledge and skills necessary for the assessment and management of patients with respiratory conditions. At the completion of the class the student will be able to outline the pathophysiology of major respiratory conditions, apply knowledge of normal and abnormal lung physiology to assessment and treatment plan, and effectively carry out and evaluate the treatment of a respiratory patient.

INSTRUCTOR: TBA

FORMAT: Lecture/tutorial 3 hours, lab 2 hours

PREREQUISITE: Successful completion of Year II BSc (PT) programme of study and clinical practice.

PHYT 3065.04: Electrophysical Agents.

This class is designed to enable the student to acquire the skills and knowledge required to apply electrophysical modalities appropriately. A variety of electromagnetic, physical and phototherapeutic agents will be introduced. The applied physics

and physiological effects of each modality will be used as the basis for developing safe and effective application techniques and procedures.

INSTRUCTOR: M. Earl

FORMAT: Lecture/tutorial 4 hours, lab 3 hour

PREREQUISITE: Successful completion of the Year II BSc(PT) course of study and 4 weeks of clinical practicum

PHYT 3501.06: Clinical Practice.

This class will prepare the student for clinical practice and provide clinical practice experience at the end of Year III. The student will be given the opportunity, in a clinical setting, to apply the knowledge and skills which s/he acquired in the academic setting; to practice a problem-solving approach, thus justifying the assessment and treatment methods chosen; to acquire additional clinical skills which may not have been addressed in the academic setting; to experience the application of institutional procedures and policies; to develop appropriate professional attitudes and behaviours; to develop appropriate written and verbal communication skills with clinical personnel and patient/clients. The last day to withdraw from this class, without a 'W', is five (5) days after commencement of placement.

INSTRUCTOR: F. Jamieson

FORMAT: Minimum 1 class per month; one 5-week placement in each of the three practice areas: Orthopaedics, Neurology, Respiratory.

PREREQUISITE: Successful completion of Year III Academic Programme and PHYT 2500.00

PSYO 2220.03: Abnormal Behaviour.

See class description in the Psychology section of this calendar.

Year IV Required Classes

COMM 2001.03: Introduction to Business.

See class description in the Commerce section of this calendar.

PHYT 4022.03: Research Methods.

This class familiarizes students with the research process through the undertaking of a research project.

COORDINATOR: Staff

FORMAT: Few scheduled sessions, work with faculty advisor.

PREREQUISITE: PHYT 2022.03

PHYT 4070.03: Clinical Therapeutics V - Part I.

The purpose of this class is to further develop the ability to formulate and implement a reasoned physiotherapy management plan for patients with a variety of musculoskeletal problems. The class 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.

INSTRUCTOR: D. Egan

FORMAT: Lecture 2 hours, lab 3 hours

PREREQUISITE: Successful completion of Year III BSc(PT) programme of study and clinical practicum

PHYT 4071.03: Clinical Therapeutics V - Part II.

This class builds on knowledge and experience gained in PHYT 3030.04. The purpose of this class is to further develop the ability to formulate and implement a reasoned physiotherapy management plan, in the specific area of neurology. The class aims to further develop expertise in patient assessment and management in these areas by expansion of knowledge and skills related to etiology, mechanisms pathophysiology, assessment, treatment and other health care procedures.

INSTRUCTOR: G. Turnbull

FORMAT: Lecture 2 hours, lab 3 hours

PREREQUISITE: Successful completion of Year III BSc(PT) programme of study and clinical practicum

PHYT 4072.03: 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 concerns.

COORDINATOR: TBA

FORMAT: Lecture/seminar 4 hours, lab 2 hours

PREREQUISITES: Successful completion of Year III BSc (PT) programme of study and clinical practicums

PHYT 4073.03: Cardiac Rehabilitation Part IV.

This class will introduce the students to the assessment and management of participants in a cardiac rehabilitation setting. At the completion of the class, students will be able to describe the pathophysiology of coronary heart disease, interpret a progressive incremental exercise test, design an appropriate exercise and risk factor modification programme, evaluate the cardiovascular response to exercise and conditioning and apply scientific principles in the management of patients with coronary heart disease. Emphasis will be placed on the practical application of knowledge through clinical case studies.

INSTRUCTOR: L. Makrides

FORMAT: Lecture 2 hours, lab 2 hours

PREREQUISITE: Successful completion of Year III BSc (PT) programme of study and clinical practice

PHYT 4074.03: Case Management Seminar.

This class provides an opportunity for students to develop clinical problem solving and case management skills. Seminar discussions will address the therapeutic management of clinical cases incorporating a variety of physical, social, emotional and ethical concerns for patients across the life cycle.

COORDINATOR: M. Earl

FORMAT: Tutorial/seminar 3 hours

PREREQUISITE: Successful completion of the Year III BSc (PT) of study and clinical practicums

PHYT 4075.03: 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.

COORDINATOR: D. Egan

FORMAT: Independent study- no scheduled hours

RESTRICTION: Restricted to 4th year physiotherapy students

PHYT 4500.06: Clinical Practice.

This class will prepare the student for clinical practice and provide clinical practice experience during and at the end of Year IV. The student will gain experience in clinical procedures, interpersonal relationships with staff and patients/clients and develop appropriate professional attitudes and behaviours. The student will have the opportunity in a clinical setting to integrate and apply knowledge and skills acquired in the academic setting; to develop and enhance previously acquired clinical capabilities in complex situations; to acquire additional necessary clinical capabilities which may not have been addressed in the academic setting; to resolve clinical problems and justify the assessment and treatment methods chosen. The last day to withdraw from this class, without a 'W', is five (5) days after commencement of placement.

INSTRUCTOR: F. Jamieson

FORMAT: Minimum 1 class per month, 2 five-week placements with the emphasis on community based practice. Clinical areas will include geriatrics, paediatrics, private practice, cardiac rehabilitation, home care, industry or any area that builds upon the Year III experience.

PREREQUISITE: Successful completion of PHYT 3501.06 AND Year IV Academic Programme

Elective Classes (See Electives under Faculty of Health Professions Required Classes)

HLTH 3000.03: An Interdisciplinary Approach to Health Promotion.

See class description in Health Professions, Interdisciplinary section of this calendar.

HLTH 4900.03/4910.03: Interdisciplinary Approach to Gerontology.

See class descriptions in the Health Professions, Interdisciplinary section of this calendar.

PHYT 3070.03/3080.03/4075.03: 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.

COORDINATOR: D. Egan

FORMAT: Independent study - no scheduled hours

RESTRICTION: PHYT 3070.03/3080.03 is restricted to third and fourth year physiotherapy students. PHYT 4075.03 is restricted to fourth year physiotherapy students.

PHYT 3090.03: Interdisciplinary Class in Human Nutrition.

See class description for NURS 4800.03 in the Nursing section of this calendar.

RESTRICTION: Restricted to physiotherapy students

Political Science

Location: Arts and Administration Building
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Telephone: (902) 494-2396
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Dean

Taylor, G.D., BA, PhD (Penn)

Chair

Cameron, D.M. (Room 301B, 494-6626, e-mail: David.Cameron@Dal.ca)

Undergraduate Advisors

Honours:

Stairs, D. (Room 356, 494-6604, e-mail: Denis.Stairs@Dal.ca)

Majors and Advanced Majors:

Fierlbeck, K. (Room 362, 494-6631, e-mail: K.Fierlbeck@Dal.ca)

Professors Emeriti

Beck, J.M., BA (Acadia), MA, PhD (Tor), LLD (Dal), LLD (StFX), LLD (RMC), FRSC

Borgese, E.M., OC, DipMus (Zurich), LHD (MSVU)

Braybrooke, D., BA (Harv), MA, PhD (Corn), FRSC

Bayrs, J.G., OC, BA (Tor), AM, PhD (Col), FRSC

Professors

Aucoin, P.C., BA (SMU), MA (Dal), PhD (Queen's) (McCulloch Professor in Political Science)

Bakvis, H., BA (Queen's), MA, PhD (UBC)

Boardman, R., BSc, PhD (Lond) (McCulloch Professor in Political Science)

Cameron, D.M., BA (Queen's), MA, MPhil, PhD (Tor)

MacFarlane, S.N., AB (Dartmouth), MA, MPhil, DPhil (Oxford), (Lester B. Pearson Chair in International Relations)

Middlemiss, D.W., BA, MA, PhD (Tor)

Shaw, T.W., BA (Sussex), MA (East Africa, Prin.), PhD (Prin), (Director, Centre for Foreign Policy Studies)

Stairs, D.W., BA (Dal), MA (Oxon), PhD (Tor) FRSC (McCulloch Professor in Political Science)

Winham, G.R., BA (Bowdoin), Dip. in Int. Law (Manc), PhD (NorthCar), FRSC (Eric Dennis Memorial Professor of Government and Political Science)

Associate Professors

Fierlbeck, K., BA (Alta), MA (York), PhD (Cantab)

Harvey, F., BA, MA, PhD (McGill)

Smith, J., BA (McM), MA, PhD (Dal)

Finbow, R.G., BA (Dal), MA (York), MSc, PhD (London)

Assistant Professors

Black, D.R., BA (Trent), MA, PhD (Dal)

Carbert, L., BA (Alta), MA, PhD (York)

Research Associate

Crickard, F.W., BA, MA (Dal), (R-Adm., Ret'd)

I. 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 philosophers; 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 Fierlbeck, the Undergraduate Advisor, in developing a programme of studies. Students taking an Honours Degree should seek advice from Professor Denis Stairs, Honours Coordinator. Professor Robert Finbow 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 POLI 1100.06 (various sections), and POLI 1103.06 (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.

PLEASE NOTE: Students who complete the King's Foundation Year Programme with a grade of "B" or higher will not be required to complete an Introductory class in Political Science (POLI 1100.06).

II. 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 consist of a general selection of classes from the Department's offerings or may emphasize one of the sub-fields of Political Science. In detail, these include:

Introductory

- POLI 1100.06, 1103.06

Canadian Government and Politics

- POLI 2200.06
- POLI 3205.03, 3206.03, 3212.03, 3216.03, 3220.03, 3224.03, 3233.03, 3235.03, 3245.03, 3251.06
- POLI 4228.03, 4240.03, 4241.03

Comparative Government and Politics

- POLI 2300.06
- POLI 3302.03, 3303.03, 3304.03, 3311.03, 3315.03, 3325.06, 3360.03, 3379.06

Political Theory and Methodology

- POLI 2400.06
- POLI 3427.03, 3428.03, 3430.03, 3431.03, 3435.03, 3445.03, 3475.03, 3492.03, 3493.03
- POLI 4479.03, 4480.03, 4496.03

International Politics and Foreign Policy

- POLI 2500.06, 2510.06, 2512.06
- POLI 3525.03, 3531.03, 3535.03, 3537.06, 3540.03, 3544.03, 3550.03, 3570.06, 3571.06, 3574.03, 3575.03, 3581.03, 3585.03, 3589.03, 3591.03, 3596.03, 3601.06, 3602.03, 3603.03
- POLI 4636.03

A. 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.

Any exceptions to the requirements stipulated below can only be obtained through written petition to the Undergraduate Committee, which reserves the authority to determine admission into the Honours programme in these cases.

Core Classes

For the purpose of the honours programme the Department has designated four second-year classes as honours core classes. These core classes represent the political science sub-fields of Canadian politics, comparative politics, political philosophy and international politics. The core classes by area are as follows:

- POLI 2200.06: Canadian Government and Politics
- POLI 2300.06: Comparative Politics
- POLI 2400.06: Foundations of Political Thought
- POLI 2500.06: World Politics

Departmental Requirements

2000 level

- Three core classes, one of which must be POLI 2400.06
- Four other Political Science credits at or above the 2000 level not including those listed below

3000 level

- POLI 3492.03
- POLI 3493.03

4000 level

- POLI 4600.06

To gain admittance into the Honours programme, students must have:

- B average in their last ten credits
- B+ average in a group of four Political Science classes, which must include:
 - Two core classes (one of which is POLI 2400.06)
 - POLI 3492.03 and 3493.03
 - One full credit at the 3000-level in Political Science

Students should sign into the Honours programme at the end of their third year.

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.

In their fourth year, honours students may petition to take a graduate seminar class. These are the core classes for graduate students and correspond to the same four areas of study within Political Science as the second-year honours core classes.

This provides fourth-year honours students with the opportunity to work with graduate students at an advanced level. Honours students will be admitted to the graduate core class in the field in which they intend to write their honours essay.

The core graduate seminars by area are as follows:

- POLI 5204.06: Advanced Seminar in Canadian Politics
- POLI 5301.03: Comparative Theory or POLI 5340.03: Approaches to Development
- POLI 5400.03: Advanced Seminar in Political Theory
- POLI 5520.06: Theories of International Relations

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 POLI 4600.06. 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. Honours students will also be expected to participate in the Honours Seminar, which will count toward the "21st" grade required by the University.

B. Combined Honours

PLEASE NOTE: Be sure to read the Faculty of Arts and Social Sciences requirements for the Combined Honours Programme listed in the Degree Requirements section of this Calendar.

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.

To obtain a Combined Honours, with an emphasis upon Political Science, students must have

- Two core classes in Political Science, one of which is POLI 2400.06 (NOTE: The prerequisite for these classes is an introductory class in Political Science);
- A methods class in one of the two fields (e.g. POLI 3492.03 and 3493.03, or a Methods class in another field);
- At least two full credits at an advanced level in Political Science (in addition to 3492.03 and 3493.03); and
- POLI 4600.06

To gain admittance into the Combined Honours programme, with an emphasis upon Political Science, students must have a B+ average in a group of three Political Science classes comprised of two core classes (one of which is 2400.06) and 3492.03 and 3493.03.

Students who take a combined Honours, with an emphasis on a subject OTHER than Political Science, must take a minimum of

- One core class in Political Science (note that the prerequisite for core classes is an introductory class in Political Science);
- One full credit in a methods class (either in Political Science or in another field);
- One full credit in Political Science at an advanced level; and
- One other full-credit Political Science class beyond the 1000-level.

To gain admittance into the Combined Honours programme, with an emphasis upon a subject OTHER than Political Science, students must have a B+ average in a group of two Political Science classes, including a core class.

C. Advanced Major Programme

The Advanced Major Programme offers the opportunity for students to design a more focused study within a specific subfield of Political Science. The Advanced Major Programme is a 20 credit

course: students must have a minimum of seven and a maximum of ten Political Science courses in total; three of these classes must be beyond the 2000-level.

Departmental Requirements

1000 level

- POLI 1100.06 or 1103.06

2000 level

- Two full credits in different subfields

3000 level

- Three full credits which can include POLI 3492.03 and/or 3493.03 (see below)
- One additional full credit in Political Science above the 1000 level

Other required classes

ENGL 1000.06 or King's Foundation Year Programme

Other requirements

- One full credit in a second language, normally French;
- One half-credit in quantitative analysis or research methods, in consultation with the Department advisor, generally either POLI 3492.03 or POLI 3493.03)
- The equivalent of one full-credit introductory class in each of at least two of the following subjects: Economics, History, Philosophy, Sociology and Social Anthropology, and Psychology.

D. Advanced Double Major

Departmental Requirements

1000 level

- POLI 1100.06 or 1103.06

2000 level

- Two full credits in different subfields

3000 level

- Two full credits

Other political science

- One additional full credit in Political Science above 1000 level

Other required classes

- ENGL 1000.06 or King's Foundation Year Programme

Other requirements

- One full credit in a second language, normally French
- One half-credit in quantitative analysis or research methods, in consultation with the Department Advisor, generally either POLI 3492.03 or POLI 3493.03

E. Major Programme

Departmental Requirements

At least four, but not more than eight, classes in Political Science at the 2000 level or above

1000 level

- One full-credit introductory class, or the King's Foundation Year Programme with a final grade of "B" or higher

2000 level

- At least two full classes in at least two different sub-fields

3000 level

- At least two additional full classes should be taken from third-year level offerings

Summer School Classes

The Department normally offers at least one second year or third year class in the summer sessions. For details, see the University's summer school calendar.

III. Classes Offered

The first digit of each class number 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 prerequisite. 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 class 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 1996-97. For final listings check with the Department office or the current timetable.

POLI 1100.06: Introduction to Government and Politics.

There are usually two or three sections of POLI 1100.06, each a full year class taught by a different instructor. The topics vary from section to section and from year to year.

Section 1: 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: J. Smith

FORMAT: Lecture 3 hours

Section 2: 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: D. Middlemiss

FORMAT: Lecture 3 hours

Section 3: With a major emphasis on Canada, this class introduces the basic institutions of government, the processes of politics, and the social environment which influences them. The second term takes a theoretical and analytical approach to competing interpretations of democratic government and individual rights. The nature and distribution of political power will be a principal theme, as students come to understand the theoretical underpinnings to contemporary political life.

INSTRUCTOR: L. Carbert

FORMAT: Lecture 3 hours

POLI 1103.06: Introduction to Government and Politics.

The approach and format in POLI 1103.06 is similar to that in POLI 1100.06 above. This class is also designed, however, to serve as the Department's designated Writing Class.

INSTRUCTOR: Staff

FORMAT: Writing Requirement, lecture 3 hours

POLI 2200.06: Canadian Government and Politics.

The class examines the nature of Confederation in 1867, the original Constitution, and its evolution through convention, amendment, and judicial review, culminating in the changes effected through the Constitution Act of 1982. Attention then turns to the institutions of government, including cabinet, parliament, and the convention of responsible government. The first term concludes with a brief discussion of aboriginal self-government. The second term begins with consideration of federalism and Canada's regional identities, followed by an examination of intergovernmental relations. The remainder of the term is taken up with the study of the principal political processes and mechanisms of Canadian politics, including

political parties, elections and voting behaviour, interest groups and finally, the role of the media, polling and public opinion. Approved with Canadian Studies

INSTRUCTORS: D.M. Cameron, H. Bakvis

FORMAT: Lecture 3 hours

PREREQUISITES: Introductory Political Science class

POLI 2300.06: Comparative Politics.

This class introduces students to the methodology and scope of comparative politics, including analysis of political institutions and behaviour. General overviews and selected case studies are provided for liberal democracies, post-communist, newly industrializing and least developed countries. Topics include theories of the state, political culture and socialization, electoral and party systems, interest groups, ethnic and regional cleavages, gender politics, policy outcomes and system performance, political participation and leadership and contemporary challenges and changes. Group presentations are used for student exploration of these themes.

INSTRUCTOR: D. Black, R. Finbow

FORMAT: Lecture/discussion 3 hours

PREREQUISITE: Introductory political science class or instructors' permission

POLI 2400.06: Foundations of Political Thought.

An overview of early modern and modern political thought, this class examines the bases of political obligation and the political requirements of justice, with special emphasis placed upon the development of contemporary ideas such as rights, rationality, and democracy. The class traces the development of liberalism, and the philosophical tensions within it, from its genesis in the seventeenth century to the present. Some of the theorists studied are Hobbes, Locke, Rousseau, Mill, Hegel, Marx, and Nietzsche.

INSTRUCTOR: K. Fierlbeck

FORMAT: Lecture 2 hours, tutorial 1 hour

PREREQUISITE: POLI 1100.06, 1103.03, FYP, or any introductory Philosophy class

CROSS-LISTING: PHIL 2270.06

POLI 2500.06: World Politics.

To provide a framework for analysis and understanding of contemporary international events, this class deals with the variety of "actors" in world political (principally but not exclusively) states, and examines some concepts in the field.

INSTRUCTOR: F. Harvey

FORMAT: Lecture and discussion 2 hours

PREREQUISITE: Introductory Political Science class or instructor's permission

POLI 2512.06: Canadian-American Relations.

A survey of issues and problems in the conduct of Canada-US relations, together with an analysis of their origins and of the diplomatic and other policy instruments that have been used in responding to them. The premises (and the fate) of various manifestations of Canadian nationalism — in foreign policy, economic policy, cultural policy, and so on — will be carefully considered, along with the effect on the Canada-US relationship of contemporary processes of "globalization".

INSTRUCTOR: D.W. Stairs

FORMAT: Lecture

***POLI 3205.03: 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. Approved with Canadian Studies.

INSTRUCTOR: J. Smith

FORMAT: Seminar 2 hours

PREREQUISITE: POLI 2200.06

CROSS-LISTING: POLI 5205.03

POLI 3206.03: 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

PREREQUISITE: POLI 2200.06

CROSS-LISTING: POLI 5206.03

POLI 3216.03: City Government in Canada.

The unique character of council government is examined in terms of its historical evolution and present structure and operation. Special attention is given to the government of cities and to recent reforms at the metropolitan level. Approved with Canadian Studies.

INSTRUCTOR: D.M. Cameron

FORMAT: Lecture and discussion 2 hours

PREREQUISITE: POLI 2200.06 or equivalent

CROSS-LISTING: POLI 5216.03, PUAD 6400.03

***POLI 3220.03: 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. Approved with Canadian Studies.

INSTRUCTOR: H. Bakvis

FORMAT: Seminar 2 hours

PREREQUISITE: POLI 2200.06 or instructor's permission

CROSS-LISTING: POLI 5220.03, PUAD 6750.03

***POLI 3224.03: 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 emphasized will vary from year to year. Approved with Canadian Studies.

INSTRUCTOR: H. Bakvis

FORMAT: Lecture and discussion 2 hours

PREREQUISITE: POLI 2200.06 or instructor's permission. Students will find it helpful to have some background in statistics or methodology, such as POLI 3494.06.

CROSS-LISTING: POLI 5224.03

***POLI 3233.03: Canadian Political Economy.**

This seminar class, for graduates and senior undergraduates, will explore the relationship between politics and economic life in Canada. Canada's economic development, the role of the state, imperial and continental relationships, the debate over free trade, economic nationalism, and Canada's place in a global economy will be analysed. Students will consider staples, liberal Keynesian and neo-classical, socialist and feminist perspectives. Other topics include women, trade unions, native and immigrant communities, and the impact of economic forces on national unity. Students will debate controversial themes on each topic. Student essays will explore a range of contemporary issues including the debt crisis, the federal-provincial fiscal relations, the economic consequences of Quebec separation, regional development programs, and policies for industrial development, human resources, technological change, poverty and inequality, etc.

INSTRUCTOR: R. Finbow

FORMAT: Seminar 2 hours

PREREQUISITE: Open to graduate students and senior undergraduates, who have completed classes in Canadian politics or economic history, or by permission of the instructor.

CROSS-LISTING: POLI 5233.03

***POLI 3235.03: 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. Approved with Canadian Studies.

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: POLI 5235.03

POLI 3251.06: Canadian Public Administration.

This class examines the organization and management of the executive-bureaucratic structures of government for the formulation and management of public policy and public services. It considers the design and operation of the cabinet system and ministerial portfolios; relations between ministers and the career public service; policy and budgetary processes; and, the structural designs of departments, agencies, crown corporations and regulatory commissions. A major focus will be the effects of the new public management on public administration, as governments in Canada, as elsewhere, seek to cope with budgetary restraints, increased demands for quality services and public participation, and greater effectiveness in securing results.

INSTRUCTOR: P. Aucoin

FORMAT: Lecture and discussion

PREREQUISITE: POLI 2200.06 or instructor's permission.

CROSS-LISTING: POLI 5251.03

***POLI 3302.03: 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 organization 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: D. Black

FORMAT: Seminar 2 hours

PREREQUISITE: POLI 2300.06 or equivalent or instructor's permission

CROSS-LISTING: POLI 5302.03, PUAD 6780.03

***POLI 3304.03: Comparative Federalism.**

A seminar class which examines the theory and practice of federalism within a comparative framework. The actual federations discussed depend 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: POLI 2200.06 or POLI 2300.06 or instructor's permission

CROSS-LISTING: POLI 5304.03, PUAD 6755.03

***POLI 3311.03: Sport and Politics.**

This class examines the role of sport in domestic, transnational and international politics. It addresses the gap in much of mainstream political science concerning the pervasive influence of popular cultural trends and practices on political relations. Some topics include: the role of sport in political socialization and the creation of national identity; the politics of the Olympic Games, and sport and political change in South Africa.

INSTRUCTOR: D. Black

FORMAT: Seminar

PREREQUISITE: POLI 2300.06 or permission of instructor

***POLI 3315.03: 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 intra-regional political economies, and selected aspects of policy such as economic reform, political liberalisation, women and development, drought and ecology, AIDS and health.

INSTRUCTOR: D. Black

FORMAT: Seminar 2 hours

PREREQUISITE: POLI 2300.06 or equivalent or instructor's permission

CROSS-LISTING: POLI 5315.03

POLI 3316.03: Politics in South Africa.

This class focuses on the politics of change and development in South Africa, drawing out both comparative and distinctive lessons. Comparatively, we consider, for example, settler colonialism, ethnic and racial cleavages and conflict, the politics of resistance and "liberation", the challenges of transition to democracy, and the need to balance economic growth and redistribution. Distinctively, we study the origins and implications of South Africa's extraordinary variant of racialist rule, apartheid, and the "negotiated revolution" by which it was transcended.

INSTRUCTOR: D. Black

FORMAT: Seminar

PREREQUISITE: POLI 2300.03

POLI 3325.06: European Politics.

The comparative study of politics in European countries gives a useful perspective on Canadian politics. Focussing primarily on western Europe, this class examines party politics, government institutions, contemporary public policy issues, and related topics in selected European states. Discussion of the politics of the European Union is an integral part of the class.

INSTRUCTOR: R. Boardman

FORMAT: Seminar

PREREQUISITE: POLI 2300.06 or instructor's permission

CROSS-LISTING: POLI 5325.06

***POLI 3360.03: Politics in Latin America.**

This seminar class surveys the politics of Latin American states from colonial to contemporary times. Students first examine political history and development, focusing on particular challenges of colonial inheritance, military politicization, modernization, development and dependency and international interference. Institutions, public policies, and state-society relations are then discussed. Other topics include women and indigenous peoples, and prospects for durable democratization. Students will debate controversial questions on each topic.

INSTRUCTOR: R. Finbow

FORMAT: Seminar 2 hours

PREREQUISITES: POLI 2300 or instructor's consent

CROSS-LISTING: POLI 5360.03

***POLI 3379.06: 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: POLI 2200.06 or POLI 2300.06 or instructor's consent

CROSS-LISTING: POLI 5379.03

***POLI 3427.03: 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: POLI 2400.06/PHIL 2270.06 or POLI

2401.06/PHIL 2070.06, or instructor's permission

EXCLUSION: POLI 2327.03

CROSS-LISTING: WOST 3600.03

POLI 3428.03: Women as Citizen.

Does feminism entail the end of male/female gender roles? Or can women be "equal, but different"? If so, how should government respond in terms of public policy? And how might women do politics differently from men? This class examines the historical context of feminist theory, with attention to its impact on conventional approaches to social and political thought.

INSTRUCTOR: L. Carbert

FORMAT: Seminar

PREREQUISITE: POLI 2400.06/2401.06 or instructor's permission

CROSS-LISTING: PHIL 3170.03, WOST 3500.03

***POLI 3431.03: Politics Through Film and Literature.**

Film literature often capture the depth and texture of politics in a way that the social scientific method cannot. This class uses contemporary novels and films to analyse the Enlightenment, Orientalism, the frontier, and the political economy of community.

INSTRUCTOR: L. Carbert

FORMAT: Seminar 2 hours

PREREQUISITE: POLI 2400.06 or instructor's permission

***POLI 3445.03: Entitlement and Property.**

(Not offered 1998-99)

***POLI 3475.03: 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 class 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: Any political or moral philosophy class or instructor's consent

CROSS-LISTING: POLI 5475.03/PHIL 3475.03

POLI 3492.03: Political Inquiry I: Statistical Analysis.

This class covers topics related to research design, data gathering and aggregate data analysis, and computer programming using SPSS.

INSTRUCTOR: F. Harvey

FORMAT: Lecture/discussion/lab

PREREQUISITE: Introductory Political Science class or instructor's permission.

CO-REQUISITE: POLI 3493.03 (political science honours students only)

EXCLUSION: POLI 2494.06, 3494.06

POLI 3493.03: Political Inquiry II: Philosophy of the Social Sciences.

Is the study of politics "scientific", or must it remain fundamentally subjective regardless of the trappings of scientific discourse which we employ? Rather than a study of politics, this class is a study of the discipline of political science; and investigates the various theoretical and methodological debates regarding what constitutes

"good" political science. How do personal and social values influence "scientific" research, and what are the consequences of this? Which issues should be considered legitimate fields of study in political science? Ought empirical investigations to be limited by considerations of "political correctness"? Is there a purely objective means of identifying and measuring power? And how do we know which particular theoretical approach is best for any given political issue?

INSTRUCTOR: K. Fierbeck

FORMAT: Lecture/discussion

PREREQUISITE: Introductory Political Science class or instructor's permission.

CO-REQUISITE: POLI 3492.03 (political science honours students only)

EXCLUSION: POLI 2494.06, 3494.06

POLI 3520.03: Building Democracy and Peace.

Many people have long argued that there is an intimate relationship between democracy and peace. Thus, they claim, democracies are much more inclined to peace – both internal and external – than other political systems. It is clear that democracy allows the representation of a large number of interests in a society, and this can lead to peaceful resolution of – or accommodation of – disputes. There have been many studies about established democracies in this regard, but less research into societies in transition – i.e., countries which are democratizing. Since countries in transition represent the vast majority of countries in the world, it would seem timely to study this phenomenon. Democratization involves a multitude of steps and must therefore incorporate a great variety of actors, particularly in post-conflict societies. The role of three (overlapping) elements in post-conflict societies in the process of democratizing appear to be key. These elements are civil society, the institutional environment and refugees. This third and fourth year level class will examine these key actors/elements and processes.

INSTRUCTORS: A. Griffiths, S. MacLean, K. Orr

FORMAT: Lecture

***POLI 3525.03: Comparative Foreign Policy Simulation.**

This class is designed for advanced (i.e., 3rd/4th year) undergraduate and graduate students in Political Science. Once students become familiar with basic concepts, theories and decision-making frameworks developed within the sub-field of comparative foreign policy (part 1), they will be expected to apply what they have learned through participation in an interactive computer simulation involving other university teams throughout North and South America and eastern and western Europe. As they attempt to implement policy initiatives and work in teams to resolve international disputes, students will confront foreign policy issues in a context that provides an authenticity of experience. The objective is to enable students to create and test organizational skills, understand the interdependence of international issues, appreciate cultural differences and approaches to world problems, and use computers for multinational communications.

INSTRUCTOR: F. Harvey

FORMAT: Seminar 2 hours

PREREQUISITE: POLI 2500.06 or 3531.03

CROSS-LISTING: POLI 5525.03

***POLI 3531.03: 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: Staff

FORMAT: Seminar 2 hours

PREREQUISITE: Class in international politics or instructor's permission

CROSS-LISTING: POLI 5351.03

***POLI 3535.03: 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.

CROSS-LISTING: POLI 5535.03

***POLI 3537.06: 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.

***POLI 3540.03: 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 permission

CROSS-LISTING: POLI 5540.03

***POLI 3550.03: Japanese Foreign Policy.**

This class focuses on the course of Japan's foreign policy since 1945, and the factors that have shaped its approaches to regional and international issues. Topics are studied in the contexts of Japanese history, cultural traditions, its economy, and domestic politics.

INSTRUCTOR: R. Boardman

FORMAT: Lecture/seminar 2 hours

PREREQUISITE: Class in international politics or instructor's permission

CROSS-LISTING: POLI 5550.03

***POLI 3570.06: 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: Writing Intensive, seminar 2 hours

PREREQUISITE: 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.

CROSS-LISTING: POLI 5570.06

***POLI 3571.06: The Politics of Contemporary Canadian Defence Policy.**

This seminar examines the substance, processes, recurring themes, and major international and domestic determinants of post-World War II Canadian defence policies. It explores several major policy "milestones" (e.g. Canadian Forces' role in the Persian Gulf conflict), and various persistent themes (the "Commitment-capability gap"; efforts to "democratize" defence policy reviews) and current issues (e.g. the implications of recent human rights challenges to traditional military professionalism; the Somalia enquiry and its aftermath) of Canadian defence.

INSTRUCTOR: D. Middlemiss

FORMAT: Seminar 2 hours

PREREQUISITE: Class in international relations, or foreign policy, or postwar Canadian history, or instructor's permission.

Restricted to students in their third year or beyond

CROSS-LISTING: POLI 5571.06

***POLI 3574.03: 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: Class in international politics, US politics or history, or instructor's consent

EXCLUSION: POLI 3572.06

CROSS-LISTING: POLI 5574.03

***POLI 3575.03: 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.

CROSS-LISTING: POLI 5575.03

POLI 3577.03: Civil-Military Relations In Contemporary Western Society.

The course will examine the trilateral relationship between society, government, and the military in the post-Cold War era. The context includes: changing societal values and the domestic pressures they produce; and the implications of a constantly changing strategic environment. Different perspectives will be examined to assess the implications for civil-military relations of the above-noted changes: legal/constitutional (Charter challenges); military/professional (operational requirements); and political (constituency and special interest demands).

INSTRUCTOR: D. Middlemiss

FORMAT: Seminar

PREREQUISITE: POLI 2500 or instructor's permission

CROSS-LISTING: POLI 5577.03

***POLI 3581.03: 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
CROSS-LISTING: POLI 5581.03

***POLI 3585.03: 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.
CROSS-LISTING: POLI 5585.03

***POLI 3589.03: 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.
CROSS-LISTING: POLI 5589.03

***POLI 3591.03: Comparative Maritime Strategies and Oceans Policy.**

With enormous maritime responsibilities, spread over an area that is beyond the national ability to regulate, the domestic and international forces affecting maritime security and oceans policy require continuing study and discussion in Canada. The following are among the topics to be covered in the class: the military dimensions of oceans, including comparative naval strategies, proliferation of naval weaponry, arms control, and disarmament, conflict resolution and other collective/cooperative security arrangements; the role of international law at sea; the use of rules of engagement as a means of exercising political control. Students will be expected to participate in one or more simulation exercises throughout the class.

INSTRUCTOR: P. Haydon/F. Crickard
FORMAT: Lecture/seminar 2 hours

***POLI 3596.03: 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
CROSS-LISTING: POLI 5596.03

POLI 3598.06/3599.03: Political Science Through the Pearson Peacekeeping Centre.

Students may register for a limited number of short courses offered by the Pearson Peacekeeping Centre in Cornwallis, Nova Scotia. To qualify for a Dalhousie University credit, in addition to registering and participating in the approved full-time PPC course, they must undertake structured tutorials both before and after their residency in Cornwallis. In addition, they must prepare the equivalent of a term paper which will be graded as part of the Dalhousie University credit. A proportion of the credit will also be based on post-

coursework report from the faculty of PPC. This class is for students registered at Dalhousie and other universities who wish to earn academic credit for their training at PPC. Normally, no student can earn more than one full-year credit through this link.

INSTRUCTOR: Timothy M. Shaw
FORMAT: Pre-/Post-PPC Seminars/Tutorials
PREREQUISITE: Basic undergraduate or graduate class in Political Science or International Development Studies
CO-REQUISITE: Permission of instructor
CROSS-LISTING: POLI 5599.03, POLI 5598.03

POLI 3601.06: Readings in Political Science.

A full-year reading class, taught only by special arrangement between individual students and individual instructors.

SIGNATURE REQUIRED.
INSTRUCTOR: Staff
CROSS-LISTING: POLI 5601.06

POLI 3602.03: Readings in Political Science.

A one-term reading class, taught only by special arrangement between individual students and individual instructors.

SIGNATURE REQUIRED.
INSTRUCTOR: Staff
CROSS-LISTING: POLI 5602.03

POLI 3603.03: Readings in Political Science.

A one-term reading class, taught only by special arrangement between individual students and individual instructors.

SIGNATURE REQUIRED.
INSTRUCTOR: Staff
CROSS-LISTING: POLI 5603.03

***POLI 4228.03: 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 and 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. Approved with Canadian Studies.

INSTRUCTOR: Staff
FORMAT: Seminar 2 hours
PREREQUISITE: POLI 2200.06 or instructor's permission
CROSS-LISTING: POLI 5228.03, PUAD 6505.03

***POLI 4240.03: 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. Approved with Canadian Studies.

INSTRUCTOR: P. Brown
FORMAT: Seminar 2 hours
PREREQUISITE: Open to Honours students in their fourth year and to graduate students.
CROSS-LISTING: POLI 5240.03, PUAD 5120.03

***POLI 4241.03: 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. Approved with Canadian Studies.

INSTRUCTOR: Staff

FORMAT: Seminar 2 hours

PREREQUISITE: POLI 4240.03 or instructor's permission

CROSS-LISTING: POLI 5241.03, PUAD 5121.03

***POLI 4479.03: Liberalism.**

Liberalism takes a variety of forms and includes many topics including the rule of law, limited government, the free exchange of goods, entitlement to property, the self, and individual rights. Its philosophical and political assumptions provide the intellectual context within which its account of the individual, its vision of the community and its preferred allocation of resources will be assessed.

INSTRUCTOR: Staff

FORMAT: Seminar 2 hours

PREREQUISITE: Normally, classes in philosophy or political science or economics: consult instructor.

CROSS-LISTING: PHIL 4470.03/5470.03, ECON 4446.03/5446.03, POLI 5479.03

POLI 4600.06: Honours Essay.

Political Science undergraduates in the Honours programme are required to attend the Honours seminar as scheduled. This seminar is designed as a research seminar for Honours students.

INSTRUCTOR: D.W. Stairs, Honours Co-ordinator.

RESTRICTION: Restricted to Political Science Honours students in their final year.

POLI 4636.03: Nationalism and Statecraft.

An examination of the sources, ingredients and consequences of contemporary nationalism, with particular reference to its implications for the conduct of international politics. In the early sessions of the class, pertinent literature from the pre-World War II period will be evaluated for its relevance to our understanding of current circumstances, in which the apparent revival of nationalist impulses has coincided with intensifying manifestations of functional interdependence.

INSTRUCTOR: D. Stairs

FORMAT: Seminar

RESTRICTION: Restricted to students in their fourth year

CROSS-LISTING: POLI 5636.03

Psychology

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Chairperson of Department

Moore, C. L.

Student Advisors

To be put in touch with an advisor, go to the Information Desk in Room 3263 of the Psychology Department, or phone (902) 494-3417.

Honours Advisor

Phillips, D.P. (494-2383)
LoLordo, V.M. (494-3441)

Professor Emeritus

Honig, W.K., BA (Swarthmore), PhD (Duke)

Professors

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Connolly, J.F., AB (Holy Cross), MA (Sask), PhD (London)
Croll, R., BSc (Tufts), PhD (McG), Major appointment in
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Dunham, P.J., BA (DePauw), MA, PhD (Missouri)
Fentress, J.C., BA (Amherst), PhD (Cantab)
Klein, R.M., BA (SUNY), MA, PhD (Oregon), Graduate Program
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Kutcher, S., BA, MA, MD (McM), Major appointment in Psychiatry
LoLordo, V.M., AB (Brown), PhD (Penn)
Lyons, R., BA (Dal), MEd (St. FX), PhD (Oregon), Major
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Mitchell, D.E., BSc, MAppSc (Melb), PhD (Berkeley), Faculty of
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Moore, C.L., BA, PhD (Cantab)
Phillips, D.P., BSc, PhD (Monash)
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Rusak, B., BA (Tor), PhD (Berkeley), Joint appointment in
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Semba, K., BEd, MA (Tokyo), PhD (Rutgers), Major appointment in
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Shaw, S.R., BSc (Lond), PhD (St. Andrews)
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Associate Professors

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Kepala, L., BSc (Alberta), MD (Calgary), Major appointment in
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Sullivan, M., MA, PhD (Concordia)

Assistant Professors

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Santor, D., BA (Western), PhD (McGill)
Stewart, S., BSc (Dal), PhD (McGill)

Senior Instructors

Hoffman, R.S., BA (Colo C), MA (Dal)
Leary, J., BSc (Dal), MSc (MUN), PhD (Adelaide)

Adjunct Professors

Backman, J., MA, PhD (Carleton), Psych/IWK Grace Health Centre
Bilsbury, C., BSc, PhD (Liverpool), Psych/QEII Health Sciences
Centre
Byrne, J.M., MA, PhD (Kansas), Psych/IWK - Grace Health Centre
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Clark, J.W., BA, MA (McG), PhD (Queen's)
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Palameta, B., BSc (McG), PhD (Cantab), Psych/UNB
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Trappenberg, T., MSc, PhD (RWTH Aachen), Zev Productions

Postdoctoral Fellows

Jiao, Y.-Y., PhD (Suzhou Medical College, China)
Chen, B., PhD (Okayama Univ.)
Dong, Y.-N., PhD (Beijing Medical University)
Rybak, J., PhD (Freie Universität Berlin)
Schellinck, H., PhD (Dal)
Shore, D., PhD (UBC)
Song, X., PhD (Univ. of New England, Australia)
Sun, X.-J., PhD (Univ. de Paris, Sud)

I. 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.

A. Enrolment Limitations

Potential major and honours students should note that there are enrolment limitations on the number of students that can be accepted into these programmes in any given year. Passing an introductory psychology class with the required grade of B- does not guarantee a place in the major or honours programme. Students are advised to apply as early as possible during the registration period to secure a space within the programme. There are also size restrictions on individual classes. 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 required 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.

B. Enrolment of Non-Major Students

Non-major students may enrol in second-year classes, except PSYO 2000.03 and PSYO 2500.03. However, major and honours students in Psychology are given preference. Non-major students must have at least a B- in an introductory psychology course in order to register in any second-year course in Psychology.

C. Laboratories

Several classes 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 class (PSYO 2000.03) and at least one third-year research laboratory class (full-year for honours students.)

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 class readings.

II. 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.

A. 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 2000.03 and 2500.03 and as many classes from the core programme (see the requirement below) as possible in the second year. Honours students are advised to complete Psychology 3500.06 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 an Honours Advisor. The Psychology Department also offers a BSc honours degree in Neuroscience, described elsewhere in this calendar.

Departmental Requirements

1000 level

- PSYO 1000.06 or 1010.06 or 1500.06 with a grade of "B-" or better

2000 level

- PSYO 2000.03 (with a grade of B or better)
- PSYO 2500.03
- Two credits at the 2000 level. One class must be selected from each of the following groups:

A	B	C
2150.03*	2080.03*	2130.03*
2170.03*	2090.03*	2140.03*
2270.03*	2220.03*	2160.03*
2470.03*		2190.03
2570.03		

* These classes are prerequisites for 3000-level research laboratory classes. Major students must take at least two of these prerequisites in their second year, and those prerequisites must be selected from more than one of the groups.

3000 level

- PSYO 3500.06
- Two credits at the 3000 level. Classes must be selected from at least two of the following groups, and one full credit must be in a research laboratory class or classes:

A	B	C
3051.03 (lab)	3082.03 (Lab)	3010.06
3052.03	3091.03 (Lab)	3041.03/3042.03 (Lab)
3227.03	3092.03	3130.06 (Lab)
3237.03	3122.03 (Lab)	3137.03 (Lab)
3260.03	3129.03	3160.06 (Lab)
3270.03	3220.03	3580.06
3370.03	3280.03	3790.03
3371.03	3390.03	
3760.03		
3770.03		
3775.03 (Lab)		
3970.03		

4000 level

- PSYO 4500.06
- Two half-credits in 4000 level seminar classes. Classes must be selected from at least two of the following groups:

A	B	C
4050.03	4001.03	4040.03
4160.03	4080.03	4130.03
4070.03	4090.03	4140.03
	4120.03	4230.03
	4440.03	

- One other credit at or above the 3000 level.
- Qualifying Exam.

B. 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.

C. Advanced Major in Psychology, 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. The student can be put in touch with an advisor at the Psychology Information Desk (LSC 3263).

Math Requirement for BA

Students majoring in Psychology with a BA degree are required to complete a half credit in Statistics (STAT 1060.03). Refer to the Student's Guide to Psychology Classes, available in the Psychology Department.

Departmental Requirements

1000 level

- PSYO 1000.06 or 1010.06 or 1500.06 with a grade of "B-" or better

2000 level

- PSYO 2000.03
- 1.5 credits at the 2000 level. One class must be selected from each of the following groups:

A	B	C
2150.03*	2080.03*	2130.03*
2170.03*	2090.03*	2140.03*
2270.03*	2220.03*	2160.03*
2470.03*		2190.03
2570.03		

*These classes are prerequisites for 3000-level research laboratory classes. Major students must take at least two of these prerequisites in their second year, and those prerequisites must be selected from more than one of the groupings.

3000 level

- Four credits at, or above, the 3000 level. Classes must be selected from at least two of the following groups, and one of the classes must be a research laboratory class.

A	B	C
3051.03 (Lab)	3082.03 (Lab)	3010.06
3052.03	3091.03 (Lab)	3041.03/3042.03 (Lab)
3227.03	3092.03	3130.06 (Lab)
3237.03	3122.03 (Lab)	3137.03 (Lab)
3260.03	3129.03	3160.06 (Lab)
3270.03	3220.03	3580.06
3370.03	3280.03	3790.03
3371.03	3390.03	
3760.03		
3770.03		
3775.03 (Lab)		
3970.03		

D. Advanced Double Major in Psychology, BA or BSc

The minimum classes in Psychology required by students completing an Advanced Double Major in Psychology are those specified for the three-year departmental major programme.

E. Major in Psychology, BA or BSc

Departmental Requirements

1000 level

- PSYO 1000.06 or 1010.06 or 1500.06 with a grade of "B-" or better

2000 level

- PSYO 2000.03
- 1.5 credits at the 2000 level. One class must be selected from each of the following groups:

A	B	C
2150.03*	2080.03*	2130.03*
2170.03*	2090.03*	2140.03*
2270.03*	2220.03*	2160.03*
2470.03*		2190.03
2570.03		

*These classes are prerequisites for 3000-level research laboratory classes. Major students must take at least two of these prerequisites in their second year, and those prerequisites must be selected from more than one of the groups.

3000 level

- Two credits at the 3000 level. Classes must be selected from at least two of the following groups, and one of the classes must be a research laboratory class:

A	B	C
3051.03 (Lab)	3082.03 (Lab)	3010.06
3052.03	3091.03 (Lab)	3041.03/3042.03 (Lab)
3227.03	3092.03	3130.06 (Lab)
3237.03	3122.03 (Lab)	3137.03 (Lab)
3260.03	3129.03	3160.06 (Lab)
3270.03	3220.03	3580.06
3370.03	3280.03	3790.03
3371.03	3390.03	
3760.03		
3770.03		
3775.03 (Lab)		
3970.03		

F. 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. B. Earhard for further information.

G. 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 19.5 (Academic Regulations section of this calendar) for further information.

III. Classes Offered

NOTE: Not all of the classes listed below are offered every year. Please consult the current timetable to determine if a class is offered.

PSYO 1000.06: 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. PSYO 1000 meets three hours a week for lectures. The grade is based on a number of examinations given at intervals throughout the year.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PSYO 1010.06: Introduction to Psychology.

The content of PSYO 1010.06 is similar to that of PSYO 1000.06 but the manner of teaching is different. This class involves written work and is most suitable for students who are able to work on their own. In PSYO 1010.06 there are no lectures, but students meet individually with a tutor to discuss the material and have their quizzes assessed. The textbook and accompanying notes are divided into a number of units. Students prepare answers to a number of questions that are given with each unit. When they feel they have mastered the content of a unit, they write a quiz consisting of two short answer questions they have seen in advance. Then they review and discuss their quiz with their tutor. If the student's answer is judged to contain all the essential information in a clear and concise form, 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 must take another quiz on the same material. The student must pass a quiz in a unit before he or she can proceed to the next unit. The grade for the class is based entirely on the number of units the student completes within scheduled time limits during the academic year (for example, in 1994-95, 17 of 26 units for a D, 26 of 26 for an A). Students must meet their tutors during the scheduled class time. A handout giving more information about this class may be picked up at the Reception Desk in the Psychology Department.

NOTE: This class may not be offered in 1998/99.

INSTRUCTOR: Staff

FORMAT: Tutorial 2-3 hours

PSYO 1500.06: Introduction to Psychology.

The content of PSYO 1500.06 is similar to that of regular PSYO 1000.06 classes. The major difference is that there are in-class laboratories in PSYO 1500.06. 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 PSYO 1500.06 will be comparable to that imposed in other introductory Psychology classes.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PSYO 2000.03: 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 PSYO 2000.03 must attend the first lecture session. Due to enrolment limitations, only Dalhousie students majoring in Psychology or Neuroscience may enrol in this class, unless space is available after the first class.

INSTRUCTORS: P. Dunham, R. Hoffman and J. Leary

FORMAT: Writing Intensive, lecture 2 hours, lab 2 hours

PREREQUISITE: A grade of B- or better in PSYO 1000.06 or 1010.06 or 1500.06

PSYO 2080.03: 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 skeptical 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 those questions.

INSTRUCTOR: D. Santor

FORMAT: Lecture 3 hours

PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE 1500.30 (with a grade of B- or better)

PSYO 2090.03: 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.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE 1500.30 (with a grade of B- or better)

PSYO 2130.03: 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.

INSTRUCTOR: B. Earhard

FORMAT: Lecture 3 hours

PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE 1500.30 (with a grade of B- or better)

CROSS-LISTING: NESC 2130.03

PSYO 2140.03: 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 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.

INSTRUCTOR: V. LoLordo

FORMAT: Lecture 3 hours

PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE 1500.30 (with a grade of B- or better)

CROSS-LISTING: NESC 2140.03

PSYO 2150.03: 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.

INSTRUCTOR: D.E. Mitchell

FORMAT: Lecture 3 hours

PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE 1500.30 (with a grade of B- or better) or BIOL 1000.06

CROSS-LISTING: NESC 2150.03

PSYO 2160.03: 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.

INSTRUCTOR: B.R. Moore
FORMAT: Lecture 3 hours
PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE 1500.30 (with a grade of B- or better) or BIOL 1000.06
CROSS-LISTING: NESC 2160.03

PSYO 2170.03: 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.

INSTRUCTOR: R.E. Brown
FORMAT: Lecture 3 hours
PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE 1500.30 (with a grade of B- or better) or BIOL 1000.06.
CROSS-LISTING: NESC 2170.03

PSYO 2190.03: Psycholinguistics.

An introduction to the processes in the use of language by human beings. The main topics are: 1) the nature of language, 2) syntactic organizations, 3) propositions, 4) thematic structures, 5) speech comprehension, 6) speech production, 7) speech acts, 8) discourses, and 9) language development.

INSTRUCTOR: M. Yoon
FORMAT: Lecture 3 hours
PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE 1500.30 (with a grade of B- or better)
CROSS-LISTING: NESC 2190.03

PSYO 2220.03: Abnormal Behaviour.

This class involves the study of a broad range of manifestations of abnormal behaviour in adults (e.g. anxiety disorders, substance abuse/dependence, schizophrenia, affective disorders, personality disorders). For each disorder, various theoretical accounts of etiology and approaches to intervention will be considered. This class focuses not only on what is known about the causes and treatments of abnormal behaviour, but also on the scientific techniques clinical psychologists have developed to better understand and better intervene with various forms of behavioural dysfunction.

INSTRUCTOR: S. Stewart or J. Connolly
FORMAT: Lecture 3 hours
PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE 1500.30 (with a grade of B- or better)
EXCLUSION: PSYO 3121.03.

PSYO 2270.03: Introduction to 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, and localization of brain function are examples of the topics covered.

INSTRUCTOR: M. Ozler
FORMAT: Lecture 3 hours
PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE 1500.30 (with a grade of B- or better)
CROSS-LISTING: NESC 2270.03

PSYO 2470.03: Introduction to Neuroscience I. Brain Systems.

This lecture class is intended to provide an introduction to the gross structures and functions of the brain. The class treats the brain as a set of neural systems, each with relatively well-defined anatomical substrates and functional roles. The class examines each neural system one at a time, exploring its anatomical architecture, connections and function. These systems may include the peripheral nerves, the mechanisms of sensation and motor control, the cranial nerves, the brainstem, cerebral cortex and cerebellum. For each of the neural systems, the class examines some of the clinical consequences of injury or pathology. Introduction is also provided

to recent advances in brain imaging and brain chemistry. This class does not cover cellular or molecular mechanisms of brain function in any detail; students wishing explicit instruction in those fields should see the Calendar entries for "Introduction to Neuroscience II. Cellular Neurobiology" and/or "Molecular Neuroscience", respectively.

INSTRUCTOR: R. Brown, D. Mitchell, D. Phillips
FORMAT: Lecture 3 hours
PREREQUISITE: PSYO 1000.06 or 1010.06 or 1500.06 or SCIE 1500.30 (with a grade of B- or better) or BIOL 1000.06
EXCLUSION: PSYO/NESC 2071.03
CROSS-LISTING: NESC 2470.03

PSYO 2500.03: Contemporary Research Problems In Psychology.

As a continuation of PSYO 2000.03, 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 class 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.

This class is a preparatory class for students planning to do an honours degree in psychology, and admission will be restricted to students whose academic record indicates an ability to perform at the honours level. No one will be admitted until they have completed PSYO 2000.03 with a grade of B or better; a high level of performance in other Psychology classes along with an overall average of B+ (GPA 3.30) will normally be expected.

SIGNATURE REQUIRED

INSTRUCTOR: J. Leary, R. Hoffman
FORMAT: Lecture 2 hours, lab 2 hours
PREREQUISITE: PSYO 2000.03, with grade of B or better and permission of the instructor

PSYO 2570.03: Introduction to Neuroscience II. Cellular Neurobiology.

Building on the knowledge of holistic aspects of brain function gained in PSYO 2470.03, 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.

INSTRUCTOR: S.R. Shaw
FORMAT: Lecture 3 hours
PREREQUISITE: PSYO/NESC 2470.03 or instructor's consent
EXCLUSION: PSYO/NESC 2072.03
CROSS-LISTING: NESC 2570.03

PSYO 3000.06: Independent Research in Modern Psychology.

Primarily for honours students wishing further experience and understanding of psychological research. Students not in the honours programme normally will be expected to have a grade of B or better in PSYO 2000.03, a high level of performance in other Psychology classes, and an overall B+ (GPA 3.30) average. A student in the class chooses a faculty member who serves as an advisor throughout the academic year, and under whose supervision independent research is conducted. Before registering for this class, a student must provide the instructor of the class with a letter from the faculty member who has agreed to supervise the course of study. Class approval will not be given until this is done.

NOTE: This class cannot be used to fulfill the department's research laboratory requirement.

SIGNATURE REQUIRED
INSTRUCTOR: D. Mitchell
FORMAT: Lab 4 hours

PREREQUISITES: PSYO 2000.03 and previous or concurrent enrolment in two other 3000-level classes; and instructor's consent

CROSS-LISTING: NESC 3000.06

PSYO 3010.06: 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 PSYO 1010.06 at a level which enables him or her to instruct introductory students in individual tutorials. The class is designed primarily for honours students, and prospective students are advised to consult the instructor in the spring of the preceding year.

SIGNATURE REQUIRED

INSTRUCTOR: Staff

FORMAT: Lecture 2 hours, tutorial 3 hours

PREREQUISITE: PSYO 2000.03, advanced classes in psychology and instructor's consent

PSYO 3041.03: Learning and Conditioning I.

This class provides detailed examination of the various forms of Pavlovian and instrumental conditioning, imprinting, song learning by birds, imitation, and related processes. The emphasis is on identification and analysis of fundamental mechanisms, their boundaries, biological significance, and evolutionary origins. We also attempt to identify unresolved problems which might be studied in PSYO 3042.03.

FORMAT: Lecture and discussion 3 hours

INSTRUCTOR: B. Moore

PREREQUISITE: PSYO 2000.03 and PSYO/NESC 2140.03

EXCLUSION: PSYO 3040.06

PSYO 3042.03: Learning and Conditioning II.

Unresolved problems identified by the students or professor during PSYO 3041.03 will be analyzed, and suitable experiments designed to answer them where possible. Students will then choose and conduct original research projects. They normally work in groups of three or four, each participating in one major study, or a series of smaller, related ones. While cooperating in their research and in some aspects of data analysis, each student writes his or her own report.

NOTE: Students should note that BOTH 3041.03 and 3042.03 must be completed to satisfy the departmental research laboratory requirement.

FORMAT: Research lab 3 hours

INSTRUCTOR: B. Moore

PREREQUISITE: PSYO 3041.03 or instructor's consent

EXCLUSION: PSYO 3040.06

PSYO 3051.03: Sensory Neuroscience I - Vision.

Because our visual perceptions are rich, varied and with few exceptions, arise quickly, flawlessly and without apparent cognitive effort, it might be thought that the underlying processes are simple. That this is not the case is illustrated by the difficulty with which the performance of our biological visual system can be matched by artificial systems. Beginning with a description of the information available in the retinal image, this class will examine the neural basis for the perception of light, colour, movement, depth and form in a variety of species chosen to illustrate common as well as specialized mechanisms of neural processing. In addition, the class will describe the development of perception and discuss the extent to which performance at any age is constrained by the anatomical and physiological development at various levels within the visual pathway.

INSTRUCTOR: D. Mitchell

FORMAT: Lecture 3 hours, research lab 2 hours

PREREQUISITES: PSYO 2000.03, and PSYO/NESC 2150.03 or 2470.03

EXCLUSION: PSYO/NESC 3050.06

CROSS-LISTING: NESC 3051.03

PSYO 3052.03: Sensory Neuroscience II. Hearing and Speech.

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.

INSTRUCTOR: D. Phillips

FORMAT: Lecture 3 hours

PREREQUISITES: PSYO 2000.03, PSYO/NESC 2150.03 or 3051.03;

PSYO/NESC 2470.03 is strongly recommended

EXCLUSION: PSYO/NESC 3150.03

CROSS-LISTING: NESC 3052.03

PSYO 3082.03: Experimental Social Psychology.

The primary goal of this class is to develop students' skill level in empirical analysis in social psychology. We examine how the tools of science can be used to help us understand more about social thinking and social behaviour. The class is primarily a skills class; in other words, emphasizing active student learning rather than didactic teaching. Students will be required to complete two research projects during the term. The projects will involve testing subjects, coding data, computer data analysis, and report writing. Familiarity with computer-based statistical analysis and text processing is strongly recommended.

INSTRUCTOR: J. Barnes

FORMAT: Lecture 1 hour, research lab 2 hours

PREREQUISITES: PSYO 2000.03 and 2080.03

PSYO 3091.03: Methods in Developmental Psychology.

This class is a survey of the research methods that are used in developmental psychology. It largely assumes knowledge of basic methodology and design issues common to all areas of Psychology and concentrates on those methods that are of special relevance to the study of development in humans from birth through childhood. In addition to the lectures, students will carry out a number of research exercises to gain experience in conducting research with children.

INSTRUCTOR: C. Moore

FORMAT: Lecture 2 hours, research lab 1 hour

PREREQUISITES: PSYO 2000.03 and 2090.03

PSYO 3092.03: 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.

INSTRUCTOR: C. Moore

FORMAT: Lecture 3 hours

PREREQUISITES: PSYO 2000.03 and 2090.03

PSYO 3122.03: Methods in Experimental Clinical Psychology.

This class focuses on the methods used in the experimental study of abnormal human behaviour. Students learn how to conduct research on topics in applied clinical psychology. Lectures proceed from a discussion of the general problems of using the scientific

method in studying abnormal behaviour, to a more specific examination of the analytic procedures commonly employed to investigate topics in clinical psychology. Students conduct a series of research projects in the laboratory by serving both as subjects and experimenters. These studies will illustrate some of the important concepts discussed in class. Students are required to analyze the results of these studies in written lab reports. Due to enrolment limitations, this class will be limited to students majoring in Psychology, unless space is available after the first class.

INSTRUCTOR: S. Stewart

FORMAT: Lecture 2 hours; research lab 2 hours

PREREQUISITES: PSYO 2000.03 and 2220.03 or instructor's consent

PSYO 3129.03: 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.

INSTRUCTOR: P. McGrath

FORMAT: Lecture 3 hours, proficiency lab

PREREQUISITE: PSYO 2000.03; PSYO 2220.03 recommended

PSYO 3130.06: 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.

INSTRUCTOR: P. McMullen

FORMAT: Lecture 2 hours, research lab 2 hours

PREREQUISITES: PSYO 2000.03 and either PSYO/NESC 2130.03, 2150.03, 2270.03 or instructor's consent

CROSS-LISTING: NESC 3130.06

PSYO 3137.03: Research Methods In Cognitive Neuroscience.

The focus of this class will be on the methodological approaches as well as the techniques used to study human cognition from a neural perspective. Readings will be used in which cognitive functions such as memory, language, perception and attention are examined using brain imaging methods; methods discussed will include positron emission tomography (PET), functional magnetic resonance imaging (fMRI), magnetoencephalography (MEG), electroencephalography/event-related potential measures (EEG/ERP) and eye movement recordings. Students will learn about these methods, their strengths and weaknesses, as well as how they can be used together in a complementary fashion. Students will conduct several research projects in the laboratory and will learn the basics of human electrophysiological recording and analysis methods. Students will serve as experimenters and subjects for class experiments and will be responsible for producing written laboratory reports for each experiment.

INSTRUCTOR: J. Connolly

FORMAT: Lecture 2 hours, research lab 2 hours

PREREQUISITES: PSYO 2000.03 and PSYO/NESC 2130.03.

RECOMMENDED: PSYO/NESC 2470.03

CROSS-LISTING: NESC 3137.03

PSYO 3160.06: 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).

INSTRUCTOR: J. Fentress

FORMAT: Lecture 2 hours, research lab 2 hours

PREREQUISITES: PSYO 2000.03 and PSYO/NESC 2160.03, or BIOL 1000.06 and instructor's consent

CROSS-LISTING: NESC 3160.06

PSYO 3220.03: 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 class 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.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PREREQUISITES: PSYO 2000.03 and 2220.03

EXCLUSION: PSYO 2120.03

PSYO 3227.03: Principles of Human Neuropsychology.

In this class we study current knowledge about the ways in which behaviour changes when the human brain is damaged. We also learn how that knowledge is used in the diagnosis, assessment and rehabilitation of individual cases. The research methods we consider include brain-imaging technologies and neuropsychological test batteries. Here are two samples of the many questions we may ask: How does the brain produce awareness of the external environment and the internal state of the body, and how does awareness change as a result of faulty brain function? What do we know about the changed brains and the adjusted behaviours of people who suffer from stroke or dementia or traumatic head injuries?

INSTRUCTOR: M. Ozler

FORMAT: Lecture 3 hours

PREREQUISITES: PSYO 2000.03, and PSYO/NESC 2270.03 or PSYO/NESC 2470.03, or instructor's consent

CROSS-LISTING: NESC 3227.03

PSYO 3237.03: 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, tranquilizers, and antipsychotic drugs.

INSTRUCTOR: R.E. Brown

FORMAT: Lecture 3 hours

PREREQUISITES: PSYO 2000.03 and one 2000-level class from Group A

EXCLUSION: PSYO/NESC 2370.03

CROSS-LISTING: NESC 3237.03

PSYO 3260.03: 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.

INSTRUCTOR: B. Rusak

FORMAT: Lecture 3 hours

PREREQUISITES: PSYO 2000.03, or BIOL 1000.06 and permission of instructor

CROSS-LISTING: NESC 3260.03

PSYO 3270.03: 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.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PREREQUISITES: PSYO 2000.03, PSYO/NESC 2470.03 and 2570.03

CROSS-LISTING: NESC 3270.03

PSYO 3280.03: 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?

INSTRUCTOR: J. Barresi

FORMAT: Lecture 3 hours

PREREQUISITES: PSYO 2000.03 and one 2000-level class from Group B

EXCLUSION: PSYO 2280.03

PSYO 3370.03: Neuroscience Laboratory I.

The two classes PSYO/NESC 3370.03 and 3371.03 (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 3370.03, while detailed neuroanatomically-based approaches are favoured in 3371.03.

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.

SIGNATURE REQUIRED

INSTRUCTOR: S.R. Shaw

FORMAT: Lab 3 hours

PREREQUISITES: PSYO 2000.03, PSYO/NESC 2470.03 and 2570.03, or 3270.03, and instructor's consent

CROSS-LISTING: NESC 3370.03

PSYO 3371.03: Neuroscience Laboratory II.

For a description of this type of neuroscience lab class, see the entry under 3370.03 above; usually, 3371.03 is coordinated closely with 3370.03. Lab II usually, but not always, runs in the second term and develops different research approaches.

SIGNATURE REQUIRED

INSTRUCTOR: I.A. Meinertzhagen

FORMAT: Lab 3 hours

PREREQUISITES: PSYO 2000.03, PSYO/NESC 2470.03 and 2570.03, or 3270.03, and instructor's consent

CROSS-LISTING: NESC 3371.03

PSYO 3390.03: 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.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PREREQUISITES: PSYO 2000.03 and 2090.03 or instructor's consent

PSYO 3500.06: 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.

SIGNATURE REQUIRED

INSTRUCTOR: G. Schellenberg

FORMAT: Lecture 2 hours, skills lab 2 hours

PREREQUISITE: PSYO 2000.03 and instructor's consent

PSYO 3580.06: 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.

INSTRUCTOR: Staff

FORMAT: Seminar 3 hours

PREREQUISITE: PSYO 2000.03 or instructor's consent

PSYO 3770.03: Behavioural Neuroscience.

Behavioural neuroscience concerns itself with the neural mechanisms underlying a variety of behavioural phenomena. Its subject matter includes the neural mechanisms controlling a variety of regulatory and motivational systems, including: feeding, drinking, reward, sexual and parental behaviour, temperature regulation, sleep and waking, motor and sensory system function, learning and other forms of behavioural plasticity, memory, and the physiological mechanisms underlying behavioural disorders. Students should be familiar with experimental research methods, and have some background in biological or neural aspects of psychology.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PREREQUISITES: PSYO 2000.03 and PSYO/NESC 2470.03

EXCLUSION: PSYO/NESC 3070.06 or 3071.06

CROSS-LISTING: NESC 3770.03

PSYO 3775.03: Behavioural Neuroscience Laboratory.

The purpose of this laboratory class is to expose students who are motivated to pursue a career in neuroscience, or in a related biomedical discipline, direct experience of research involving studies of the nervous system in relation to behaviour. Students will be expected to acquire skills in animal handling, animal care, recovery surgery, behavioural observations, and histological analysis of the brain. Acquisition of these methods during the class should facilitate students' research efforts in their honours theses.

SIGNATURE REQUIRED

INSTRUCTOR: Staff

FORMAT: Research lab 3+ hours

PREREQUISITES: PSYO/NESC 3770.03 and instructor's consent

EXCLUSION: PSYO/NESC 3070.06

CROSS-LISTING: NESC 3775.03

PSYO 3790.03: Neurolinguistics.

This class is designed to build upon the outline of linguistics provided in PSYO/NESC 2190.03. The course will cover: 1) brain damage and language disorders, 2) aphasia, 3) localization of lesions in the human brain, 4) neuroimaging, 5) intracranial electric stimulation experiments, 6) event related brain potential experiments, 7) PET, f-NMR scan experiments, and 8) neural models of language processing.

INSTRUCTOR: M. Yoon

FORMAT: Lecture 3 hours

PREREQUISITES: NESC/PSYO 2470.03 and NESC/PSYO 2190.03, or instructor's consent

CROSS-LISTING: NESC 3790.03

PSYO 3970.03: Molecular Neuroscience.

This class will continue ideas introduced in PSYO 2570.03 on the molecular basis of neuronal function and of the role of gene expression in the functioning and development of the nervous system. We will introduce the role of G-proteins and their receptors in neuronal signalling, and of second messengers in neuronal function and development. We will extend into areas of neuronal development, especially of gene regulation in the nervous system, transcription and transcription factors, as well as the molecular control of neural development, especially through the control of cell differentiation and the outgrowth of axons in the nervous system and the specificity of their connections, and neuron-target interactions, especially through the role of trophic factors.

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PREREQUISITE: PSYO/NESC 2570.03

CROSS-LISTING: NESC 3970.03

4000-Level Seminars

These seminars (4000-4440) are intended for 4th year honours students. Third-year honours students are eligible provided they obtain permission from the instructor, and the needs of all the fourth-year honours students have been met. The topics covered in these classes vary from year to year. Class format is usually 2 hours, instructors vary by topic. Consult the department for the specific class descriptions.

PSYO 4000.03: Senior Seminar.

This class is an individually tailored reading or study class. It is designed to allow a student to focus on a particular issue, or set of related issues, that are not part of the regular programme. Students may register for this class if they can find a staff member who is prepared to supervise the course of study. Before attempting to register for this class, a student must provide the chairperson of the Undergraduate Programme Committee with: (a) a one page description of the proposed course of study, (b) a letter from a staff member agreeing to supervise the programme outlined. A copy of the completed project, and a mark, must be submitted to the Undergraduate Programme Committee chairperson by December 15 or April 15.

SIGNATURE REQUIRED

CROSS-LISTING: NESC 4000.03

PSYO 4001.03: Contemporary Issues in Psychology.**PSYO 4040.03: Learning Applications in Clinical and Social Psychology.****PSYO 4050.03: Topics in Perception.**

CROSS-LISTING: NESC 4050.03

PSYO 4070.03: Neuroscience Seminar.

PREREQUISITES: PSYO 2470.03, 2570.03 or 3270.03, or instructor's consent

CROSS-LISTING: NESC 4070.03/5070.03, ANAT 5070.03

PSYO 4080.03: Topics in Social Psychology and Personality.**PSYO 4090.03: Development of Social Behaviour.****PSYO 4120.03: Topics in Clinical Psychology.****PSYO 4130.03: Topics in Human Information Processing.**

CROSS-LISTING: NESC 4130.03

PSYO 4140.03: Animal Learning Topics.**PSYO 4160.03: Topics in Behavioural Biology.**

CROSS-LISTING: NESC 4160.03

PSYO 4500.06: 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: D. Phillips and V. Lolordo

RESTRICTION: Restricted to honours students in their graduating year

CROSS-LISTING: NESC 4500.06

Public Administration

School of Public Administration

Location: 6152 Coburg Road, Sixth Floor
Halifax, NS B3H 3J5
Telephone: (902) 494-3742
Fax: (902) 494-7023
WWW: <http://www.mgmt.dal.ca/spa>
E-Mail: Dalmpa@dal.ca

Dean

Rosson, P., Dip MS (Salford), MA (Lancaster), PhD (Bath)

Director of the School

Sullivan, K.C.

Undergraduate Advisor

Poel, D.

Professors

Aucoin, P., BA (SMU), MA (Dal), PhD (Queen's), jointly with Political Science
Bakvis, H., BA (Qu), MA (UBC), PhD (UBC), jointly with Political Science
Brown, M.P., BA (MtA), MA (Dal), PhD (Tor)
McNiven, J.D., MA, PhD (Mich)
Poel, D.H., BA (Calvin), MA (W. Mich), PhD (Iowa)
Sullivan, K.C., BSc, BEd, (Dal), MEd, PhD (Alta)
Traves, T., BA (Man), MA, PhD (York), President and Vice-Chancellor, Dalhousie University

Associate Professors

Ricker, E., BA, MEd (UBC), PhD (Tor)
Siddiq, F.K. (Graduate Co-ordinator), BA, MA (Dhaka), PhD (Dal)

Assistant Professors

Cassin, A.M., BA (Man), MA (UBC), PhD (Tor)

Adjunct Professors

Durier-Copp, M., BA, MA, PhD (McG)
Farjoy, E., BSc (Hons) LLD (UNB)
Lopes, B., BA (SMU)
O'Brien, A., BSc, LLD (Dal)
Pross, A.P., BA, MA (Queens), PhD (Tor)
Regan, T., BA (Tor), MA, PhD (Duke), (Department of Sociology, Acadia University)

Special Lecturers

Carroll, R., BBA, BEd (St. FX), MBA (Dal), PhD (Dal) CGA

I. 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 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 GDPA - and the undergraduate Diploma 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.

A. The Diploma in Public Administration (DPA Programme)

The DPA 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.

Requirements (1 year)

Total credits required - 5

Required GPA for graduation - 1.70

Required classes

- COMM 1101.03/1102.03 or POLI 3492.03, 3493.03
- COMM 2301.03, 2302.03
- POLI 2200.06
- PUAD 2249.03, 2250.03
- 1 credit elective approved by the school

The School is presently looking at revamping the class requirements for the Diploma in Public Administration.

B. 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 June 1 in the academic year in which studies are to commence.

Further information on the Diploma 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 and the School's website at <http://www.mgmt.dal.ca/spa>.

1. Part-time Study

Students may complete the Diploma 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.

2. 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 Diploma 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 Diploma.

3. The Special Diploma Programme

The Special Diploma programme is a course of study which gives students who do not satisfy the general requirements for admission to the Faculty of Graduate Studies an opportunity to qualify for admission to the GDPA 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 Diploma, 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 Diploma 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.

III. Classes Offered

PUAD 2249.03: Organization Theory for Public Administration.

This class 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 class 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: P. Aucoin

FORMAT: Seminar 2 hours

PUAD 2250.03: 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: P. Aucoin

FORMAT: Seminar 2 hours

Religion

See "Comparative Religion" entry (pg. 95).

Russian Studies

Location: 1376 LeMarchant Street
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Dean

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Chair

Pereira, N.G.O.

Undergraduate Advisor

Vitins, I. (494-6923)

Professor

Pereira, N.G.O., BA (Williams), MA, PhD (UC Berkeley)

Associate Professor

Vitins, I., BA (Mich), PhD (UC Berkeley)

Assistant Professors

Barnstead, J.A., BA (Oakland), AM (Harvard)

MacFadyen, D., PhD (UCLA)

Glazov, M., Kandidat (Moscow)

I. Introduction

The Russian Studies Department offers classes in Russian language, literature, culture and history. 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. Recent radical shifts in the country 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 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 Russian Studies Department, take up to one semester (5 full credits) of work at a University in Russia and receive credit at Dalhousie. Qualified students are urged to participate in the Intensive Russian Programme, founded by Dalhousie, which enables Canadian students to study for a semester at St. Petersburg State University.

II. Degree Programmes

Classes in the Russian Studies Department are open to students either (1) as electives in any degree programme; (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.

A. Honours in Russian Studies

Departmental requirements

1000 level

- RUSS 1000.06

2000 level

- RUSS 2002.03
- RUSS 2003.03
- RUSS 2051.03
- RUSS 2052.03
- Five other credits at or above the 2000 level and not including those listed below.

3000 level

- Two credits at 3000 level or higher, one being RUSS 3002.03 and 3003.03

4000 level

- RUSS 4000.06

Other required classes

- One class in Russian History (normally RUSS 2022.03 and/or 2023.03)
- Honours Thesis

B. Advanced Major in Russian Studies

Departmental requirements

1000 level

- RUSS 1000.06

2000 level

- Three credits at or above the 2000 level including RUSS 2002.03, 2003.03, 2051.03 and 2052.03

3000 level

- Three credits at or above the 3000 level, one being RUSS 3002.03 and 3003.03

4000 level

- RUSS 4000.06

Other required classes

- One class in Russian History (normally RUSS 2022.03 and/or 2023.03).

C. Major in Russian Studies

Departmental Requirements

1000 level

- RUSS 1000.06

2000 level

- RUSS 2002.03, 2003.03, 2051.03, and 2052.03

3000 level

- Two credits at or above the 3000 level, one being RUSS 3002.03 and 3003.03

D. Intensive Russian Programme

Coordinator

Pereira, N.G.O. (494-3354)

Assistant to the Coordinator

Hebb, W. (494-3679)

1. Introduction

The Intensive Russian Programme (the first of its kind in Canada), is an inter-disciplinary course of instruction which allows students to undertake intensive study of the Russian language both here and in

Russia at St. Petersburg University. This programme is offered at the third-year level of language study for students who have successfully (mark of "B") completed two years of Russian or its equivalent. Students at Dalhousie must enrol in a third-year intensive Fall preparatory session prior to going to Russia.

If students from elsewhere wish to join the third-year programme only in Russia, they may do so after successful completion of application requirements.

2. Classes at Dalhousie (September to December)

Students are required to take:

- RUSS 3002.03: Grammar;
 - RUSS 3029.03: Conversation;
 - RUSS 3121.03: 19th Century Russian Prose and Poetry
- or
- RUSS 3122.03: 20th Century Russian Prose and Poetry;
 - RUSS 3090.03: Russian Society Today; or RUSS 3092.03 or 3096.03

one additional A-term class in History or Russian Literature.

3. Classes at St. Petersburg State University (January to May)

- RUSS 3011.03: Grammar I;
- RUSS 3012.03: Grammar II;
- RUSS 3031.03: Conversation;
- RUSS 3032.03: Translation;
- RUSS 3035.03: Literature - Reading and Analysis

IV. Classes Offered

RUSS 1000.06: 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 4 hours

*RUSS 1020.03: Russian Culture and Civilization under the Tsars.

Conducted in English. The class traces developments in the Russian arts: painting, sculpture, theatre and music. Religious and secular ideas are also discussed.

FORMAT: Lecture/discussion 2 hours

RUSS 1070.03: Modern Russian Culture and Civilization.

Conducted in English. The cultural and political history of 20th century Russia.

FORMAT: Lecture/discussion 2 hours

RUSS 2002.03: Intermediate Russian I.

A continuation of RUSS 1000.06. 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: C+ in Russian 1000.06 or permission of instructor

RUSS 2003.03: Intermediate Russian II.

A continuation of RUSS 2002.03.

FORMAT: Instruction/drill 5 hours

PREREQUISITE: RUSS 2002.03 or equivalent

EXCLUSION: RUSS 2000.06

RUSS 2022.03: Imperial Russia.

Equivalent to the first half of HIST 2020.06. Chronologically covers the imperial period of Russian history, from Peter the Great to the Revolution of 1917.

FORMAT: Lecture/discussion

EXCLUSION: May not be taken by students who have completed HIST 2020.06, RUSS 2021.06

RUSS 2023.03: Soviet Russia.

Equivalent to the second half of HIST 2020.06. Chronologically covers the Soviet period of Russian history, from 1917 to Gorbachev.

FORMAT: Lecture/discussion

EXCLUSION: May not be taken by students who have completed HIST 2020.06 or RUSS 2021.06

RUSS 2029.03: Conversation.

Development of conversational skills and vocabulary building.

FORMAT: Conversation practice

PREREQUISITE: RUSS 1000.06 and concurrent enrolment in RUSS 2002.03 or permission of instructor.

EXCLUSION: RUSS 2001.06

RUSS 2033.03: Survey of Russian Film.

Conducted in English. A history of Russian film from 1896 to present, with emphasis on the pioneering work of Sergei Eisenstein, Dziga Vertov, Vsevolod Pudovkin, and Aleksandr Dovzhenko; for the later period, extended treatment is given to the films of Andrei Tarkovsky.

INSTRUCTOR: J.A. Barnstead

FORMAT: Lecture/discussion

RUSS 2051.03: Survey of Russian Literature.

Conducted in English with section in Russian for majors. Required for majors and honours candidates. An overview of Russian literature from its beginnings through Tolstoy.

FORMAT: \approx Writing Requirement (when taken in combination with RUSS 2052.03), lecture and discussion 3 hours

EXCLUSION: RUSS 2050.06

RUSS 2052.03: Survey of Russian Literature.

Conducted in English with section in Russian for majors. Required for majors and honours candidates. An overview of Russian literature from Chekhov to the present.

FORMAT: \approx Writing Requirement (when taken in combination with RUSS 2051.03), lecture and discussion 3 hours

EXCLUSION: RUSS 2050.06

*RUSS 2061.03: 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/discussion 2 hours.

EXCLUSION: RUSS 2340.03

*RUSS 2062.03: 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, Olesha, Pilnyak, Zoshchenko, and Bulgakov.

FORMAT: Lecture/discussion 2 hours.

EXCLUSION: RUSS 3250.03

*RUSS 2070.03: Russian Literature and Culture since Stalin's Death.

Conducted in English. The literary and cultural 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, *samizdat* and literature since *glasnost*.

FORMAT: Lecture/discussion 2 hours

RUSS 2081.03: Contemporary Russian Culture - The Seven Deadly Sins

Conducted in English. The fall of the Soviet Union has allowed a deluge of once 'sinful' excesses, all of which define Russia's accelerated processes of multiculturalism. This class investigates such 'sins' in the following order: Pride, Covetousness, lust, anger, gluttony, envy and sloth.

RUSS 2151.03: Introduction to Russian Folklore.

Conducted in English. A broad survey of traditional Russian popular beliefs and practices: Proverbs, riddles, and counting rhymes; the rites and rituals of the Russian agricultural year; fairy tales and epic poems (byliny); reconstruction of the Slavic pantheon and its evolution.

***RUSS 2191.03: 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.

FORMAT: Lecture/discussion 2 hours

***RUSS 2270.03: 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.

FORMAT: Lecture/discussion 2 hours

***RUSS 2500.03: Tolstoy.**

Conducted in English. An introduction to the work of this enigmatic spiritual giant of Russian literature. Reading includes *War and Peace*, *Anna Karenina*, and *Resurrection*.

FORMAT: Lecture/discussion 3 hours

***RUSS 2600.03: 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 treasures in this genre.

FORMAT: Lecture/discussion 2 hours

***RUSS 2750.03: 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 as V. Solovyev and N. Berdyaev.

FORMAT: Lecture/discussion 2 hours

***RUSS 2760.03: 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/discussion 2 hours

RUSS 3002.03: Advanced Russian I.

Conducted in Russian. Following a thorough review, this 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/discussion 5 hours

PREREQUISITE: RUSS 2000.06 or equivalent

EXCLUSION: RUSS 3000.06

RUSS 3003.03: Advanced Russian II.

A continuation of RUSS 3002.03.

FORMAT: Lecture/discussion 5 hours

PREREQUISITE: RUSS 3002.03 or equivalent

EXCLUSION: RUSS 3000.06

RUSS 3011.03: Grammar I.

This class is offered in Russian only as part of the Intensive Russian Programme in Russia. Intensive study of the finer points of Russian grammar. Topics include verbs of motion, aspect, impersonal constructions, government and agreement, and other themes.

EXCLUSION: RUSS 3010.06

RUSS 3012.03: Grammar II.

This class is offered in Russian only as part of the Intensive Russian Programme in Russia. Continuation of RUSS 3011.03

EXCLUSION: RUSS 3010.06

RUSS 3029.03: Conversation.

Development of conversational skills and vocabulary building.

FORMAT: Conversation practice

PREREQUISITE: Student must be enrolled in the 3rd year grammar class or must have permission of instructor.

EXCLUSION: RUSS 3010.06

RUSS 3031.03: Conversation.

This class is offered in Russian only as part of the Intensive Russian Programme in Russia. 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.

RUSS 3032.03: Translation.

This class is offered in Russian only as part of the Intensive Russian Programme in Russia. Work on translation of literary, business and journalistic texts.

RUSS 3035.03: Literature: Reading and Analysis.

This class is offered in Russian only as part of the Intensive Russian Programme in Russia. Reading and analysis of literary texts.

RUSS 3090.03: Russian Society Today.

Basic institutions of Russian society are considered in their historical context, with special attention to the role of 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 and some Russian history

RECOMMENDED: RUSS 1000.06, 2nd year Russian, part of the Fall Intensive Russian Programme

CROSS-LISTING: HIST 3090.03/5090.03

RUSS 3092.03: 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", Brezhnev, Gorbachev, and Yeltsin.

INSTRUCTOR: N.G.O. Pereira

FORMAT: Seminar 2 hours

PREREQUISITE: One 2000-level class in history

RECOMMENDED: HIST 2020.06 or RUSS 2022.03/2023.03

CROSS-LISTING: HIST 3092.03

RUSS 3096.03: The History of Ideas in Russia: From Official Nationality to Solzhenitsyn's Neo-Slavophilism.

This class examines some of the main currents in Russian intellectual history from the middle of the nineteenth century through the 1990s. Topics include classical Slavophilism and early Westernism, Populism and Nihilism, Anarchism, Marxism, Leninism, Socialist Realism, anti-Stalinism, Glasnost, neo-Westernism (Sakharov), and neo-Slavophilism (Solzhenitsyn).

INSTRUCTOR: N.G.O. Pereira

FORMAT: Lecture/discussion

RECOMMENDED: HIST 2020.03 or RUSS 2022.03/2023.03

CROSS-LISTING: HIST 3096.03

***RUSS 3102.03: 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 Belkin Tales*, as well as the poetry of Baratynskii, Batiushkov, Del'vig, and Iazykov. No knowledge of Russian is required.

FORMAT: Lecture/discussion

EXCLUSION: RUSS 2100.03

RUSS 3121.03: 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/discussion 3 hours

PREREQUISITE: Two years of Russian

EXCLUSION: RUSS 3120.03

RUSS 3122.03: 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/discussion 3 hours

PREREQUISITE: Two years of Russian

EXCLUSION: RUSS 3120.03

***RUSS 3520.03: Chekhov and Turgenev.**

Conducted in English. Close analysis and discussion of the major works of Turgenev, sensitive portrayer 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/discussion 3 hours

RUSS 3800.03: 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, jejune jokester and tragic poet, realist and fantast". An in-depth study of this major writer.

FORMAT: Lecture/discussion 3 hours

RUSS 4000.06: The Structure of Contemporary Standard Russian.

This class is offered in Russian. Required for honours candidates. 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/discussion 3 hours

PREREQUISITE: RUSS 3000.06 or permission of the instructor

***RUSS 4240.03: 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, Structuralism, Tartu School of semiotics and Bakhtin. 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/discussion 2 hours

EXCLUSION: RUSS 2240.03

***RUSS 4302.03: Russian Poetry.**

Conducted in Russian. 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/discussion

PREREQUISITE: Permission of the instructor

RUSS 4352.03: The Russian Avant-Garde in Music, Literature and Art.

This advanced seminar explores the links and parallels between the structure and thematic innovations forged by composers, writers, and artists of the Russian avant-garde. Figures examined include Musorgsky, Rimsky-Korsakov, Stravinsky, Scriabin, Loure, Roslavets and Mosolov in music; Nekrasov, Leskov, Sologub, Akhmatova, Mandel'shtam, Khlebnikov, Beiy and Maiakovsky in literature; and the "Wanderers," Bilibin Vrubel', the "World of Art" painters, Larionov, Goncharova, Malevich, Tatlin and El Lissitzky in the visual arts.

FORMAT: Seminar

EXCLUSION: RUSS 2061.03

CROSS-LISTING: MUSC 4352.03

RUSS 4950.03, RUSS 4960.03, RUSS 4990.06: 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

Science, Interdisciplinary

Interim Dean

Ryall, P.J.C., BSc (Dal), MSc (Alta), PhD (Dal)

SCIE 1000.06: Introduction to Environmental Studies.

The intention of this full-credit class 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 class content consists of introductory material on basic sciences (biology, earth sciences, atmospheric science and oceanography) and follows with sections on the basic social and health sciences (environmental health, economics, philosophy, politics and law). The class is multi-disciplinary, with both specialists and guest lecturers dealing with issues which reflect their particular expertise and experience. Four aspects of environmental studies underlie much of the class content: (1) Anthropogenic (human induced) environmental effects; (2) Sustainability and the use of renewable and non-renewable resources; (3) Environmental degradation caused by ecological disturbance and pollution; and (4) The interaction of the ecosystem approach to development with other approaches.

The class stresses the connections among specific disciplines of both the lecturers and the students. There are two lectures per week, plus 8 tutorials on environmentally relevant topics. Tutorial assignments count for about 35% of the grade, 6 quizzes for 35%, an individual term project for 20%, and an examination at the end of the A term for 10%.

INSTRUCTORS: O. Hertzman, staff

SCIE 3000.06: Science Fundamentals.

SCIE 3000.06 is an interdisciplinary class for Honours students and fourth year Advanced Major 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 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.

INSTRUCTORS: D.B. Clarke and others

FORMAT: Writing Intensive, lecture 3 hours

RESTRICTION: Third- and fourth-year Honours students and fourth year Advanced Major students in the Faculty of Science

SCIE 4000.03: The History of Modern Science.

Science became separated from general knowledge about 1500 and the early 19th century. It has proved to be a remarkably powerful cultural force from the time of the first Scientific Revolution of the 17th century until our own times. This class examines the ways that science and scientists have given us knowledge of the natural world from the time of Copernicus to the development of evolutionary theory and relativistic physics in the 19th and 20th centuries. It is intended for students interested in interdisciplinary knowledge who are prepared for extensive reading.

INSTRUCTOR: E. L. Mills

FORMAT: Lecture 3 hours

CROSS-LISTINGS: BIOL 3402.03, HIST 3072.03

SCIE 4001.03: History of Marine Sciences.

This class describes the development of the marine sciences from biological, chemical, physical and geological knowledge going back to the 17th century or earlier. It includes the important voyages of exploration, the development of marine biology, ocean circulation and plate tectonics, also the importance of technological changes upon marine science.

INSTRUCTOR: E.L. Mills

FORMAT: Lecture 3 hours

PREREQUISITE: Instructor's consent

CROSS-LISTINGS: BIOL 4664.03, OCEA 5331.03, SCIE 4001.03

SCIE 8700.00: Science Co-op Seminar.

This seminar is designed to introduce the science co-operative education student to aspects of career development in preparation for their first work placement. Topic areas include: resume writing, interview skills, employment law, preparation of written reports, work safety skills, and conflict management. This seminar is offered in the Fall and Winter terms only.

INSTRUCTORS: C. Cottingham and others

FORMAT: Seminar 2 hours

RESTRICTION: Restricted to students enrolled in the Science Co-operative Education Programme

Other Related Classes

The following classes address the subject matter in an Interdisciplinary manner. Consult department listings for full descriptions.

BIOL 3601.03: Nature Conservation

CHEM 3303.03: Materials Science

COMP 1000.03: Microcomputer Applications

ECON 2251.03: Applied Development Economics I

ECON 2252.03: Applied Development Economics II

ECON 3338.03: Introductory Econometrics I

MATH 1001.03/1002.03: Mathematics for Liberal Arts Students

MATH 2600.03: Theory of Interest

Social Work

The Maritime School of Social Work

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(at Oxford Street)
Halifax, NS B3H 3J5
Telephone: (902) 494-3760
Fax: (902) 494-6709

Dean

McIntyre, L., MD, MHSc, FRCP(C)

Programme Information

Densmore, J., Coordinator of Admissions and Student Services

Academic Staff

Director

Drover, G., BA (Uof T), MSW (Fordham), PhD (London School of Economics)

Professors

Carlson, R.W., BA, MSW (Penn) PhD (Chicago)
Drover, G., BA (UofT), MSW (Fordham), PhD (London School of Economics)
Wien, F.C., BA (Queen's), MA, PhD (Cornell)

Associate Professors

MacDonald Slipp, G., BA (Dal), MSW (King's)
Gilroy, J., BA (Dal), MSW (King's), MA (Tor)
O'Day, R., BA (UBC), MA, PhD (Michigan)

Assistant Professors

Baines, D., BSW (Carlton), MSW (Calgary)
Duplisa, J.B., BA, MSW (MtA)
Harbison, J.R., BA, BSS (Dublin, Trinity College), Grad. Dip. SW (Edinburgh), PhD (Tor)
MacDonald, M., BA (St.FX), BJ (Carleton), MSW (Dal), PhD (Warwick)
Neal, R., BA/BSW (McM), MA (OISE/UofT), PhD (Tor)
Richard, B.K., BA (MtA), MSW (Dal)
Sexton, A., BA (Honours) (St. Thomas), MSW (Dal)
Thomas-Bernard, W., BA (MSVU), MSW (Dal), PhD (Sheffield)

Lecturers

Campbell, C., BSc (King's), BEd, SpecEd (Acadia), MSW (Carleton)
Ceccolini, J., BA (Dal), BEd (St. Mary's), MSW (Dal)
Cummings, J., BA (Dal), MSW (St. FX), PhD (Tor)
Lucas, S., BSW, MSW (Dal)
MacDonald, M.J., BA (UNB), MSW (Dal)
Moore, M., Dip. Social Studies (London), BA, MA (Dal), PhD (Boston)
Nasser, S., BA, BSW (McG), MSW, MPH (Minn)
O'Hara, P., BA (St. Thomas), MSW (Dal)
Peers, M., BA (Western), MSW (Dal), LLD (Dal)
Williams, D., AB (Chico), MSW (Berkeley), PhD (Brandeis)

Sessional Faculty and Agency Field Instructors

Many individuals throughout the municipality and the province contribute to the education of Social Work students in two levels of field placements. Their invaluable assistance is gratefully acknowledged. Names can be obtained by contacting the Director's Office, Maritime School of Social Work.

I. 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. It has since become one of eight constituents of the Faculty of Health Professions. 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 classes in the humanities and social sciences, and more specialized classes 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 analyses of human behaviour and social environment provide a foundation for the development of skills for assisting people to cope more effectively with problems and for supporting broader social change.

The School also offers a Master's degree programme for advanced, specialized study in Social Work practice, and a Continuing Education programme of thematic provincial workshops.

Both the undergraduate and graduate programmes are accredited by the Canadian Association of Schools of Social Work.

A. Nova Scotia Association of Social Workers

Provincial legislation requires that persons cannot practice as social workers unless they are registered with the Nova Scotia Association of Social Workers. To become fully registered and use the title of Social Worker after obtaining the BSW degree, at least 3,859 hours of paid supervised social work experience is necessary, followed by an examination established by the Board of Examiners, NSASW.

Information about the Social Workers Act or the Association may be obtained from the Registrar, NSASW, at (902) 429-7298.

B. 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 University grade point average system is described in the Academic Regulation 19, Academic Standing, pg. 29 of this calendar. Faculty of Health Professions academic regulations apply to the BSW degree requirements.

Students require a cumulative GPA of 2.0 to graduate. In addition, the Maritime School of Social Work regulations specified in Items B.2 and B.3 below also apply.

2. Grade Requirements for Social Work Classes

The minimum grade requirement for satisfactory completion of a Social Work class is C-. A student who earns a grade of less than C- but is otherwise still eligible to continue in the programme must repeat the class until a grade of at least C- is attained. Social Work classes are all classes taken under BSW study other than those designated as general admission credits.

3. Grade Requirements for Field Instruction Classes

Field Practice classes SLWK 3020.06 - Field I and SLWK 4030.12 - Field II are graded on a pass/fail system. A student who receives a failing grade in SLWK 3020.06 - Field I, must repeat the field instruction/placement and obtain a passing grade in order to be eligible to proceed in the programme. Field II cannot be repeated.

4. Required Withdrawal: Academic Dismissal

- A student who fails to meet sessional GPA standards as defined in the Academic Regulations section of this calendar must withdraw from the School.
- A student who fails a repeated academic class or who fails a repeat of SLWK 3020.06 - Field I, must normally withdraw from the School.
- A student who fails SLWK 4030.12 - Field II is required to withdraw from the School.

5. Required Withdrawal on Grounds of Unsuitability
Please refer to University Regulation E. Suspension or Dismissal on the Grounds of Professional Unsuitability - Faculty of Health Professions (pg. 30).

6. Readmission

Because of the relation of the BSW programme to the attainment of professional qualifications, each application for readmission 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. Programme requirements for reaccepted students may be adjusted effective from the date of readmission.

7. Readmission After Required Withdrawal

Students who have been required to withdraw from the School of Social Work on the basis of academic dismissal may apply for readmission by the annual March 1st admissions deadline date that follows a minimum of twelve month's absence from the School. Since enrolment in the programme is limited, applicants must understand that readmission is not automatic.

8. Readmission After Voluntary Withdrawal

Students in good standing who have not registered in the programme for two years or less 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 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. Former students who have less than the five general admissions credits, which are now required on entry, must complete these before reapplying. (See Admissions Requirement G.7 - Maritime School of Social Work (pg. 14) of this calendar.

9. 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.

10. Duration of Undergraduate Study

Students are normally required to complete the BSW degree within 10 years of their first registration (see Academic Regulation 17.2 - Duration of Undergraduate Studies pg. 27).

11. Workload Regular Academic Year

Five (5) full-credit classes per academic year 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). In addition to the regular timetable, labs or workshops may be offered throughout the fall/winter terms.

For Spring/Summer Session workload see Academic Regulation 4.2 (pg. 24).

II. Bachelor of Social Work Degree Programme

A. Admission

The BSW programme requires three years of full time study for persons entering with the minimum academic prerequisite of five general non-social work credits. Persons holding an undergraduate degree on entry which provides suitable preparation for the study of Social Work normally may complete the programme in two full-time years or the equivalent on a part-time basis.

Enrolment is limited to a specified number of places that are offered once a year to the best qualified candidates, selected by the School's admissions process. Equal consideration is given to part-time and

full-time applications. Information on recommended academic preparation, and information on admissions and application procedures is contained in the Admissions Requirements - Faculty of Health Professions - Maritime School of Social Work section, near the front of this calendar.

B. Students in Other Degree Programmes

For students enrolled in Faculty of Health Professions degree programmes, a limited number of places are available in the non-restricted Social Work classes (SLWK 3011.03, 3012.03, 3050.03, 3081.03, 3082.03, 3090.03, 3100.03), provided that the home School/Department approves the class for credit towards the current degree. Students are not otherwise permitted to select Social Work classes.

C. Special Students "Non-Degree"

Social Work classes are not available to special "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.

D. Audit by Agency Field Instructors

The MSSW permits Agency Field Instructors to audit Social Work classes. Prior permission of the instructor concerned is required. In order for the audit to show on a University transcript, the agency field instructor must abide by the audit and fee regulations as outlined in Academic Regulation 11. Audit of Classes, pg. 26.

E. 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 includes 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.

Upon completion of the BSW programme, students will:

1. Be provided with the knowledge base to understand human development and social conditions, and the skills to analyze policies and political forces that influence human lives, including their own and those of users of social services, and that also shape health and social welfare services. This includes an understanding of systemic inequality in resources and power rooted in diverse factors such as class, gender, sexual orientation, race, ethnicity, disability, age, and regional underdevelopment.
2. Be aware of a range of social work theories and practice methods.
3. Be able to practice in accordance with social work values and ethics.
4. Be able to use their knowledge, analytical abilities and values to develop a beginning competence in social work interventions which are effective and demonstrate accountability to users and providers of services and to professional standards and ethics.
5. Be able to integrate theories, values, analytical and practice methods into a framework or approach to social work practice which they can articulate and use as a foundation for ongoing learning and professional development.
6. Be prepared for generic social work practice that incorporates fundamental concerns for social justice.

F. Relationship to the MSW Programme

The BSW provides the academic prerequisite 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 relevant postbaccalaureate social work experience.

G. Full-time and Part-time Studies

A full-time programme of study usually consists of 5 credits (i.e. 30 credit hours) during the regular Fall/Winter session.

Part-time study may consist of 0.5 to 3.0 credits (i.e. 3 to 18 credit hours) during the Fall/Winter session.

Required academic classes are scheduled in the late afternoon or evening. 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 outside their regular place of employment.

H. Transfer Credit

Transfer credit is assessed on an individual basis according to established School policy. It is the student's responsibility if requested to provide class outlines and other documentation required by the School for the purpose of determining eligibility. The student's selection of classes is subject to the assignment of transfer credit.

I. 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 who transfer from other BSW programmes are governed by the regulation that any student with a previous degree is required to complete a minimum of six credits under Dalhousie instruction, and that any student without a degree is required to complete a minimum of seven and one-half credits under Dalhousie instruction.

Students generally fit into either a two-year, three-year or partial three-year BSW programme, as follows:

Two-Year (10-Credit) Programme

Entrants with a previous undergraduate degree and a cumulative GPA of 2.70, (B- minimum) 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 2000.06: Introduction to Social Work Practice (1 credit)
SLWK 3020.06: Field Instruction I (1 credit)
SLWK 3030.06: Foundation of Social Work Practice (1 credit)
SLWK 3220.03: Cross-Cultural Issues and Social Work Practice (0.5 credit)
SLWK 4010.06: Advanced Social Work Practice (1 credit)
SLWK 4030.12R: Field Instruction II (2 credits); and
- (b) Three and one-half core credits remaining after the assignment of transfer credit to the 5.5 credits listed below, to be confirmed with the student during the first week of September:
SLWK 2010.03: An Introduction to Community Development (0.5 credit)
SLWK 3011.03: Perspectives on Social Welfare Policy I (0.5 credit)
SLWK 3012.03: Perspectives on Social Welfare Policy II (0.5 credit)
SLWK 3050.03: Social History of Atlantic Canada (0.5 credit)
SLWK 3070.03: Social Service Delivery Analysis (0.5 credit)
SLWK 3081.03: Science and Testing of Practice I (0.5 credit)
SLWK 3082.03: Science and Testing of Practice II (0.5 credit)
SLWK 3090.03: Social Statistics (0.5 credit)
SLWK 3100.03: Political Economy of Social Welfare in Canada (0.5 credit)

Three-Year (15-Credit) or Partial Three-Year Programme

Entrants with 5 eligible general academic credits only 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 listed below.

Social Work in a Special Field of Practice Elective (0.5 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 two 0.5 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 (1.5 credits or three 0.5 credits): Free electives may be chosen from any subject area, including Social Work.

Entrants with more than 5 and less than 15 eligible academic credits complete a partial three-year programme, whereby the number of required Social Work credits is reduced by the number of approved transfer credits, which together total 15 credits (e.g. 1.5 transfer credits reduce the required Social Work content to 13.5 credits). As a general rule, transfer credits eliminate free elective content first and Social Work core content last.

J. Sequencing of Class 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 2000.06: Introduction to Social Work Practice - is the first class to be completed by part-time students;
- (ii) SLWK 2010.03: An Introduction to Community Development, is to be taken prior to or concurrently with SLWK 4010.06: Advanced Social Work Practice, and is preferably included in the first five credits of the student's programme;
- (iii) SLWK 3020.06: Field Instruction I, is to be taken early in the student's programme, and must be completed prior to enrolment in SLWK 4030.12: Field Instruction II;
- (iv) SLWK 3030.06: Foundations of SW Practice, is to be completed prior to the commencement of SLWK 4010.06: Advanced SW Practice; and, if possible, after completion of SLWK 2000.06: Intro;
- (v) SLWK 4010.06: Advanced SW Practice, is to be taken prior to or concurrently with SLWK 4030.12: Field Instruction II;
- (vi) SLWK 4030.12: Field Instruction II, is normally to be taken at the end of the part-time student's programme.

Full-time students in the two-year programme complete SLWK 2000.06, and 3030.06 in year 1 and SLWK 4010.06 in year 2; full-time students in the three-year programme complete SLWK 2000.06 in year 1, SLWK 3030.06 in year 2, and SLWK 4010.06 in year 3.

K. New Student Advising Sessions

New students are expected to attend at least one orientation group session during the first week of September prior to the commencement of classes. Confirmation of each student's curriculum requirements including the assignment of transfer credit is normally available at this time. The possible assignment of competency credits to be earned in the coming months is also discussed. Opportunity to meet individually with a curriculum advisor and the competency credit coordinator is available to each new student during the orientation days.

L. Faculty Advisors

Each student is assigned a faculty advisor for ongoing consultation concerning any issues or concerns that may arise throughout the year. For new students, the faculty advisor is the instructor of their SLWK 2000.06 class. For students enrolled in SLWK 4030.12: Field Instruction II, or SLWK 3030.06, the faculty field instructor also serves as the faculty advisor. Other students are assigned a faculty advisor early in the Fall session.

M. 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 0.5 credit to a maximum of 2 credits is possible. Eligibility is determined by the credit for competency coordinator.

New students may 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 SLWK 2000.06: Introduction to Social Work. A fee equal to half the regular fee for a 0.5 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.

N. Equipment

Throughout the programme of study, some development of computer skills will be included. Social Work students are expected to make use of the computer labs and related resources which include assistance in getting started, available on the main Dalhousie campus. Computers for student use are also located at the School.

All students should have access to a portable tape recorder for use in field instruction. Students may be expected to have the use of a car in order to do their field placements.

O. Field Instruction

All part-time and full-time students are required to undertake the two field placements (SLWK 3020.06 and 4030.12) normally 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 applying content from academic classes.

III. Classes Offered

SLWK 2000.06: Introduction to Social Work Practice. (compulsory)

As the first practice class in the BSW programme, this class offers students a beginning examination of topics and issues that will be examined in greater depth in other classes during their BSW studies. The overall goal of the class is to facilitate the development of a social work practice which is grounded in: (a) an understanding of power and oppression, and (b) an understanding that the experience of social work varies depending upon the age, gender, race, ethnicity, sexual orientation, class and ability of clients and workers.

INSTRUCTOR: TBA

FORMAT: Lecture/discussion 2.5 hours per week, workshop 15 hours per term

RESTRICTION: Restricted to Social Work students

SLWK 2010.03: An Introduction to Community Development.

Community Development within social work is the facilitation of meaningful change within communities to improve the quality of life for members of those communities. Using lectures, guest speakers and case studies, this class will discuss various elements of the change process and examine specific change strategies.

INSTRUCTOR: TBA

FORMAT: Lecture/discussion 2.5 hrs

PRE/CO-REQUISITE: SLWK 2000.06

RESTRICTION: Restricted to Social Work students

SLWK 3011.03: Perspectives on Social Welfare Policy I.

This class provides a survey of the history of social welfare in Canada, with a focus on historical debates which shed light on present-day issues.

INSTRUCTOR: TBA

FORMAT: Lecture/group discussions

SLWK 3012.03: Perspectives on Social Welfare Policy II.

As an introduction to social policy analysis, this class provides a survey of a variety of perspectives on social problems and social policy issues, with a focus of contemporary debates.

INSTRUCTOR: TBA

FORMAT: Lecture/group discussions

SLWK 3020.06: 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, small groups, and community practice settings. 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.

Field I should be completed early in the student's programme.

RESTRICTION: Restricted to Social Work students

SLWK 3030.06: 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.

INSTRUCTOR: TBA

FORMAT: Lectures, small and large group discussions, student presentations, role plays

PRE/CO-REQUISITE: SLWK 2000.06

RESTRICTION: Restricted to Social Work students

SLWK 3050.03: 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.

INSTRUCTOR: TBA

FORMAT: Seminar 2.5 hours

SLWK 3070.03: Social Service Delivery Analysis.

(Not offered in 1998-99)

The class 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: TBA

FORMAT: Lecture/small groups

SUBSTITUTE: A Social Work in a Special Field of Practice elective or an interdisciplinary class related to social work practice can be substituted for this class.

RESTRICTION: Restricted to Social Work students

SLWK 3081.03: Science and the Testing of Practice I.

The use of research in social work practice is explored considering systematic ways in which practice can be evaluated. Use of single-subject designs, structured assessments, well-defined databases and other forms of systematic inquiry are considered. The role such research might play in developing practice assumptions is discussed.

INSTRUCTOR: TBA

FORMAT: Discussion/group projects 2.5 hours

SLWK 3082.03: Science and the Testing of Practice II.

The use of research to increase understanding of social programmes and social problems is the focus of this class. Consideration is given to the nature of the scientific method and commonly used approaches to such research. The interrelationship between theory, research and practice is explored. Particular attention is given to biases frequently encountered in the use and non-use of research in planning and implementing social programmes.

INSTRUCTOR: TBA

FORMAT: Discussion/group projects 2.5 hours

SLWK 3090.03: Social Statistics (not offered in 1998-99 regular session).

This class 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: TBA

FORMAT: Lecture

SLWK 3100.03: Political Economy of Social Welfare in Canada.

This class offers an introduction to the analysis of structural oppression along the axes of class, gender, race and ability, especially the tension between universality as a policy goal and respect for diversity. Specific attention is focused on strategies of affirmative action, pay equity, discriminatory harassment and licensure.

INSTRUCTOR: TBA

FORMAT: Lecture/small groups

PREREQUISITE: SLWK 3012.03 preferable

SLWK 3220.03: Cross-Cultural Issues and Social Work Practice.

(compulsory)

This class 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: TBA

FORMAT: Seminar 2.5 hours

RESTRICTION: Restricted to Social Work students

SLWK 4010.06: 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: TBA

FORMAT: Lecture/small groups 2.5 hours

PREREQUISITE: SLWK 2000.06, SLWK 3020.06, SLWK 3030.06 (recommended)

RESTRICTION: Restricted to Social Work students

SLWK 4030.12: 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 intervention, 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 develops a proposal for submission to the School and approval by the Field Coordinator prior to beginning the practicum. The Field II proposal must be submitted in the spring for the following academic year.

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. Field manuals are available to aid the student in preparing for the placement, as well as outlining the expectations for satisfactory completion of the practica.

The Field II practicum is done at or near the end of a student's programme. Minimum requirement: 500 hours. Proposals should be sent to: Field II Coordinator, Maritime School of Social Work, Dalhousie University, Halifax, NS B3H 3J5.

RESTRICTION: Restricted to Social Work students

IV. Credits for Competency

SLWK 2500.03: (A) Learning Through General Work Experience.

SLWK 2510.03: (B) Self Analysis and Personal Development.

SLWK 2520.03: (C) Specific Social Work Skills .

SLWK 2530.03: (D) Non-credit Structured Learning Experiences .

SLWK 2540.03: (E) Knowledge of Special Field of Practice .

Eligible students complete A, and one to three of B, C, D and E, depending on their academic background and related work experience.

Students taking SLWK 2000.06 who are eligible to apply for an exemption from Field I are required to complete topics A and C.

V. Social Work in a Special Field of Practice Electives

Two elective classes, one in each term, are offered each year from the following:

SLWK 3170.03: Feminist Counselling.

CROSS-LISTING: WOST 3855.03

SLWK 3200.03: Law and Social Work.

SLWK 3250.03: Social Work in Corrections.

SLWK 3270.03: Social Work in Addictions.

SLWK 3290.03: Counselling in Social Work Practice.

SLWK 3300.03: Independent Study.

SLWK 3320.03: Social Work and Aging.

SLWK 3350.03: Social Work with Groups.

SLWK 3370.03: Child Welfare.

SLWK 4380.03: Disability Policy & Service.

Sociology and Social Anthropology

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Chair
Morgan, J.G. (494-2069)

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Professors
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Barkow, J.H., AB (Brooklyn), AM, PhD (Chi)
Binkley, M.E., BA, MA, PhD (Tor)
Clairmont, D.H., BA, MA (McM), PhD (Wash U), McCulloch
Professor in Sociology and Social Anthropology
Thieasen, V., BA (Man), MA, PhD (Wis)

Associate Professors
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Li, T.J., BA, PhD (Cantab)
Miller, V.P., BA (Calif), MA, PhD (Calif)
Morgan, J.G., BA (Nott), MA (McM), DPhil (Oxon)
Murphy, C.J. BA (St. FX), MA (Dal), PhD (Tor)
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Assistant Professors
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DuBois, L., BA (McG), MA, PhD (New School for Social Research)
Findlay, D., BA, BSW, MA, PhD (McM)
Jarman, J., BA, MA (Tor), PhD (Cantab)
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I. 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 and Social Anthropology provide an academic training which is rigorous and cosmopolitan. Students develop research skills along with a general intellectual preparation which stands them in good stead for graduate work in the disciplines or for a broad range of professions such as law, medicine, social work or journalism.

A. Sociology

From its inception in the nineteenth century, sociology has been concerned with understanding the growth and evolution of modern societies. Classical sociologists attempted to identify universal laws of human behaviour which would help them to understand the nature of social change and of social order, the role of the individual

vis-a-vis the broader society, and the production and reproduction of social inequalities. While contemporary sociologists have abandoned the search for universal laws, the discipline continues to study the social context of human action, and has contributed substantially to knowledge and understanding of our own world.

B. Social Anthropology

Anthropology is composed of four subfields, social/cultural, archaeological, biological, and linguistic. The strength of our programme is the concentration upon Social Anthropology, the area most complementary to Sociology. Social Anthropology, with its emphases on global context, continuity and change, questions of human and group identity, and views on human nature, may focus on local cultures or entire civilizations. For example, some Social Anthropologists study historical and contemporary conditions of indigenous groups, tribal or peasant societies, others conduct their research within industrial societies. Our programme provides the opportunity for students to become conversant with the comparative cultural implications of modern societies such as different forms of family and kinship practices, changing gender relations, the organization of work, law and social injustice, medicine and health, religion, and political economy. How do people in different places and times react, resist, and adapt to change?

II. Degree Programmes

The department's BA degree programme is offered as a 15 credit major or a 20 credit advanced major in Sociology and Social Anthropology. The BA honours degree is offered through more specialized programmes of study in Sociology or in Social Anthropology. Dalhousie graduates wishing to upgrade from a 15 credit major may complete an additional five credits to be awarded the Advanced Major Conversion or the Honours Conversion. An honours degree is normally the required preparation for graduate study.

All Bachelors degree programmes are governed by the general Requirements for Degrees set out in the University Calendar, in addition to the departmental requirements stated below. See "Degree Requirements" section for complete details.

NOTE: Revisions to the requirements for all degree programmes were made in 1994. Students who registered in the honours programme before 1994 should consult the Undergraduate Advisor about changes to their programme to meet new requirements. Majors and honours students who have already taken any one of the previously required classes SOSA 2010.03, SOSA 2240.03, SOSA 2250.03, SOSA 2011.0, are exempted from the 2000 level requirements stated below.

NOTE:

- No more than one credit may be obtained for introductory classes from SOSA 1000.06, 1050.06, 1100.06, 1200.06.
- For purposes of gaining entry to 2000 and 3000 level SOSA classes, King's Foundation Year satisfies the introductory class prerequisite.
- If they so elect, King's Foundation Year students may also obtain credit for one introductory class from SOSA 1000.06, 1050.06, 1100.06, or 1200.06.
- Students may obtain credit for both SOSA 2001.06 and 2002.06, and those proposing to apply to the honours programme are particularly encouraged to acquire a foundation in both disciplines.

A. Honours BA Programme

The Department's honours programmes are designed for students with an interest in, and demonstrated aptitude for, advanced study in either Sociology or Social Anthropology. Admission to these programmes is based solely on academic performance. More specifically, the Department requires a grade average of B+ (3.30) or higher on classes above 1000 in SOSA and the minor (or second major) subject. In addition, a minimum cumulative GPA of 2.70 is required. Potential applicants should consult with the Department's Undergraduate Advisor, preferably during their second year of study, and should plan to take the 3000 level classes required for

honours during their third year. The Advisor will assist the student to design a programme of study with a concentration in Social Anthropology or Sociology meeting the general Faculty requirements and the specific requirements for each programme as set out below. The honours thesis paper is produced for the class SOSA 4500.06 (Sociology) or SOSA 4000.06 (Social Anthropology). This fulfills the College of Arts and Science Honours Qualifying Examination requirement. 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. Combined and unconcentrated honours programmes may be arranged in consultation with the Undergraduate Advisor and the other departments concerned. See College of Arts and Science Regulations 1.3 for general information and requirements.

NOTE: The Department expects its honours students to be computer literate prior to their third year of study. Instruction in two of the required classes, SOSA 3402.03 and 3403.03 assumes that students possess basic computer skills. Potential honours applicants who have not already acquired such skills are urged to enrol in one of the following classes: ASSC 1000.03, COMP 1000.03 or COMM 1501.03.

Departmental requirements

Classes required in Concentrated Honours in Social Anthropology:

1000 level

- One of: SOSA 1000.06, 1050.06, 1100.06, 1200.06, or King's Foundation Year Programme.

2000 level

- SOSA 2001.06 or 2002.06
- At least one additional 2000 level credit.

3000 level

- SOSA 3400.03
- SOSA 3402.03
- SOSA 3403.03

4000 level

- SOSA 4003.03
- SOSA 4000.06
- A minimum of one additional SOSA 4000-level seminar (0.5 credit).

In total a minimum of nine (9) and a maximum of eleven (11) SOSA credits beyond the 1000 level are required.

Classes required in Concentrated Honours in Sociology:

1000 level

- One of: SOSA 1000.06, 1050.06, 1100.06, 1200.06, or King's Foundation Year Programme.

2000 level

- SOSA 2001.06 or 2002.06
- At least one additional 2000 level credit.

3000 level

- SOSA 3402.03
- SOSA 3403.03
- SOSA 3401.03
- SOSA 3405.03

4000 level

- SOSA 4003.03 or 4001.03
- SOSA 4500.06
- A minimum of one additional SOSA 4000-level seminar (0.5 credit).

In total a minimum of nine (9) and a maximum of eleven (11) SOSA credits beyond the 1000 level are required.

NOTE: Students considering graduate work in Sociology are strongly advised to take either MATH/STAT 1060.03 or SOSA 4002.03: Social Statistics, since statistical competence is often required as a component of graduate social science programmes.

B. Honours Conversion in Sociology or Social Anthropology

This programme permits Dalhousie graduates to undertake an additional five credits upgrading their qualifications from Major to Honours. Students must meet the usual conditions for admission to honours, and complete the full set of Honours requirements in either Sociology or Social Anthropology. Interested students should consult the Undergraduate Advisor.

C. Advanced Major in Sociology and Social Anthropology

Departmental requirements

1000 level

- One of: SOSA 1000.06, 1050.06, 1100.06, 1200.06, or King's Foundation Year Programme.

2000 level

- Either SOSA 2001.06 or 2002.06
- At least one additional 2000 level credit.

3000/4000 level

- Total of three full SOSA credits.

In total a minimum of 6 and a maximum of 9 SOSA credits beyond the 1000 level are required.

D. Advanced Double Major Degree

Students must obtain at least ten and no more than thirteen credits beyond the 1000 level in two allied subjects, with no fewer than four and no more than nine in either.

1000 level

- One of: SOSA 1000.06, 1050.06, 1100.06, 1200.06, or King's Foundation Year Programme.

2000 level

- Either SOSA 2001.06 or 2002.06
- At least one additional 2000 level credit.

3000/4000 level

- Total of two full SOSA credits.

E. Advanced Major Conversion

This programme permits Dalhousie graduates to undertake an additional year of study upgrading their qualifications from Major to Advanced Major. Students must meet the full set of Advanced Major requirements.

F. Major in Sociology and Social Anthropology

Departmental Requirements

1000 level

- One of: SOSA 1000.06, 1050.06, 1100.06, 1200.06, or King's Foundation Year Programme

2000 level

- Either SOSA 2001.06 or 2002.06
- At least one additional 2000 level credit

3000 level

- Total of two full SOSA credits

In total, a minimum of 4 and a maximum of 8 SOSA credits beyond the 1000 level are required.

G. Interdisciplinary Studies

The department cooperates with other departments in the Faculty to offer three interdisciplinary programmes. Some classes are cross listed. Students interested in these programmes may like to consider double advanced major or combined honours degrees, with Sociology and Social Anthropology as a component. Consult the Undergraduate Advisor for details of the following programmes:

- Canadian Studies (Major)
- International Development Studies (Major and Honours)
- Women's Studies (Major and Honours)

III. Classes Offered

Some classes listed may not be offered in a given academic year. Consult the timetable for details. Where prerequisites apply, students requesting exceptions must obtain permission directly from the instructor involved.

NOTE: Enrolment in 4000 level classes is restricted to Honours and Advanced Major students in their fourth year of study.

SOSA 1000.06: Culture and Society.

An introduction to the comparative study of human society from the parallel perspectives of Sociology and Social Anthropology.

FORMAT: Lecture 3 hours

EXCLUSION: SOSA 1050.06, 1100.06 and 1200.06

SOSA 1050.06: Explorations in Culture and Society.

What are culture and society? How do we study and understand them? In beginning to answer these questions, the course introduces students to the key concepts, perspectives and methods of sociology and social anthropology. Taking examples from Canada and around the globe, we will look at such topics as beliefs, values, power, social structure, economy and more. This class fulfills the first-year writing requirement. It also satisfies the prerequisite for enrolment in upper level classes in sociology and social anthropology. Students are required to register for one of the scheduled tutorials.

FORMAT: : Writing Requirement, lecture 2 hours, tutorial meeting 1 hour.

EXCLUSION: SOSA 1000.06, 1100.06, or 1200.06.

SOSA 1100.06: 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

EXCLUSION: SOSA 1000.06, 1050.06 and 1200.06

SOSA 1200.06: 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 may 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

EXCLUSION: SOSA 1000.06, 1050.06 and 1100.06

SOSA 2001.06: Ethnography in a Global Context.

Ethnography describes how people conduct their lives in a particular time and place. This class examines the challenge, complexity, strengths, and limitations of ethnographic knowledge and writing in Social Anthropology. Students will learn about a number of different ethnographic settings which may vary from year to year. A selection of ethnographies, films, autobiographical writing, and critical commentaries will be used to reveal how social anthropologists generate ethnographic knowledge about past and present societies, and why research priorities shift. Approved with International Development Studies.

FORMAT: Lecture 3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

SOSA 2002.06: The Sociological Perspective: Thinking and Doing Sociology.

Sociologists are interested in understanding the social world. They do not rely on preconceived ideas alone to enrich this understanding, but see the need to conduct studies, carry out investigations, make observations, analyze findings, formulate ideas, and construct theories and interpretations about what they find. This class looks at the ways sociologists go about their work.

What are some of the dominant ways of thinking current in sociology today? What are the relationships between such ways of thinking and what are seen as questions to investigate? How do sociologists do their research? What are social surveys, interviews, theories, sociological ideas? What is distinctive about a sociological way of looking at a problem?

FORMAT: Lecture 3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

SOSA 2161.06: Tinker, Tailor, Soldier - Work and Occupations in a Changing World.

Work is a fundamental aspect of all human societies and a key aspect to the development of social inequalities, be they based on gender, class, ethnicity, or cultural difference. Work has been seen as a main component of an individual's identity, but what do we mean by work? Against a backdrop of international and historical patterns, this class considers the changing nature of work and occupations. Topics which may be covered include: agrarian societies; home based labour; work patterns in family life; labour migration and citizenship; international divisions of labour; shifts in occupational structures such as shop floors, typing pools, or professions; managerial and union strategies; the relationship between education and employment; and, how occupational status, employment, and unemployment limit or enhance a person's political power. Approved with International Development Studies.

FORMAT: Lecture 3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

EXCLUSION: SOSA 2160.03

CROSS-LISTING: WOST 2400.06

SOSA 2180.06: Sociology of Crime and Criminal Justice.

How much crime is there? Why is it increasing? Are criminals different? Can we control or prevent crime? Criminology attempts to answer these questions through the social scientific study of crime and criminal justice as a social phenomena. This course introduces students to a broad variety of critical thinking, research and descriptive material on thematic issues such as the social causes of crime (e.g. poverty, culture, power, socialization), different types of crime (e.g. public, private and corporate), the structure and impact of the criminal justice system (e.g. police, courts and corrections) and public policy options and debates (e.g.. capital punishment, Young Offenders Act, decriminalizing of drugs and prostitution). This class provides a general understanding of the sociology of crime and criminal justice and a sound basis for further study in the area of social order and human justice.

FORMAT: Lecture 3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

EXCLUSION: SOSA 2181.03, 2182.03

SOSA 2190.06: 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. Themes around which the class will be organized include the relationship between gender and the following: culture and difference; sexuality and reproduction; labour; gender politics, power relations and political discourse; and gender in the global political economy. Approved with International Development Studies.

FORMAT: Lecture 3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

CROSS-LISTING: WOST 2800.06

SOSA 2200.06: The Family in Comparative Perspective.

This class examines the family as a cultural, political and economic institution. It questions the familiar. What is the family? Is it universal? How have families changed? Why are families so diverse? why do people marry? Why do they have children? Why is a woman's work never done? Is the family in a state of crisis? Adopting a comparative perspective, and using concepts from

anthropology and sociology, the class addresses these questions in a global context, drawing upon data and examples from Canada and around the world.

FORMAT: Lecture 3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

SOSA 2300.06: 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: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

SOSA 2400.06: Health and Illness 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 versus 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. Approved with International Development Studies.

FORMAT: Lecture 3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

SOSA 2401.06: Food and Eating 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 is an introduction to the anthropology and sociology of food. Topics include evolution and human nutrition, social change and food, famine and the world food system, food in contemporary film, food taboos, age and gender differences in food prescriptions and proscriptions, dieting and obesity, cannibalism, the symbolic meaning of eating and food, and vegans vs. carnivores. Approved with International Development Studies.

FORMAT: Lecture 3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

EXCLUSION: SOSA 2003.06 (1996/97)

SOSA 2501.06: 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: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

EXCLUSION: SOSA 2500.03

SOSA 3002.03: Native Peoples of Canada.

This class uses an ecological perspective to describe the cultures and peoples occupying Canada at the time Europeans came to this continent. As time permits, some ethnohistory and the situation of contemporary Native peoples is also discussed. Films will be used to supplement lectures and readings.

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

EXCLUSION: SOSA 2350.03

SOSA 3003.03: Native Peoples of the United States.

This class uses an ecological perspective to describe the cultures and peoples occupying the United States at the time Europeans first came to this continent. As time permits, some ethnohistory and the situation of contemporary Native peoples is also discussed. Films will supplement lectures and readings.

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

EXCLUSION: SOSA 2360.03

SOSA 3005.03: Does Industrial Society Have a Future?: Knowledge, Work, and Culture in the Contemporary World.

Since the publication of Daniel Bell's book, *The Coming of Postindustrial Society*, studies of the economic structure of the advanced societies have addressed the question of the extent to which we are living through a transition to a new, knowledge-driven economy which may be qualitatively distinguished from the system of industrial capitalism which has characterized North America and western Europe for most of this century. Whether one uses terms like "postindustrialism", "postmaterialism" or "postmodernism", debates have centered on the question of fundamental alterations in the economic, cultural and political organisation of technologically advanced societies. Are we witnessing the creation of an "information economy", are we observing the emergence of a new "knowledge class", which rules by virtue of its educational skills and credentials, is there a new underclass being excluded from paid employment of any form, and is government being privatized to facilitate new forms of global economic integration? Are new types of social movements arising in response to basic changes in our society? This class will address the above questions, with particular emphasis being devoted to discuss issues in contemporary political economy.

FORMAT: Lecture

PREREQUISITE: SOSA 1000.06, 1050.06, 1100.06, or 1200.06

EXCLUSION: SOSA 2140.03, SOSA 2141.03

SOSA 3006.03: Comparative Perspectives on Gender and Work.

This seminar will use comparative perspectives to explore a range of topics relating to the gendering of work: wage-work, household-based labour, the informal sector, masculinity and femininity in the work place, occupational segregation, employment policies directed at changing the status quo (such as affirmative action, pay equity), and unionization. The context will be the changing global political economy and its consequences for the strategies of different groups (such as nation states, but also trade unions, feminist groups and employer groups).

FORMAT: Lecture

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

EXCLUSION: SOSA 2140.03, SOSA 2141.03

CROSS-LISTING: WOST 3006.03

SOSA 3008.03: Canadian Society and Politics.

This class about the nature of Canadian society has as its focus the study of structures and events which shape social and political organization in Canada. There is not only one way to understand Canadian society: generations of historians, political scientists and economists have provided valuable insights as to why Canadians have believed or acted or voted in one way or another. Sociology has helped to understand Canada in terms of contexts and conditions of life which have shaped the evolution of society as we know it. The class explores issues, events, discontents and groups which have produced the recurrent themes that underlie social life in Canada. Approved with Canadian Studies.

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

EXCLUSION: SOSA 2110.06

SOSA 3009.03: Public Opinion.

This class will introduce students to the study of public opinion and impact on informed decision making. In particular, the focus will be upon ideas and issues which have been held by groups and been influenced by the media. The lectures would explore the basis of our knowledge about the formation and change of public opinion relative to other forms of collective behaviour. We will present and analyse data relating to the role of public opinion in explaining and predicting political events.

FORMAT: Lecture 2-3 hours

PREREQUISITE: SOSA 1000.06, 1100.06, 1050.06 and 1200.06

SOSA 3013.03: Religion in Contemporary Society.

Religion is alive and well in society today; some religious organizations are in decline but others appear to be flourishing. How can these tendencies be accounted for? Do we live in a secular age or is that just a flip expression? What does religion mean to people in contemporary society? Is there a search going on for spiritual growth, spiritual awareness, spiritual expression? If so, what forms does this search take? What can we learn by thinking about religion sociologically? What are the trends in religion telling us about the character of late twentieth century society?

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

SOSA 3014.03: Rethinking Culture and Class.

Critical cultural studies has become a vigorous focus of interdisciplinary scholarship drawing on the fields of history, anthropology, sociology, geography, and literary criticism. Researchers in all of these areas are reconsidering the significance of symbolic aspects of social life and how the collective experiencing of cultural forms is related to changes in capitalism and modernity. For example, what is the significance of popular music in different class, gender, and ethnic contexts? How do commitments to kin and community relate to expressions of culture and class consciousness? Are boundaries between work and leisure mutable in terms of class, gender and ethnic processes?

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

SOSA 3031.03: 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: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

EXCLUSION: SOSA 3030.06

SOSA 3060.03: 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 the 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. Approved with International Development Studies.

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06; or IDS 2000.06

CROSS-LISTING: SOSA 5306.03

SOSA 3071.03: Human Nature and Anthropology/Sociology.

Do social anthropology and sociology suffer from "biophobia"? Can evolutionists explain why we feel sexual jealousy or why we tend to follow a dominant leader in times of stress? Can the theories that explain why we have finger prints and flat nails account for why we are cultural animals? This class reviews theory and data on the evolution of human mind and culture in order to construct a theory of human nature and to argue that ethnographers vastly exaggerate the extent to which human societies differ from one another. Its perspective and contents include much of what some have categorized as "Human Sociobiology", "Biosociology", "Darwinian Anthropology", "Darwinian Psychology", and "Darwinian Medicine".

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06; or an introductory class in either Psychology or Biology

EXCLUSION: SOSA 3070.06

SOSA 3081.03: Sociolinguistics.

This seminar considers the relation of language and culture in both western and non-western societies. Topics covered may vary from year to year but usually include: the origin of language, language acquisition, class differences in spoken language, bilingualism, diglossia, dialects, language and world view, linguistic relativism, and language change.

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

EXCLUSION: SOSA 3080.06

SOSA 3100.03: 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; work, domestic labour and sexuality debates; sexism, racism, class; rethinking kinship and reproduction; feminism, culture, and political economy; post-modernism, voice, difference; beyond colonialism and imperialism; beyond women as victims; resistance; and feminist research and praxis.

FORMAT: Lecture 2-3 hours

PREREQUISITE: SOSA 2190.06/WOST 2800.06, or permission of the instructor.

CROSS-LISTING: SOSA 5100.03, WOST 3805.03

SOSA 3120.03: Social Conflict.

This class 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 Marxian 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: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

SOSA 3135.03: 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: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

CROSS-LISTING: SOSA 5135.03

SOSA 3141.03: 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.

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

EXCLUSION: SOSA 3140.06

SOSA 3145.03: 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 child care including birth control, menstruation, menopause, reproductive technology, child care 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: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

CROSS-LISTING: WOST 3800.03, SOSA 5145.03

SOSA 3147.03: Social Gerontology.

A general introduction to social gerontology, in which emphasis 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: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

EXCLUSION: SOSA 2060.03

CROSS-LISTING: HLTH 4900.03

SOSA 3150.03: Sociology and Anthropology of the Body.

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: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

SOSA 3185.03: Issues in the Study of Native Peoples of North America.

This seminar is concerned with the historical background of the Native-European situation in North America and with issues arising from this background. Students will research 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 contemporary issues such as land claims, self-determination and government policy, and social conditions of Natives.

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

EXCLUSION: SOSA 3186.06

CROSS-LISTING: SOSA 5185.03

SOSA 3190.03: 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: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

SOSA 3206.03: Ethnicity, Nationalism and Race.

This class looks at the social construction and present relevance of the categories "ethnicity", "nation", and "race". The current prevalence of identity politics and ethnic nationalism suggest the extent to which these categories are both profoundly political and deeply personal. By looking at case studies from Canada and around the world we examine these ideas and their implications. Topics will vary from year to year, but may include Quebec nationalism, multiculturalism, "ethnic" warfare in Rwanda or Bosnia, and race politics. Approved with International Development Studies.

FORMAT: Seminar 2-3 hours

PREREQUISITE: SOSA 1000.06, 1050.06, 1100.06, 1200.06, or permission on instructor

SOSA 3211.03: Continuity and Change in Rural Societies.

The majority of the world's population, even today, lives in rural settings and depends upon primary production as the principal source of livelihood. This does not mean, however, that rural life has remained static and unchanging over the centuries. All rural societies, even those remote from centres of world power, have long been caught up in the world economic system and involved, in particular ways, with capitalist relations of production. This class examines continuity and change in a range of rural contexts across several continents including North America, and encourages students to consider the notion of "development" from alternative perspectives. Approved with International Development Studies.

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06; or INTD 2000.06

EXCLUSION: SOSA 3210.06

CROSS-LISTING: SOSA 5211.03

SOSA 3220.03: Coastal Communities in the North Atlantic.

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. The focus is on North Atlantic communities.

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

CROSS-LISTING: ENVI 5180.03, SOSA 5220.03

SOSA 3231.03: Psychological Anthropology.

The class examines 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. Approved with International Development Studies.

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

EXCLUSION: SOSA 2230.06, 3230.06

SOSA 3245.03: Women and Aging.

As women grow older, the experience of aging is difficult. 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; older women and housing; self-image and sexuality; health and the aging woman; and older women and poverty.

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06; or two classes in Women's Studies

CROSS-LISTING: WOST 3810.03, NURS 4370.03, SOSA 5850.03

SOSA 3275.03: 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: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06 and SOSA 2180.06

CROSS-LISTING: SOSA 5275.03

SOSA 3281.03: 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: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06 and SOSA 2180.06

EXCLUSION: SOSA 3280.06

SOSA 3286.03: Sociology of Criminal Law.

The increasingly expansive and powerful role of criminal law in the maintenance of social order in Canadian society makes it an important topic of study. The law is examined as a social institution, influenced by socio-political forces and used as an instrument of social control and change. Emphasis is placed on the production of "criminal justice" through the criminal courts system by focusing on the role, responsibilities and negotiated interactions of the various actors in the court process (the accused, victims, defence council, crown prosecutor and the judge). In addition to gaining a realistic understanding of the limits and possibilities of criminal law, students will be engaged in recent debates about law reform (gender justice, sentencing controversies, victims and offender rights etc.).

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06 and SOSA 2180.06

EXCLUSION: SOSA 3285.06

SOSA 3295.03: 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: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06 and SOSA 2180.06

CROSS-LISTING: SOSA 5295.03

SOSA 3310.03: Indian Society: Change and Continuity.

The objective of this class is to introduce students to the society and culture of India from an interdisciplinary perspective. India presents a society of enormous complexity and an unbroken living civilization. Approved with International Development Studies.

FORMAT: Lecture and Seminar

PREREQUISITE: Second-year Arts and/or Science class

SOSA 3400.03: History of Anthropological Theory.

This class considers the foundations and development of social anthropology. Major theoretical schools and the work of prominent anthropologists in those schools are considered, including Cultural Evolution, Historical Particularism, Functionalism, Culture and Personality, Structuralism, Symbolism, Cultural Materialism, and the directions in which contemporary sociocultural anthropology point.

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06; and SOSA 2001.06 or 2002.06

EXCLUSION: SOSA 2250.03

SOSA 3401.03: History of Sociological Thought.

Towards the middle of the nineteenth century a novel way of thinking about human existence began to emerge. Primacy was given to the understanding that humans are social beings, their lives and thoughts bounded and patterned by their social environments. This approach formed the basis for a new discipline of analysis eventually named Sociology. This class considers some of the main ideas of the earlier contributors to the new way of thinking: Comte, Marx, Durkheim, Weber, Simmel, Mead, Mannheim and, more recently, Parsons and Schutz. Modern sociology rests largely on the

intellectual legacy of these thinkers. They raise questions and formulate answers to them which remain relevant to the sociological enterprise today.

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06; and SOSA 2001.06 or 2002.06

SOSA 3402.03: Figuring Out Society.

This class provides an introduction to issues of research design, including the relationship of theory to the choice of methodology. Students are exposed to basic tools and procedures which will help them to analyze the numerical tables and graphs they may come across in sociological or anthropological journals. Other relevant issues will be included, such as, whether it is possible to achieve scientific objectivity when studying human behaviour. It is assumed students enrolled in this class possess basic computer skills.

FORMAT: Lecture 2-3 hours, lab as required

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06; and SOSA 2001.06 or 2002.06

EXCLUSION: SOSA 2011.03

SOSA 3403.03: Qualitative and Field Methods.

Research is a craft requiring many skills. This class focuses on skills complementary to those discussed in SOSA 3402.03 (Figuring out Society). Topics may include: theory and the choice of method; applied social science; field work; ethnography; use of interpreters; interviewing; life histories; note taking; analysis of texts; feminist methodologies.

FORMAT: Lecture 2-3 hours, lab as required

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06; and SOSA 2001.06 or 2002.06

SOSA 3405.03: Contemporary Social Theory.

A variety of approaches constitute theory in contemporary sociology. Among them are those called interactionist, ethnomethodological, structuralist, critical, feminist, rational choice, and post-modernist. This class considers the contributions of these approaches to the enterprise of modern sociology. What are the main premises of particular sociological theories? What are their implications for the study and understanding of the social world? What are the issues that evoke debate between different schools of theory?

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06; and SOSA 2001.06 or 2002.06

SOSA 4000.06: Honours Seminar in Social Anthropology.

The seminar provides an opportunity for students to engage in sustained investigative scholarship requiring an independent research initiative, while requiring them to locate their special topic within a broader set of theoretical and methodological debates in the discipline. The first term is devoted to general seminar discussions. The second term is devoted to students' research and writing activities in preparing the required essay for honours' graduation, and class time is used for students to make "in progress" reports and presentations about their chosen topics. There will be no restriction on topic and no assignment of topics by the instructor. This class carries two separate credits, a "class" credit and an "honours" credit (a University requirement for all honours students SOSA 8880.00).

FORMAT: Seminar 2-3 hours

PREREQUISITE: Honours registration in Social Anthropology or permission of the instructor

SOSA 4001.03: Survey Methods.

This class will examine techniques and issues in survey methods. Topics covered will include sampling designs, questionnaire construction, measurement theory, data collection, and pre-tests. As well, this class provides instruction in the organization and presentation of quantitative data, including graphs, charts, and tables using computer software such as SPSS. Depending on the

instructor, practical experience in survey methods is provided through secondary analysis of an existing data set, or through a class project.

FORMAT: Seminar 2-3 hours

PREREQUISITE: SOSA 3402.03 and fourth year Honours or

Advanced Major standing in Sociology or Social Anthropology

EXCLUSION: SOSA 3115.03

CROSS-LISTING: SOSA 5001.03

SOSA 4002.03: Social Statistics.

This class develops statistical approaches to social science data, focusing on correlation/regression analysis. Beyond developing a basic competence in statistical analysis, the class stresses the creative process of constructing solid scholarly arguments using statistical principles, as well as uncovering artifacts which weaken them. In lieu of a term paper, weekly assignments are given using existing social science data which provides students the opportunity to participate in this process. The class includes both lectures, in which the logic of statistical reasoning is presented, and laboratories, in which statistical techniques are applied to social science data using computer software programmes such as SPSS.

FORMAT: Lectures/lab 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06;

and SOSA 3402.03 and 4001.03

EXCLUSION: SOSA 3415.03

CROSS-LISTING: SOSA 5002.03

SOSA 4003.03: Contemporary Perspectives in Ethnography.

Ethnographies and critical writings which grapple with questions of theory and interpretation in a range of contexts - near and far, familiar and strange, local and global - will be examined in this class.

FORMAT: Seminar 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06;

SOSA 2001.06 or 2002.06; and fourth year Honours or Advanced

Major standing in Sociology or Social Anthropology

CROSS-LISTING: SOSA 5003.03

SOSA 4004.03: Issues in Work, Industry and Development.

Consult department for class description.

FORMAT: Seminar 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

and fourth year Honours or Advanced Major standing in

Sociology or Social Anthropology

SOSA 4005.03: Issues in Social Injustice and Social Inequality.

Consult department for class description.

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

and fourth year Honours or Advanced Major standing in

Sociology or Social Anthropology

SOSA 4006.03: Issues in Health and Illness.

Consult department for class description.

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

and fourth year Honours or Advanced Major standing in

Sociology or Social Anthropology

SOSA 4011.03: Issues in Social Theory.

This seminar consists of an intensive examination of one or more selected bodies of theory, and makes links between theory and current trends in research in sociology and/or social anthropology.

FORMAT: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

and fourth year Honours or Advanced Major standing in

Sociology or Social Anthropology

SOSA 4012.03: Special Topics in Sociology and Social Anthropology.

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: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

and fourth year Honours or Advanced Major standing in

Sociology or Social Anthropology

CROSS-LISTING: SOSA 5012.03

SOSA 4013.03: Issues in Sociology and Social Anthropology.

This seminar consists of an intensive examination of selected substantive issue within Sociology and Social 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: Lecture 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06,

and fourth year Honours or Advanced Major standing in

Sociology and Social Anthropology

SOSA 4072.03: Evolutionary Psychology and the Social Sciences.

This seminar explores the implications of evolutionary psychology for the social sciences. The latter have long followed an environmental-determinist ideology that today requires reconciliation with a plethora of research and theory being developed in evolutionary biology, psychology, ethology, archaeology, and behavioural ecology. Specific topics may include but not be limited to biophobia, social/cultural constructivism, evolutionary approaches to feminist theory, evolutionary medicine, racism/ethnocentrism, crime, morality and religion, the nature of culture, and efforts at international development.

INSTRUCTORS:

FORMAT: Seminar 2-3 hours

PREREQUISITE: SOSA 1000.06, 1050.06, 1100.06, or 1200.06; and

SOSA 3071.03; and fourth year Advanced Major or Honours

standing.

CROSS-LISTING: SOSA 5072.03

SOSA 4205.03: Moral Panics as a Social Phenomenon.

If we relied solely on news reports emanating from the mass media, we might well form the impression that every few years a particular form of allegedly immoral and/or unlawful behavior becomes so widespread as to endanger the very foundation of society. Where such socially shared fears and concerns are exaggerated—i.e., all out of proportion to the actual threat when judged from a rational or empirical perspective — social scientists refer to them as “moral panics.” This class will apply sociological analysis to documented case studies of such panics, both past and present. Examples would include public anxiety about communist infiltration of the U.S. government in the 1950s or, more recently, popularized scares over child sexual abuse, satanism, or serial killing. Particular attention will be paid to the social processes that generate, sustain, and erode adherence to such beliefs.

FORMAT: Seminar 2-3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06

and fourth-year-Advanced Major or Honours standing.

SOSA 4500.06: Honours Seminar In Sociology.

The seminar provides an opportunity for students to engage in sustained investigative scholarship requiring an independent research initiative, while requiring them to locate their special topic within a broader set of theoretical and methodological debates in the discipline. The first term is devoted to general seminar discussions. The second term is devoted to students' research and writing activities in preparing the required essay for honours' graduation, and class time is used for students to make “in progress” reports and presentations about their chosen topics. There

will be no restriction on topic and no assignment of topics by the instructor. This class carries two separate credits, a "class" credit and an "honours" credit (a University requirement for all honours students SOSA 8880.00).

FORMAT: Seminar 2-3 hours

PREREQUISITE: Honours registration in Sociology or permission of the instructor

SOSA 4510.03: 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, permission of the instructor and permission of the Undergraduate Coordinator

SOSA 4520.03: 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, permission of the instructor and permission of the Undergraduate Coordinator

Spanish

Location: 1376 LeMarchant Street
Halifax, NS B3H 3P9
Telephone: (902) 494-3679
Fax: (902) 494-1997

Dean

Taylor, G.D., BA, PhD (Penn)

Chair

Jimenes, M. (494-6957)

Undergraduate Advisor

Jimenes, M. (494-6957)

Professors

Kirk, J.M., BA (Sheff), MA (Queen's), PHD (UBC)
Ruiz Salvador, A., BA (Brandeis), AM, PHD (Harvard)

Associate Professors

Holloway, J.E., BA (No Colo), MA (Wyoming), PhD (Duke)

Lecturer

Jimenes, M., BA, MA (Sorbonne), MA (New School)

I. Introduction

After Chinese and English, Spanish is the most widely spoken language in the world. It is the native tongue of well over 330 million people living in 22 countries.

Spanish-speaking nations are making international headlines and students of political science, economics, commerce, sociology, anthropology, literature, history, international development studies 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. Many 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.

A. 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 SPAN 2020.06 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 2½ 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 3100.06: Advanced Grammar (1 credit)
- SPAN 3120.03: Spanish Art (½ credit)
- SPAN 3140.03: Spanish Literature (½ credit)
- SPAN 3160.03: Spanish History (½ credit)
- SPAN 3180.03: Spanish Culture (½ credit)

II. Degree Programmes

A. Bachelor of Arts with Honours in Spanish

Departmental requirements

Students seeking entrance to the Spanish Honours Programme are generally expected to have at least an A- average in Spanish.

- 1000 level: SPAN 1020.06, or equivalent experience

2000 level

- SPAN 2020.06

3000 level

- SPAN 3020.03
- SPAN 3030.03
- One other credit in Spanish at the 3000 level
- Any additional 6 credits at or above the 2000 level

NOTE: Substitutions are acceptable with the advice and consent of the Department.

- Honours Thesis or Examination

B. Bachelor of Arts with Combined Honours in Spanish and Another Subject

Students who seek entrance into a Combined Honours Programme with the major portion in Spanish must generally have an A- average in Spanish. 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.

C. Advanced Major

Departmental requirements

1000 level: SPAN 1020.06, or equivalent experience
2000/3000 level: Six to nine credits at or above the 2000 level, at least 3 of which must be at or above the 3000 level

D. Major in Spanish

Departmental Requirements

1000 level: SPAN 1020.06, or equivalent experience
2000 level: Two credits in Spanish at or above the 2000 level
3000 level: Two credits at or above the 3000 level

Programme should consist of at least four (4) 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.

III. Classes Offered

Classes marked * are not offered every year. Please consult the current timetable to determine if this class is offered.

SPAN 1010.03: Advanced Beginning Spanish.

For students with some slight prior knowledge of Spanish. Students join, at mid-year, classes of SPAN 1020.06 already in progress.

INSTRUCTOR: Staff

FORMAT: Discussion/conversation 3 hours, lab as needed.

PREREQUISITE: Knowledge of Spanish to the equivalent of first half of SPAN 1020.06

EXCLUSION: SPAN 1020.06

SPAN 1020.06: Beginning Spanish.

For students wishing to achieve proficiency in both spoken and written Spanish.

INSTRUCTOR: Staff

FORMAT: Discussion/conversation 3 hours, language lab and computer-assisted language learning techniques as needed

PREREQUISITE: Open to students with no knowledge or only a slight knowledge of Spanish

SPAN 2020.06: Intermediate Spanish.

This class continues the work done in SPAN 1010.03 or SPAN 1020.06. Supplementary reading as necessary.

INSTRUCTOR: Staff

FORMAT: Discussion/conversation 3 hours, language lab as needed

PREREQUISITE: Spanish 1020.06, or equivalent

***SPAN 2069.03: 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/discussion 2 hours, conducted in English.

PREREQUISITE: No prerequisite. Open to students in all departments. No knowledge of Spanish necessary

***SPAN 2070.03: Area Studies on Mexico and Central America.**

Following an examination of the indigenous heritage, and the colonial legacy of the conquistadors, the class deals principally with the contemporary period, examining the Mexican Revolution and its aftermath, the Somoza dynasty, Nicaragua under the Sandinistas, the U.S. role in the region, the human rights situation in Central America, 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/discussion 2 hours, conducted in English

PREREQUISITE: No prerequisites. Open to students in all departments. No knowledge of Spanish necessary

***SPAN 2080.03: 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/discussion 2 hours, conducted in English

PREREQUISITE: No prerequisites. Open to students in all departments. No knowledge of Spanish necessary

***SPAN 2100.03: 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/discussion 2 hours, conducted in Spanish
PREREQUISITE: SPAN 2010.03 or equivalent facility in the Spanish language

***SPAN 2109.03: 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/discussion 2 hours, conducted in English

PREREQUISITE: No prerequisites. Open to students in all departments. No knowledge of Spanish necessary

***SPAN 2110.03: 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/discussion 2 hours, conducted in English

***SPAN 2130.03: 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. Open to students in all departments. No knowledge of Spanish necessary

INSTRUCTOR: J. Kirk

FORMAT: Lecture/discussion 2 hours, conducted in English.

***SPAN 2200.03: La Civilización de Hispanoamérica.**

The aim of this class is to provide a basic understanding of this varied and historic area. The class examines the development of Latin America from pre-Columbian times to the Mexican Revolution. It also, with the study of selected texts, examines the way in which the reality of Latin America has shaped a continental cultural identity.

INSTRUCTOR: Staff

FORMAT: Lecture 2 hours, conducted in Spanish

PREREQUISITE: SPAN 2020.06, or the equivalent, or permission of the instructor

***SPAN 2210.03: The Novel of the Mexican Revolution.**

The Mexican Revolution (1910-1917) is the first people's revolution of the twentieth century. The prerevolutionary 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. Open to students in all departments. No knowledge of Spanish necessary.

INSTRUCTOR: J. Kirk

FORMAT: Lecture/discussion 2 hours, conducted in English

***SPAN 2230.03: Contemporary Latin American Prose.**

This class samples short stories and novels of contemporary prosists 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/discussion 2 hours, conducted in English

PREREQUISITE: No prerequisites. Open to students in all departments except Spanish. No knowledge of Spanish necessary

***SPAN 2240.03: Contemporary Latin American Prose, Part II.**

This class is a continuation of SPAN 2230.03, but may be taken independently of it.

INSTRUCTOR: J. Holloway

FORMAT: Lecture/discussion 2 hours, conducted in English

***SPAN 2500.03: Introduction to Spanish Literature.**

Study of illustrative works.

INSTRUCTOR: A. Ruiz Salvador

FORMAT: Lecture/discussion 2 hours, conducted in Spanish

PREREQUISITE: SPAN 2020.06, or equivalent

***SPAN 2510.03: Introduction to Latin American Literature.**

Study of illustrative works.

INSTRUCTOR: J. Holloway

FORMAT: Lecture/discussion 2 hours, conducted in Spanish.

PREREQUISITE: SPAN 2020.06, or equivalent

***SPAN 3010.03: 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/discussion 3 hours, conducted in Spanish

PREREQUISITE: SPAN 2020.06, or equivalent

SPAN 3020.03: Translation.

Exercises in translation from Spanish to English and from English to Spanish.

INSTRUCTOR: Staff

FORMAT: Lecture/discussion 3 hours

PREREQUISITE: SPAN 2020.06, or equivalent

SPAN 3030.03: Composition.

Training towards accuracy in writing Spanish. Vocabulary-building, free composition.

INSTRUCTOR: Staff

FORMAT: Lecture/discussion 3 hours

PREREQUISITE: SPAN 2020.06, or equivalent

***SPAN 3040.06: 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 a half-hour long radio programme of magazine format to be aired on CKDU weekly. This Spanish programme 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 programme's fixed segments.

INSTRUCTOR: M. Jiménez

FORMAT: Lecture/discussion 1 hour, radio show ½ hour

PREREQUISITE: Any two of SPAN 3010.03, SPAN 3020.03, and SPAN 3030.03, or permission of the instructor

***SPAN 3060.03: Español Avanzado: Puntos Gramaticales Problemáticos.**

This class focuses on those particular points of the Spanish language and usage which continue to be difficult for the non-native speaker; i.e., *por/para, ser/estar, use of the subjunctive, etc.*

INSTRUCTOR: Staff

FORMAT: Lecture 3 hours

PREREQUISITE: SPAN 2020.06, or permission of the instructor

***SPAN 3070.03: 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/discussion 2 hours, conducted in English

PREREQUISITE: No prerequisites. Open to students in all departments. No knowledge of Spanish necessary

***SPAN 3080.03: 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 2020.06 or equivalent facility in Spanish

EXCLUSION: SPAN 2080.03

***SPAN 3215.03: 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 may include *modernismo, creacionismo* 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/discussion 2 hours, conducted in Spanish

PREREQUISITE: SPAN 2020.06, or equivalent

***SPAN 3225.03: 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 Galdós, Leopoldo Alas, and writers of the Generation of '98 such as Baroja, Unamuno, Ortega, Machado and Jiménez.

INSTRUCTOR: A. Ruiz Salvador

FORMAT: Lecture/discussion 2 hours, conducted in Spanish

PREREQUISITE: SPAN 2020.06, or equivalent

***SPAN 3230.03: Literature of the Spanish Civil War.**

A study of representative works.

INSTRUCTOR: A. Ruiz Salvador

FORMAT: Lecture/discussion 2 hours, conducted in Spanish

PREREQUISITE: SPAN 2020.06, or equivalent

SPAN 3301.03/3302.03/3303.03/3304.03/3305.03: The Cuba Programme at the University of Havana.

See class description for INTD 3301.03 / 3302.03 / 3303.03 / 3304.03 / 3305.03 in the International Development Studies section of this calendar.

***SPAN 3500.03: Contemporary Spanish Literature.**

A study of representative works.

INSTRUCTOR: A. Ruiz Salvador

FORMAT: Lecture/discussion 2 hours, conducted in Spanish

PREREQUISITE: SPAN 2020.06, or equivalent

***SPAN 3510.03: Contemporary Spanish American Literature.**

A study of representative works.

INSTRUCTOR: J. Holloway

FORMAT: Lecture/discussion 2 hours, conducted in Spanish

PREREQUISITE: SPAN 2020.06, or equivalent

***SPAN 3800.03: 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

PREREQUISITE: SPAN 2020.06

***SPAN 3810.03: 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-Nilsson, Leonardo Favio, A. Aristarian, M.L. Bemberg, Emilio Fernández, Paul Leduc, Tomas Gutiérrez-Alea, Humberto Solas, and others are previously viewed by the students and discussed in class.

INSTRUCTOR: M. Jiménez

FORMAT: Lecture/discussion 2 hours, conducted in Spanish

PREREQUISITE: SPAN 2020.06

SPAN 3900.03: Tópicos en Estudios Hispánicos Avanzados.

This class offers the student an opportunity to study aspects of hispanic culture not already included in other language offerings or in literature classes more narrowly defined by period, genre, etc. It takes advantage of special research interests of staff or the unique expertise of visiting faculty to provide instruction in Spanish not regularly available here.

INSTRUCTOR: Staff

FORMAT: Lecture 2 hours, conducted in Spanish

PREREQUISITE: SPAN 2020.06, or equivalent, or permission of the instructor.

***SPAN 3910.03: Tópicos en Estudios Hispánicos Avanzados, Part II.**

This class for advanced Spanish students continues study of the nature described in Spanish 3900.03, but is independent of it and may be taken separately from it.

INSTRUCTOR: Staff

FORMAT: Lecture 2 hours, conducted in Spanish

PREREQUISITE: SPAN 2010.03, or equivalent, or permission of the instructor

SPAN 3970.03: Directed Reading in Spanish American Literature

SPAN 3975.03: Directed Hispanic Studies

SPAN 3980.03: Reading class for majors

SPAN 3990.03: Reading class for majors

***SPAN 4040.03: Advanced Style and Syntax**

INSTRUCTOR: Staff

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: SPAN 3020.03, or equivalent

***SPAN 4500.03: Golden Age Theatre**

INSTRUCTOR: Staff

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: SPAN 3020.03, or equivalent

***SPAN 4510.03: Golden Age Poetry and Prose**

INSTRUCTOR: Staff

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: SPAN 3020.03, or equivalent

SPAN 4980.03: Reading class for Honours students

SPAN 4985.03: Independent Advanced Hispanic Studies

SPAN 4990.03: Reading class for Honours students

Statistics

Location: Chase Building
Halifax, NS B3H 3J5
Telephone: (902) 494-2572
Fax: (902) 494-5130

Interim Dean

Ryall, P.J.C., BSc (Dal), MSc (Alta), PhD (Dal)

Chair of the Department

Cupta, R.P.

Director of Division

Hamilton, D.C.

Faculty Advisors

Hamilton, D.C. (Undergraduate, Honours)
Smith, B. (Graduate)

Professors

Field, C.A., MSc, PhD (Northwestern)
Gabor, G., MSc, PhD (Botvos)
Gupta, R.P., MSc (Agra), PhD (Delhi)
Hamilton, D.C., MA, PhD (Queens)

Associate Professors

Smith, B., MSc (Calgary), PhD (Berkeley)
Thompson, K., MSc (Manchester), PhD (Liverpool) - (jointly with Oceanography)

Assistant Professors

Bowen, K., PhD (Calif)

Post-Doctoral Fellow

Ahnudevar, A., PhD (Tor)
Butler, K., PhD (Simon Fraser)
Venkateswarlu, K., PhD (Madras)

Statistical Consultant

Blanchard, W., MSc (UBC)

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.

I. 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. In addition, a Co-op programme is available. Any student interested in such a course of study should consult the Director of Statistics, Department of Mathematics, Statistics and Computing Science.

Students should consult the "Degree Requirements" section of this calendar for specific regulations.

A. 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.

Departmental Requirements

1000 level

- MATH 1000.03/1010.03
- STAT 1060.03*
- CSCI 1100.03/1101.03**

2000 level

- MATH 2001.03
- MATH 2002.03
- MATH 2030.03/2040.03 or 2135.03
- STAT 2060.03
- STAT 2080.03**
- STAT 2050.03**
- Two to 6 other half credits in Statistics at or above the 2000 level but not including classes listed below.

3000 level

- STAT 3340.03
- STAT 3350.03
- STAT 3360.03
- STAT 3380.03
- STAT 3460.03
- MATH 3090.03
- MATH 3080.03 or 3100.03

4000 level

- STAT 4060.06
- STAT 4620.03
- Honours qualifying exam

*The requirement to take STAT 1060.03 may be waived for students entering the programme in their second year.

**Some students may take either CSCI 1100.03/1101.03 and/or STAT 2050.03, STAT 2080.03 in the first year of their degree programme.

It is recommended that students take STAT 2300.03 and CSCI 3111.03/MATH 3170.03 in either the second or third year of their degree programme.

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.

B. 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.

C. Advanced Major in Statistics

Departmental Requirements

1000 level

- MATH 1000.03/1010.03 or 1500.06
- STAT 1060.03*
- CSCI 1100.03/1101.03

2000 level

- MATH 2001.03
- MATH 2002.03
- MATH 2030.03/2040.03 or 2135.03
- STAT 2060.03
- STAT 2080.03
- STAT 2050.03

3000 level

- STAT 3340.03
- STAT 3360.03
- STAT 3380.03 or 3350.03
- STAT 3460.06
- At least one more credit in Statistics at or above the 3000 level

*The requirement to take STAT 1060.03 may be waived for students entering the programme in the second year.

NOTE: Some students may take STAT 2050.03/2080.03, CSCI 1100.03/1101.03 in their 1st year, of their degree programme. It is recommended that students take STAT 2300.03 and MATH 3170.03/CSCI 3111.03 in either the second or third year of their degree programme.

D. Major in Statistics

Departmental Requirements

1000 level

- MATH 1000.03/1010.03
- STAT 1060.03.

2000 level

- MATH 2030.03
- MATH 2040.03
- STAT 2060.03
- STAT 2080.03
- STAT 2050.03

3000 level

- STAT 3340.03
- STAT 3360.03
- STAT 3380.03 or 3350.03
- STAT 3460.03

NOTE: Some students may take STAT 2050.03 and/or STAT 2080.03 in the spring term of their 1st year if they have taken STAT 1060.03 in the fall term. Students are also advised to take MATH 2001.03/2002.03, STAT 2300.03 and CSCI 1100.03/1101.03 in their 2nd or 3rd year.

E. 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, government 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 4½ 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.

F. Honours Co-op In Statistics

Departmental Requirements

Same as for the regular Honours in Statistics as above with the addition of the following:

- Four Co-op Workterms: STAT 8891.00, 8892.00, 8893.00, 8894.00
- Co-op Seminar: SCIE 8700.00

G. Advanced Major Co-op In Statistics

Departmental Requirements

Same as for the regular Advanced Major in Statistics with the addition of the following:

- Four Co-op Workterms: STAT 8891.00, 8892.00, 8893.00, 8894.00

- Co-op Seminar: SCIE 8700.00

More details on the Co-op programme appear under the Co-operative Education in Science entry in this calendar.

II. Classes Offered

Credit may not be obtained twice for the same class even if the numbers have been changed.

SCIE 3000.06: Science Fundamentals.

See class description in Science, Interdisciplinary section of this calendar.

SCIE 8700.00: Co-op Seminar.

This seminar is used to prepare Co-op students for their first work-term experience. It is a prerequisite for the first work-term.

STAT 1060.03: Introductory Statistics for Science and Health Sciences.

This class 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 class 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 class, 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 2050.03, 2060.03, and STAT 2080.03. Credit will not be given for STAT 1060.03 if credit has previously been obtained for STAT 2060.03. FORMAT: Lecture 3 hours, tutorial 1 hour, MLC PREREQUISITE: Nova Scotia Mathematics 442 or equivalent CROSS-LISTING: MATH 1060.03

STAT 2050.03: Exploratory Data Analysis.

This class is designed to introduce the student to exploratory data analysis and graphical techniques making extensive use of statistical software such as 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: STAT 1060.03

STAT 2060.03: 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 STAT 2080.03 and 3360.03

FORMAT: Lecture 3 hours, MLC
PREREQUISITE: MATH 1000.03/1010.03
CROSS-LISTING: MATH 2060.03, ECON 2260.03

STAT 2080.03: Statistical Methods for Data Analysis and Inference.

The usual sequel to STAT 1060.03 or STAT 2060.03. 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 class. Students will design and carry out a simple experiment as part of this class. A natural sequel for this class is STAT 3340.03.

FORMAT: Lecture 3 hours, MLC

PREREQUISITE: STAT 1060.03 or STAT 2060.03

CROSS-LISTING: MATH 2080.03, ECON 2280.03

STAT 2300.03: Introduction to Mathematical Modelling I.

See class description for MATH 2300.03 in the Mathematics section of this calendar.

STAT 2600.03: Theory of Interest.

See class description for MATH 2600.03 in the Mathematics section of this calendar.

STAT 3340.03: 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: STAT 2080.03, MATH 2030.03 and either MATH 1010.03 or STAT 2060.03

CROSS-LISTING: MATH 3340.03

STAT 3350.03: 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: STAT 3340.03 or consent of instructor

CROSS-LISTING: MATH 3350.03

STAT 3360.03: 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 2060.03 and MATH 2001.03

CROSS-LISTING: MATH 3360.03

STAT 3380.03: 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: STAT 2060.03

CROSS-LISTING: MATH 3380.03

STAT 3460.03: 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: Lecture 3 hours

PREREQUISITE: STAT 3360.03

CROSS-LISTING: MATH 3460.03

STAT 4060.06: Advanced Statistical Theory.

This class is intended to provide a solid basis in statistical 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

PREREQUISITE: STAT 3460.03

CROSS-LISTING: MATH 4060.06, STAT 5060.06

STAT 4070.03: Multivariate Distributions.

This class deals with the distribution theory of the observations on more than one variable. Topics covered include: The multivariate normal distribution, the Wishart distribution, Hotelling's T , distributions associated with regression, canonical correlations and discriminant analysis.

FORMAT: Lecture 3 hours

PREREQUISITE: STAT 3460.03

STAT 4090.03: 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 3360.03 and a third year analysis class, instructor's consent

CROSS-LISTING: MATH 4090.03/5090.03, STAT 5090.03

STAT 4100.03: Survival Analysis.

This class 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: STAT 3340.03 and STAT 3460.03, or equivalent

CROSS-LISTING: STAT 5100.03

STAT 4350.03: 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: STAT 3340.03 and MATH 2135.03 or 2040.03

CROSS-LISTING: STAT 5350.03

STAT 4360.03: 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: STAT 3460.03 and 3340.03

CROSS-LISTING: STAT 5360.03

STAT 4370.03: 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 3360.03 or instructor's consent

CROSS-LISTING: STAT 5370.03

STAT 4390.03: Time Series Analysis I.

Time series analysis in both the time and frequency domain is introduced. The class is applied and students are required to develop their own computer programmes 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: STAT 3340.03, 3460.03, or instructor's consent

CROSS-LISTING: OCEA 4210.03/5210.03, STAT 5390.03

STAT 4620.03: 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: STAT 3340.03, 3460.03, or instructor's consent

CROSS-LISTING: STAT 5620.03

STAT 8891.00: Co-op Work-Term I

STAT 8892.00: Co-op Work-Term II

STAT 8893.00: Co-op Work-Term III

STAT 8894.00: Co-op Work-Term IV

Theatre

Location: Dalhousie Arts Centre, Fifth Floor
Halifax, NS B3H 3J5
Telephone: (902) 494-2233
Fax: (902) 494-1499

Dean

Taylor, G.D., BA, PhD (Penn)

Chair

Vacant

Undergraduate Advisor

Gantar, J.

Professors

Andrews, A.R., BA, DipEd, MA (Leeds), PhD (Ill) FRSA
Perina, P., MA, Dip. Scenography (Frague)

Associate Professors

Christopher, P., Dip (NTSC)
Doyle, R.
Overton, D.R., BA, MA (UBC), PhD (Calif)
Sorge, L., BA (King's/Dal), MA (NYU)

Assistant Professor

Gantar, J., BA, MA (Ljubljana), PhD (Tor)
Stackhouse, S., BA (Dal), Dip. (NTSC), Adv. Dip. (CSSD)

Lecturer

Edgett, K.

Special Instructors

Beale, K.
MacLennan, B., BA (Dal)
Porter, D.
Therlault, R., BEd (Laval)
Thomson, I.

I. Introduction

The Dalhousie Theatre Department offers different ways to study the theatre or some aspect of it.

- 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 programme in Costume Studies which combines academic study and research skills with creative design interpretation and applied skills, leading to: a Diploma (2 years), an Advanced 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.

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. Teaching spaces for costume studies are currently located off-campus.

The department is in 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.

II. Degree Programmes

A. BA In Theatre (Theatre Studies) (3 years; 4 years with Honours)

Departmental Requirements

Year 1

- THEA 1000.06
- THEA 1050.06 or 1800.06

B. 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. The Honours programme requires at least nine and not more than eleven theatre credits beyond the 1000 level, including two beyond the 3000 level. At least the equivalent of two full credits must be taken from each of the following three groupings:

History

- THEA 2011.03
- THEA 2012.03
- THEA 2400.06
- THEA 3500.06
- THEA 3900.06
- THEA 4400.06
- THEA 4500.03
- THEA 4501.03
- An additional credit (the "21st credit"), normally met by taking Theatre 0400.00

Theory

- THEA 2300.06
- THEA 2900.06
- THEA 3510.03
- THEA 3511.03
- THEA 4700.06
- THEA 4900.06
- THEA 4910.06
- An additional credit (the "21st credit"), normally met by taking Theatre 0400.00

Performance

- THEA 2001.06
- THEA 2002.03
- THEA 3200.06
- THEA 3600.06
- THEA 4200.06
- THEA 4710.06 or any of the acting classes
- An additional credit (the "21st credit"), normally met by taking Theatre 0400.00

C. BA with a Major in Theatre (3 years)

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, including two beyond the 2000 level. You may also take an advanced major after consultation with the Undergraduate Advisor. At least the equivalent of one full credit must be taken from each of the three groupings listed above.

D. BA in Theatre (Acting) (3 years; 4 years with Honours)

There are two degree programmes in Acting. The BA in Acting (3 years) and the BA Honours Acting (4 years). These programmes share a common curriculum for the first two years. Auditions will be held at the end of the first year for admission into the upper years of study. At the end of the second year students will be advised as to their ability to succeed in the 4 year Honours Programme. Students who elect to complete their degree in 3 years will design a curriculum for their final year under faculty guidance which will include a performance credit.

E. BA with Honours in Theatre (Acting) (4 years)

Year 1

- THEA 1000.06
- THEA 1800.06
- Three classes in other subjects

Year 2

- THEA 2011.03
- THEA 2012.03
- THEA 2800.06/2810.06
- Two classes in other subjects

Year 3

- THEA 3800.06/3810.06/3820.06
- Two classes in other subjects

Year 4

- THEA 4800.06/4810.06/4820.06
- One other advanced elective in Theatre Studies
- One class in another subject

A role in the DTDP may be submitted as a 21st credit.

F. BA in Theatre (Acting) (3 years)

Year 1

- THEA 1000.06
- THEA 1800.06
- Three classes in other subjects

Year 2

- THEA 2011.03
- THEA 2012.03
- THEA 2800.06/2810.06
- Two classes in other subjects

Year 3

- THEA 3100.06
- Two other Theatre electives
- Two classes in other subjects

The main objective of the Acting Programme is to satisfy the needs of those students who have decided to pursue a professional career in the theatre. The programme is progressive in nature, culminating in a company of student actors who perform in the DTDP Season in their third and fourth years. As it is progressive, students move through all four years together and must, in addition to meeting degree requirements, achieve adequate grades in all acting programme classes, 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 pre-professional training and the benefits of a liberal education at a major Canadian University.

G. BA Combined Honours in Music and Theatre

The four year Bachelor of Arts Combined Honours in Music and Theatre combines the principal classes of the Bachelor of Music concentration in Voice with the Bachelor of Arts in Theatre classes in Acting and Improvisation, Dance and Movement. To qualify for Graduation a student must participate in a staged musical presentation, either as a separate ensemble recital or as an integral part of Theatre Productions, and also must submit a comprehensive essay on an aspect of Musical Theatre. Students must audition for both the Music and the Theatre Departments; a maximum of five will be selected for entrance into the programme each year. The graduate of this programme will advance toward a professional career in the performing arts equipped with a solid foundation in academic, vocal, and stage skills.

Year 1

- MUSC 1101.06: Voice I
- MUSC 1201.03: Music Theory I
- MUSC 1202.03: Music Theory II
- MUSC 1270.03: Aural Perception I
- MUSC 1271.03: Keyboard Skills I
- THEA 1000.06: A Survey of Dramatic Literature (Writing Requirement)
- THEA 1800.06: An Introduction to Acting in Performance
- Ensemble: Chamber Choir

Year 2

- MUSC 2101.06: Voice II
- MUSC 2201.03: Music Theory III
- MUSC 2202.03: Music Theory IV
- MUSC 2270.03: Aural Perception II
- MUSC 2271.03: Keyboard Skills II
- THEA 2830.06: An Introduction to Acting, Improvisation, Movement and Dance
- Arts & Social Science Elective: One of 1000-level Life or Physical Science, Social Science or Language Class Requirement
- Ensemble: Opera Workshop

Year 3

- MUSC 3103.06: Voice III
- MUSC 3319.06/THEA 3010.06: The History of Musical Theatre
- THEA 3800.06: Acting
- THEA 3820.06: Movement and Dance
- Arts & Social Science: One of remaining 1000-level Life or Physical Science, Social Science, or Language Class Requirement
- Ensemble: Opera Workshop

Year 4

- MUSC 4101.06: Voice IV
- THEA 4800.06: Acting
- THEA 4820.06: Movement and Dance
- Arts & Social Science: Remaining 1000-level Life or Physical Science, Social Science, or Language Class Requirement
- Arts & Social Science: Full-credit elective above the 1000-level in Music, Theatre, Language or related subject approved by Departments
- Ensemble: Opera Workshop

A comprehensive essay/production has to be completed to satisfy the "21st credit" requirement.

H. 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 specially 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 requirements, and should then plan to follow one of the following programmes:

BA with Honours in Theatre (Scenography & Technical Scenography) (4 years)

Year 1

- THEA 1000.06
- THEA 1050.06
- Three classes in other subjects

Year 2

- THEA 2011.03
- THEA 2012.03
- THEA 2060.06/2070.06
- THEA 2700.06
- One class in another subject

Year 3

- THEA 3060.06/3070.06
- THEA 3710.06
- Two classes in other subjects

Year 4

- THEA 4700.06
- Two other Theatre electives (at least two of these must be at the 4000-level)
- Two classes in other subjects.
- An additional credit (the "21st credit"), normally met by taking U400.00

BA in Theatre (Scenography & Technical Scenography) (3 years)

Year 1

- THEA 1000.06
- THEA 1050.06
- Three classes in other subjects

Year 2

- THEA 2011.03
- THEA 2012.03
- THEA 2060.06/2070.06
- THEA 2700.06
- One class in another subject

Year 3

- THEA 3060.06/3070.06
- One other Theatre elective
- One class in another subject.

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.

I. Combined BA and BEd

Students are no longer being admitted to this programme. For students currently enrolled in the programme, the outline of this programme is approximately as follows:

Year 1

- THEA 1000.06
- THEA 1800.06
- Introductory class in minor area* (1 full credit)
- Two Arts and Social Sciences electives (2 full credits).

Year 2

- THEA 2001.03
- THEA 2002.03
- THEA 2900.06
- Further classes in minor area* (2 full credits)
- Half credit class in educational foundations
- Half credit Arts and Science or other elective.

Year 3

- THEA 3200.06
- THEA 2011.03
- THEA 2012.03
- Further classes in minor area* (2 full credits at 2000* level)
- Two 0.5 credit classes in educational foundations
- One credit Arts and Science or other elective.

Year 4

- EDUC 4620.06
- One credit class in Field Experience
- One credit in methods area (elementary option: 2 credits)
- One credit in special education
- Half credit class in educational foundations
- Further class in minor area* (1 full credit),
- Half credit Arts and Science or other elective.

*The minor area must also be a recognized teachable subject.

For further information, consult the Undergraduate Advisor.

J. Costume Studies, Diploma in 2 years, Advanced Diploma in 3 years

This programme combines academic study and research skills necessary to the understanding of costume in its broadest context, with the creative interpretation of design and the applied skills of the costumer whose goal is the theatre, film, museums, or historical animation.

Students entering this programme must meet university entrance requirements. Students taking the two-year Diploma take all ten credits in two years. The third year, leading to an Advanced Diploma in Costume Studies, is reserved for students who have a special interest in theatre design, wardrobe management/cutting, film co-ordination/continuity, or museum studies.

Some classes in Costume Studies are open to general BA students.

Please see class listings.

Students taking the two-year Diploma in Costume Studies are required to combine the classes in the following manner:

Year 1

- THEA 1400.03: Designers' Language
- THEA 1405.03: Textile History: An Introductory Survey
- THEA 2400.06: Cave to Cafe: Costume and Identity from Antiquity - 1700
- THEA 2406.06: The Aesthetics of Contemporary Costume
- THEA 2450.06: Costume Technology I
- THEA 3405.06: The Aesthetics of Historical Costume

Year 2

- THEA 3408.03: The Aesthetics of Ritual Costume
- THEA 3450.03: Costume Technology II
- THEA 3454.03: Historical Introduction to Tailoring
- THEA 3455.03: Historical Introduction to Modern Tailoring
- THEA 4400.06: Dress for Success: King's Court to Corporate Office, 1700-1950
- THEA 4450.03: Costume Technology III
- THEA 4451.03: The Fabrication of Textiles
- THEA 4452.03: Costume as Sculpture
- THEA 4454.03: Costume in Performance

Students taking the three-year Advanced Diploma in Costume Studies are required to take the following classes in their third year:

- THEA 4456.06/4457.06/4458.06: Advanced Seminar in Costume Studies
- Elective
- Elective

III. Classes Offered

NOTE: Classes marked * are not offered every year. Please consult the current timetable to determine if these classes are offered.

Classes in the Degree Programme

THEA 1000.06: A Survey of Dramatic Literature.

The purpose of this class is twofold: first, to introduce students to the study of dramatic literature, and to provide them with a knowledge of different styles and genres in various historical periods; and secondly, to instruct students in the methodology of writing in the humanities. Students will be able to address specific problems within their papers and discuss possible questions on an

individual basis in writing tutorials. This class fulfills the writing requirement of Dalhousie University and is a prerequisite for all Theatre Majors.

FORMAT: Writing Requirement, lecture /tutorial 3 hours

***THEA 1010.06: An Introduction to Dramatic Literature (summer session only).**

The purpose of this class is to introduce students to the study of dramatic literature, and to provide them with a knowledge of different styles and genres in various historical periods. It is designed to serve as an elective for the student who wishes to take a single class in theatre. This class may serve as a prerequisite to advanced theatre classes in lieu of THEA 1000.06.

FORMAT: Lecture/discussion 10 hours

THEA 1050.06: Introduction to Theatre Organization and Stagecraft.

This class takes the student behind the scenes to understand how a play is brought to life. Scenography is discussed and explored. Students are introduced to construction, properties, sound, lighting and costume for the stage. How a script is staged determines how an audience will understand the ideas inherent to the script. Methods and procedures for theatre productions make up the substance of this class. This class is a prerequisite for the scenography classes. Students are required to work one show that includes work outside of class time.

FORMAT: Lecture 3 hours

***THEA 1200.06: 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 may be taken as a substitute for THEA 1800.06. 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.

FORMAT: Lecture 6 hours

THEA 1400.03: Designers' Language.

This class explores components of costume design, offering a discourse on design language, colour theory, symbolism, and thematic intent as it relates to theatre, and leads to an understanding of theatrical characterization. This class may be taken by general BA students, and is also part of the Costume Studies Programme.

FORMAT: Lecture/demonstration 3 hours

THEA 1405.03: Textile History: An Introductory Survey.

An introduction to the history of the technology of textiles, through scientific study and exploration, this class provides an opportunity to discover the origins, structure, and characteristics of fibres, through to the woven cloth. Fibres are analyzed from an historical perspective, beginning with the earliest primitive body coverings of man, moving through the natural fibres worn throughout the ages, and ending with the development of man-made fibres in the twentieth century. Through the examination of source material such as artifacts from the eighteenth and nineteenth centuries, the student is enabled to acquire an in-depth knowledge of textiles in their cross-cultural and historical context. This class may be taken by general BA students, and is also part of the Costume Studies Programme.

FORMAT: Lecture/lab 3 hours

THEA 1800.06: An Introduction to Acting and Performance.

This class offers an introduction to a variety of ways to understand performance. Practical exercises coupled with lectures and seminars provide a useful introduction to the communication and facilitation necessary for education students, and anyone interested in the inter-social dynamics of human behaviour. This class is a prerequisite for all acting classes. An auxiliary fee must be paid upon registration in this class.

FORMAT: Lab/seminar 3 hours

***THEA 2001.03: Performance Drama I.**

This class will examine major realistic and non-realistic approaches to performance in the twentieth century. Both theoretical and practical sides of the work will be explored. Consideration will also be given to performance as a factor in social interaction.

FORMAT: Lecture/lab 6 hours

PREREQUISITE: THEA 1000.06

***THEA 2002.03: Performance Drama II.**

This workshop class will explore in greater depth and in practical terms some of the concepts of performance considered in THEA 2001.03. Some public performance is likely.

FORMAT: Lecture/lab 6 hours

PREREQUISITE: THEA 2001.03

THEA 2011.03: 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.

FORMAT: Lecture 3 hours

THEA 2012.03: The History of the Theatre from Renaissance to the Twentieth Century.

This class is in a sense the sequel to Theatre 2011.03, 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.

FORMAT: Lecture 3 hours

***THEA 2020.06: Jazz Dance I (Spring and Summer 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.

FORMAT: Lab/demonstration/lecture 3 hours

THEA 2060.06: Technical Scenography I.

The theory behind the operation of lighting, sound, construction, and properties, as well as the advances in technology and their expense and adaptability, form part of this class. Lecture periods are concerned with stage management, lighting and sound, construction, properties, and other related topics. An auxiliary fee must be paid upon registration in this class.

FORMAT: Lecture/lab 6 hours

PREREQUISITE: THEA 1000.06, 1050.06

CO-REQUISITE: THEA 2070.06

THEA 2070.06: Performance Technology I.

This class is concerned with the more complex problems of the preparation of theatre production in lighting, sound, construction, and properties. Workshop preparation in light and sound, properties, and construction is integrated with crew responsibilities in department productions. This class is the practical application of THEA 2060.06.

FORMAT: Lab 6 hours

PREREQUISITE: THEA 1000.06, THEA 1050.06

CO-REQUISITE: THEA 2060.06

***THEA 2300.06: Film Study.**

The history and development of film, from its beginnings to its social function as a mass entertainment medium. The class examines film genres and history, the component elements of film, and the medium's impact on 20th century society.

FORMAT: Lecture/lab 4 hours

THEA 2400.06: Cave to Cafe: Costume and Identity from Antiquity to 1700.

An introduction to the study of human social behaviour and its relationship to the development of body coverings. This survey class begins with the earliest Mediterranean cultures, Ancient Egypt, Greece and Rome, and continues through to the end of the seventeenth century. This class may be taken by general BA students, and is also part of the Costume Studies Programme.

INSTRUCTOR: Staff

FORMAT: Lecture 2 hours

THEA 2406.06: The Aesthetics of Contemporary Costume.

By examining the aesthetics of contemporary costume, this class will enable the student to understand established systems used to create clothing, utilizing body image as principle means. Through the study and application of systematic principles, the student will gain a better understanding of people's need to define body image in terms of ornamental self-expression and social identification. This class may be taken by general BA students, and is also part of the Costume Studies Programme.

INSTRUCTOR: Staff

FORMAT: Lecture/lab 4½ hours

PREREQUISITE: THEA 1405.03, or permission of instructor.

THEA 2450.06: Costume Technology I.

This class builds upon the knowledge gained in THEA 1405.03, emphasizing sewing skills and techniques, and exploring their multitudines of applications to historical and modern costume. This class is part of the Costume Studies Programme.

FORMAT: Lecture/lab 4.5 hours

PREREQUISITE: See Costume Studies class combinations

RESTRICTION: Costume Studies students only, except by permission of Costume Studies instructors

THEA 2700.06: Scenography I.

Designed to give students basic visual judgment 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 Tjen's *The Elements of Colour*. Students wishing to take this class should consult with the instructor. An auxiliary fee must be paid upon registration in this class.

INSTRUCTOR: Staff

FORMAT: Lecture/lab 6 hours

PREREQUISITE: Permission of instructor

THEA 2800.06/2810.06: Acting I - The Discovery Year.

The second year of the Acting Degree Programme introduces students to the fundamental principles of acting through Acting, Improvisation, Voice and Movement. Emphasis is placed on the discipline that is the basis for a career in the professional theatre.

THEA 2800.06: Acting and Improvisation.

Through the use of theatre games, improvisation, sensory awareness exercises and basic scene work, students will begin to develop their physical, vocal and imaginative abilities. Emphasis will be placed on developing the imagination and accessing a broad range of emotional expression. An auxiliary fee must be paid upon registration in this class.

FORMAT: Lecture/lab 6 hours

CO-REQUISITE: THEA 2810.06

THEA 2810.06: Voice and Movement.

This class will focus on developing vocal and physical spontaneity and expressiveness. Voice: The principles of effective voice use will be identified through kinaesthetic exploration of breath, resonance and articulation, and applied to a variety of text and language environments. Emphasis will be placed on allowing flexible and responsive vocal energy, and on identifying usage patterns that limit the spontaneous connection to the voice. Singing: Musical ability is explored through weekly classes in singing technique. Movement: Students are introduced to fundamental movement and dance technique. Attention is focused on correct alignment, good posture, and healthy body awareness. The students begin a practical exploration into the language of dance. An auxiliary fee must be paid upon registration in this class.

FORMAT: Lab/demonstration/lecture 4 hours

CO-REQUISITE: THEA 2800.06

THEA 2900.06: Dramaturgy.

This class involves specific study of dramaturgical practices introduced in the Survey of Dramatic Literature. Plays are read as performance scripts to gain an understanding of the implicit theatrical and social conventions which they contain, and with an eye to connecting scripts from other societies to a contemporary audience. The relationship between theatres and their communities will be examined and students also work actively with the DTDP season of plays.

FORMAT: Lecture/seminar 3 hours

PREREQUISITE: THEA 1000.06 or permission of instructor

THEA 3010.06: The History of Musical Theatre.

See class description for MUSC 3319.06 in the Music section of this calendar.

***THEA 3020.06: Jazz Dance II. (Spring and Summer 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).

FORMAT: Lab/demonstration/lecture 3 hours

PREREQUISITE: Admission is subject to approval of instructor (Audition/Interview)

THEA 3060.06: Technical Scenography II.

A class designed to supplement Production Technology II. It includes lecture periods devoted to Administration, Publicity, Advance Techniques, and other related topics. This class is a continuation of THEA 2060.06 and covers the topics in greater detail. An auxiliary fee must be paid upon registration in this class.

FORMAT: Lecture/lab 6 hours

PREREQUISITES: THEA 2011.03, 2012.03, 2060.06/2070.06, 2700.06

CO-REQUISITE: THEA 3070.06

THEA 3070.06: Performance Technical II.

An advanced class in production technology. Students work intensively in the areas of: construction, properties, lights and sound, or stage management. Each student serves as crew head for at least two departmental productions.

FORMAT: Lab 6 hours

PREREQUISITES: THEA 2011.03, 2012.03, 2060.06/2070.03, 2700.06

CO-REQUISITE: THEA 3060.06

***THEA 3100.06: Directed Studies in Performance I.**

Under the guidance of the members of faculty the student explores in detail a particular area of performance work. The class may be structured around an earned role (or roles) in a DTDP or in an Independent Student Project (ISP). A suitable advising structure will be designed to suit the particular project. The class content may include specified research documentation and the successful completion of a paper.

FORMAT: Seminar 6 hours

PREREQUISITE: Permission of the Department

***THEA 3200.06: 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 dramaturgies, 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. An auxiliary fee must be paid upon registration in this class.

FORMAT: Lecture/lab 4 hours

PREREQUISITE: THEA 2900.06 or permission of instructor

THEA 3405.06: The Aesthetics of Historical Costume.

A continuation of THEA 2406.06, this class examines the aesthetics of historical costume, tracing the evolution of changing silhouettes and historical pattern-making techniques throughout the eighteenth and nineteenth centuries. The student will learn to appreciate artifacts as historical source material to re-create costumes of the eighteenth and nineteenth centuries. Primary research forms a significant component of this class. This class may be taken by general BA students, and is also part of the Costume Studies Programme.

FORMAT: Lecture/lab 4.5 hours

PREREQUISITE: THEA 2406.06; It is recommended to take this class in conjunction with THEA 4400.06.

THEA 3408.03: The Aesthetics of Ritual Costume.

This class will examine the role played by men's and women's formal attire in theatre and society. The classic suit, military uniforms, and religious dress will be analyzed, compared and contrasted through a variety of historical periods, with a view to gaining a better understanding of people's need to clothe themselves in formally conventional ways. This class may be taken by general BA students, and is also part of the Costume Studies Programme.

FORMAT: Lecture/lab 4½ hours

PREREQUISITE: THEA 1400.03, or permission of instructor

THEA 3450.03: Costume Technology II.

In this year the student will apply the knowledge from THEA 1405.03 and THEA 2450.06 to create modern and historical costumes for the stage. This class is part of the Costume Studies Programme.

FORMAT: Lecture/lab 4½ hours

PREREQUISITE: See Costume Studies class combinations

RESTRICTION: Costume Studies students only, except by permission of Costume Studies instructors

THEA 3454.03: Historical Introduction to Tailoring.

This class introduces the student to the process of tailoring as it originated in the Renaissance, and its development down through the sixteenth, seventeenth, eighteenth, nineteenth, and twentieth centuries. Emphasis is placed on the purpose of underpaddings, understructures and the techniques of fixing them in place. This class is part of the Costume Studies Programme.

RESTRICTION: Costume Studies students only, except by permission of Costume Studies instructors

THEA 3455.03: Historical Introduction to Modern Tailoring.

The "Systems" of Pattern Drafting from the early nineteenth century to the twentieth century. Utilizing traditional tailoring techniques, the process of professional tailored garments is studied in detail.

This class is part of the Costume Studies Programme.

FORMAT: Lecture/lab 4½ hours

PREREQUISITE: See Costume Studies class combinations

RESTRICTION: Costume Studies students only, except by permission of Costume Studies instructors

***THEA 3500.06: 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.

FORMAT: Seminar 2-3 hours

PREREQUISITE: THEA 2011.03, 2012.03, or permission of instructor

***THEA 3510.03: Tragedy.**

A study of how and why the structure of plays has altered from the classical Greek period to the eclecticism of the 20th century. The content of the class will begin with Greek tragedy, cover the Elizabethan/Jacobean periods, the Spanish Golden Age, Neo-Classicism, 19th century Romanticism and modern drama.

FORMAT: Seminar/discussion 3 hours

PREREQUISITE: Permission of instructor

***THEA 3511.03: Comedy.**

This class complements the class on tragedy. The main subject of the class is an in-depth analysis of comedy and other related dramatic genres such as farce, burlesque, parody, travesty and tragicomedy. A substantial portion of class will be devoted to the investigation of classical theories of comedy and laughter.

FORMAT: Seminar/discussion 3 hours

PREREQUISITE: Permission of instructor

***THEA 3600.06: 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 2000.06 and 3200.06 classes. An auxiliary fee must be paid upon registration in this class.

FORMAT: Lecture/lab 4 hours

PREREQUISITE: THEA 2900.06 or permission of the instructor

***THEA 3710.06: Scenography.**

For theatre honours and special scenography students only. It builds on the knowledge from the previous class in the field. THEA 2700.06, as far as visual knowledge is concerned, and from technical knowledge acquired in THEA 2060.06/THEA 2070.06. 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 Willis Wagner's *Modern Woodworking*. An auxiliary fee must be paid upon registration in this class.

FORMAT: Lecture/lab 6 hours

PREREQUISITES: THEA 2011.03, 2012.03, 2060.06/ 2070.06, and 2700.06

THEA 3800.06/THEA 3910.06/THEA 3820.06: Acting II.

The Transformation Year: The third year of the Acting Programme is structured to build on the knowledge acquired in the previous two years of training. Students learn how to implement the freedom they have discovered as they gain further understanding of physical, vocal, and imaginative expression. Third-year students may be invited to perform in the DTDP season, dependent upon the needs of the plays chosen and the student's readiness for the performance situation as assessed by the faculty.

THEA 3800.06: Acting.

This class is designed to build upon the creative and imaginative work done in the first two years of the Acting Class. Students explore personal self-awareness and physical expressiveness through the continued use of relaxation techniques, sensory exercises and 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). An auxiliary fee must be paid upon registration in this class.

FORMAT: Lecture/lab 6 hours

PREREQUISITE: Permission of the department

CO-REQUISITES: THEA 3810.06, THEA 3820.06

THEA 3810.06: Voice and Speech.

Continued exploration of spontaneous voice connection through breath, resonance and articulation, while extending awareness of flexibility, range and power. Inhibiting usage patterns will be further identified and reduced as effective voice-use strategies become more habitual. A variety of texts will be investigated and emphasis placed on developing sensitivity to the stimulus of thought, image, emotion, sensation, and impulse which is embodied in language. A thorough investigation of the component sounds of spoken English will be undertaken, and an ability to utilize Canadian Stage Standard Speech developed. Singing: Musical ability is explored through weekly classes in singing technique. An auxiliary fee must be paid upon registration in this class.

FORMAT: Lecture/lab 6 hours

CO-REQUISITES: THEA 3800.06, 3820.06

THEA 3820.06: Movement/Dance.

The class is designed to develop and enhance the student's movement knowledge. The student will learn a basic warm-up routine which includes exercises for focus, flexibility, alignment and balance. An auxiliary fee must be paid upon registration in this class.

FORMAT: Lab/demonstration/lecture 3 hours

CO-REQUISITES: THEA 3800.06, 3810.06

***THEA 3900.06: Heroines and Actresses: Women In Drama and Theatre.**

This class is intended to provide an 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.

FORMAT: Seminar 2 hours

PREREQUISITE: Some background in dramatic literature and/or theatre studies is useful

CROSS-LISTING: WOST 3900.06

THEA 3910.03: Women in Theatre: an Introduction.

This short seminar class will study some of the circumstances affecting women in the theatre, and is designed to serve as an introduction to the topic. Students will be expected to view the issues that arise in a historical perspective, as well as to examine theatrical practice in the light of more recent theoretical perspectives.

FORMAT: Seminar

PREREQUISITE: Background in Dramatic Literature or Theatre Studies

CROSS-LISTING: WOST 3910.03

THEA 4100.06: Directed Studies in Performance II.

Under the guidance of the members of faculty the student explores in detail a particular area of performance work such as technical scenography, lighting design, stage management, dramaturgy, etc. The class may be structured around an earned role (or roles) in a Dalhousie Theatre Department Production. The class content may include specified research documentation and the successful completion of a paper. An auxiliary fee must be paid upon registration in this class.

FORMAT: Seminar 6 hours

PREREQUISITE: Permission of the Department

***THEA 4200.06: 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.

FORMAT: Seminar 3 hours

PREREQUISITE: THEA 2000.03, 2001.03

THEA 4400.06: Dress for Success: King's Court to Corporate Office, 1700-1950.

This is a survey class which will trace the development of dress through the eighteenth, nineteenth, and first half of the twentieth centuries, showing its evolution from the period when the fashion aesthetic was determined by the courts, to the time of the rise of the common man as the arbiter of taste. Throughout this class, emphasis will be placed on dress worn in England and France, but costume from other countries may be explored as individual topics of research. Emphasis will be placed on the social and cultural aspects of costume history, using slides of representative works of art, films and artifacts as visual documentation for each period. This class may be taken by general BA students, and is also part of the Costume Studies Programme.

FORMAT: Lecture 2 hours

THEA 4450.03: Costume Technology III.

This class extends the expertise in costume creation developed in THEA 1405.03, THEA 2450.06, and THEA 3450.03 to examine techniques of fine finish as students prepare their costume "masterpiece". This class is part of the Costume Studies Programme.

FORMAT: Lecture/lab 4½ hours

PREREQUISITE: See Costume Studies class combinations

RESTRICTION: Costume Studies students only, except by permission of Costume Studies instructors

THEA 4451.03: The Fabrication of Textiles.

The analysis and creative exploration of textiles. Techniques of surface decoration are studied in preparation for original interpretation of Costume Design. Textile manipulation techniques of painting, quilting, beading and various theatrical applications of these techniques will be studied. This class is part of the Costume Studies Programme.

FORMAT: Lecture 2½ hours, lab 2 hours

PREREQUISITE: See Costume Studies class combinations

RESTRICTION: Costume Studies students only, except by permission of Costume Studies instructors

THEA 4452.03: Costume as Sculpture.

Based less in abstract principles and more in creativity, this class examines sculptural forms in a human context to facilitate modern and historical costume design. The student works directly on the human body or mannequin to gain proficiency in modelling textiles to shape costume. This class is part of the Costume Studies Programme.

FORMAT: Lecture/demonstration/lab 4½ hours

PREREQUISITE: See Costume Studies class combinations

RESTRICTION: Costume Studies students only, except by permission of Costume Studies instructors

THEA 4454.03: Costume in Performance.

In this class students will demonstrate their fluency in costume creation with design interpretations for theatrical production. Students will examine problems related to costume as an expression and extension of theatrical character development. The Theatre Department plays provide a venue for students to develop interpersonal and technical skills. Students work as an integral part of a team whose work will ultimately lead to "Opening Night". This class is part of the Costume Studies Programme.

FORMAT: Lecture/lab 4½ hours

PREREQUISITE: See Costume Studies class combinations

RESTRICTION: Costume Studies students only, except by permission of Costume Studies instructors.

***THEA 4456.06/4457.06/4458.06: Advanced Seminar in Costume Studies.**

Students showing an interest in and proficiency for theatre design, wardrobe management/cutting, film co-ordination/continuity, or museum studies may apply to take these classes as independent study. Using an integrative approach by applying the research, analytical, interpretive and creative skills learned in previous Costume Studies classes, students will explore costume in areas of special interest in theatre, film and museum studies, with the guidance of members of the faculty. Students will spend the second semester in a work-study programme. These classes are part of the Costume Studies Programme.

FORMAT: Seminar 9 hours

PREREQUISITE: Permission of Costume Studies Faculty

RESTRICTION: Costume Studies students only, except by permission of Costume Studies instructors

THEA 4500.03: Canadian Drama.

A survey of the Canadian dramatic voice from its origins to the present as it has been shaped by the political, geographical and cultural milieu. The influence of major cultural developments on playwriting in Canada will be examined and specific playwrights will be studied in detail. Approved with Canadian Studies.

FORMAT: Seminar/discussion 3 hours

PREREQUISITE: Permission of instructor

***THEA 4501.03: The History of Canadian Theatre.**

A seminar class exploring the major developments in the history of Canadian theatre from its origin in aboriginal tradition, the major influences of British and American practices, through its post-war revival to the current fringe phenomenon. Approved with Canadian Studies.

FORMAT: Seminar/discussion 3 hours

PREREQUISITE: THEA 2011.03, 2012.03, or permission of instructor

***THEA 4700.06: 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.

FORMAT: Seminar 6 hours

PREREQUISITE: Permission of the department

***THEA 4710.06: Directing in Practice.**

Students gain practical insight into the work of the contemporary theatre director by serving as apprentice assistant directors on two productions of the DTDP season of plays. Enrolment is by special application and limited to two. An auxiliary fee must be paid upon registration in this class.

FORMAT: Discussion/lab 6 hours

PREREQUISITE: Permission of the Department

THEA 4800.06/THEA 4810.06/THEA 4820.06: Acting III.

The Interpretation and Performance Year: Having discovered and strengthened natural abilities students can now apply techniques to scripts of different styles. The students learn to communicate with an audience. This is achieved by applying the in-class work to the DTDP season. Students are expected to earn significant roles in Dalhousie Theatre Department productions.

THEA 4800.06: Acting.

The fourth-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 third 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 DTDP 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) An auxiliary fee must be paid upon registration in this class.

FORMAT: Lecture/lab 15 hours per week, rehearsals week-nights and Saturdays

CO-REQUISITE: THEA 4810.06 or 4820.06

THEA 4810.06: Voice and Speech.

The class will further develop the principles of effective voice use in work on on-stage roles. Class work will focus on continuing to develop an awareness of effective voice use and extending flexibility, range and power. Further investigation of the role of language in theatre performance will enhance the actor's sensitivity to text and to the elements of speech. A practical study of the dialects and accents of spoken English may be applied to roles either as part of the DTDP season or in a workshop situation. An auxiliary fee must be paid upon registration in this class.

FORMAT: Lecture/lab 6 hours

CO-REQUISITE: THEA 4800.06 or 4820.06

THEA 4820.06: Movement/Dance.

The class is designed to further develop and enhance the student's knowledge of movement, incorporating performance, style, and a professional attitude. Emphasis will focus on an expanded practical vocabulary and movement repertoire. An auxiliary fee must be paid upon registration in this class.

FORMAT: Lab/demonstration/lecture 3 hours

CO-REQUISITE: THEA 4800.06 or 4810.06

***THEA 4900.06: Theory and Criticism of Drama and Theatre.**

A writing intensive class that tackles the problems of evaluating 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.

FORMAT: Seminar 2 hours

PREREQUISITE: THEA 2011.03, 2012.03, 2900.06

***THEA 4910.06: Theatre Criticism from Aristotle to the Present.**

A workshop oriented class in which students learn the principles of performance reviewing and theatre criticism using the examples of current productions and classical authors. The discussed critics include: Aristotle, Horace, Boileau, Lessing, Archer, Esslin, Tynan, Simon etc.

FORMAT: Seminar 3 hours

PREREQUISITE: Permission of the Instructor

THEA 0400.00: Production Research Seminar.

A departmental, non-credit class for honours students which fulfils the function of their twenty-first credit. This class is intended to give senior acting, technical scenography and theatre studies students an opportunity to develop their research abilities with respect to a variety of topics related to the plays in the DTDP season, and enable them to provide a theoretical and historical background for each of the productions. Relevant subjects may include text analysis, theatre history, dramatic criticism and theatrical theory, as well as some other disciplines pertinent to a particular play, such as philosophy, music and art history, science, etc.

The class-work should result in extensive programme notes and creation of a world-wide web site for each of the productions. Normally, only fourth-year students admitted into the Honours programme in theatre may take this class.

INSTRUCTOR: A. Andrews

FORMAT: Seminar 1 hour

PREREQUISITE: Acceptance into final year of Honours programme

Women's Studies

Location: Multidisciplinary Centre, Second Floor
1461 Seymour Street
Halifax, NS B3H 3J5
Telephone: (902) 494-2980
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Dean

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Support Staff

Arnold, L.

Faculty

Andrews, A. (Theatre)
Bankier, J. (Law)
Bednarski, B. (French/Canadian Studies)
Binkley, M. (Sociology & Social Anthropology)
Campbell, S. (Philosophy)
Carbert, L., (Political Science)
Cassin, M. (Public Administration)
Crowley, J. (History)
Edwards, E. (Contemporary Studies)
Fingard, J. (History)
Gardiner Barber, J.P. (Sociology & Social Anthropology)
Gilroy, J. (Social Work)
Ginn, D. (Law)
Glowacka, D. (Contemporary Studies, King's College)
Jarman, J. (Sociology & Social Anthropology)
Keddy, B. (Nursing/Sociology & Social Anthropology)
Laidlaw, T. (Undergraduate Medical Education)
Luckyj, C. (English)
MacDonald, M. (Maritime School of Social Work)
Maitzen, R. (English)
Neal, R. (Social Work)
Core, I. (French)
Parpart, J. (History/International Development Studies)
Richard, B. (Social Work)
Sherwin, S. (Philosophy)
Stone, M. (English)
Thompson, J. (English)
Tillotson, S. (History)
Treves, N. (French)
Van Roosmalen, E. (Sociology & Social Anthropology)

I. Introduction

Women's Studies is a dynamic and rapidly expanding interdisciplinary area of study. An alternative to the traditional curriculum, Women's Studies provides students with the opportunity to examine history, social structures, the sciences, language, literature and culture from new and illuminating perspectives. During the last twenty years Women's Studies programmes have been introduced in leading universities across North America. In Canada more than a dozen undergraduate programmes and several graduate programmes have been established since 1970.

At Dalhousie, students can currently enter the following programmes in Women's Studies: a Major, an Advanced Major, or an Advanced Double Major, and a Combined Honours programme. These programmes include classes in the disciplines of English, French, History, Philosophy, Political Science, Sociology and Social Anthropology and Theatre, and in interdisciplinary and professional fields, including International Development, Law, Nursing, and Social Work.

Students in the Dalhousie Women's Studies programmes develop a critical understanding of gender as a category of analysis in scholarly enquiry, social dynamics, cultural expression and belief systems. They also investigate the ways in which gender intersects with other variables such as race, class and cultural difference. They study women's contributions to civilization in many fields of knowledge, and examine the social and ideological forces that have made these contributions "invisible" in the past. Through exposure to a rapidly growing body of research in a number of disciplines and fields, Women's Studies Majors gain a grounding in the methodologies and concepts shaping the organization and dissemination of knowledge.

Women's Studies classes also provide students with opportunities of uniting theory with social and cultural practice, addressing contemporary issues that individuals and institutions are grappling with in the changing world order of the 1990s. They provide a context in which women can find strength and insight through exchanging experiences and ideas with other women, and a context in which women and men together can further human understanding through exploring and respecting differences.

Do men take Women's Studies classes? Yes. At Dalhousie, male faculty members also regularly participate in the teaching of core and related classes in Women's Studies. Gender has operated as a fundamental category in the organization of knowledge, social systems, forms of representation and modes of production and consumption. The critical examination of gender is therefore relevant to men as well as women, in part because it involves the study of constructions of masculinity.

II. Degree Programmes

Women's Studies programmes provide preparation for careers in a variety of fields, as well as for professional schools or graduate programmes. For example, Women's Studies graduates can work as consultants, policy analysts, and officers in government and para-governmental organizations, in business and industry, and in educational institutions. The fields they enter include employment equity, public administration, health care, work place conditions, personnel relations, publishing and editorial work, and public relations.

For students interested in a preparatory degree, Women's Studies programmes provide appropriate preparation for professional schools and programmes in the fields of Education, Social Work, Counselling, Journalism, the Health Professions, and certain areas of Law: Women's Studies programmes also provide suitable preparation for graduate programmes in Interdisciplinary Studies, Cultural Studies, and Educational Studies, as well as in Women's Studies itself. Students interested in proceeding to graduate work should enter a four-year degree programme.

Students normally enter Women's Studies programmes in their second or third year of study. In many cases, students in these years may already have acquired some Women's Studies credits through taking classes in the traditional disciplines or in other interdisciplinary programmes that are cross-listed with Women's Studies core classes.

Students can currently enter four programmes in Women's Studies: a BA Major, a BA Advanced Major, and a BA Advanced Double Major combining Women's Studies with a traditional discipline or with another interdisciplinary programme such as International Development Studies or Canadian Studies; and a Combined Honours programme in Women's Studies and another area of study.

NOTE: The regulations in the "Degree Requirements" section of this calendar apply to students majoring in Women's Studies.

A. BA Major in Women's Studies

3-year, 15-credit programme

This degree is a general liberal arts degree with a concentration in Women's Studies. It permits a wide range of choice in course selection. A three-year degree in Women's Studies can prepare a student for work in the occupational areas described above, or it can be used as a preparatory degree for professional programmes such as Law and Social Work.

Departmental Requirements

- At least four and no more than eight credits beyond the 1000 level in Women's Studies of which two must be beyond the 2000 level
- At least three different disciplines shall be represented in a student's selection of cross-listed Women's Studies classes

B. BA Advanced Major

4-year, 20-credit programme

This programme provides a more comprehensive grounding in Women's Studies than the B.A. Major programme. Students interested in applying to graduate programmes should enter a four-year degree programme.

Departmental Requirements

- At least six and no more than nine credits beyond the 1000 level in Women's Studies of which at least three must be beyond the 2000 level
- At least three different disciplines shall be represented in a student's selection of cross-listed Women's Studies classes

C. BA Advanced Double Major

4-year, 20-credit programme

Students can combine a concentration of Women's Studies classes with classes either in a traditional discipline or with another interdisciplinary programme such as International Development Studies or Canadian Studies.

Departmental Requirements

- At least ten and no more than thirteen credits beyond the 1000 level in two allied subjects, one of which is Women's Studies, with no more than nine and no fewer than four in either
- At least two credits in each of the two subjects chosen shall be beyond the 2000 level
- At least three different disciplines shall be represented in a student's selection of cross-listed Women's Studies classes.

D. BA Combined Honours

4-year, 20-credit programme

Students can enter a Combined Honours programme in Women's Studies and a range of other subjects including Biology, Classics, Contemporary Studies, English, French, History, International Development Studies, Philosophy, Political Science, Psychology, Sociology, Social Anthropology, and Theatre. Students interested in any of these combinations or any other that involves Women's Studies and another subject should consult with the Departments concerned.

General Degree Requirements

Please read the detailed description of Combined Honours Programme in the Degree Requirements section of this calendar (page 13). After meeting the first year requirements, students have two options from which to choose. The First Option, a maximum of seven (7) full credits in the major subject with a minimum of four (4) full credits in the allied subject. In addition, four (4) full elective credits which are not from the major or allied subject group. The Second Option, with departmental approval, a maximum of nine (9) full credits in the major subject with a minimum of four (4) full credits in the allied subject. This particular option can be broken down further into a combination of eight (8) full credits in the major

subject and five (5) full credits in the allied subject or seven (7) full credits in the major subject and six (6) full credits in the allied subject. In addition, two full elective credits which are not from the major or allied subject group.

PLEASE NOTE: Where a class selected from the Women's Studies "list" in the Combined Honours programme is cross-listed with a class in the allied subject, the class may not be double counted (i.e., it may be counted on one or other list, but not on both), where a class selected for the Women's Studies "list" in the Combined Honours programme is cross-listed with a class in the allied subject, this should not result in a student exceeding the maximum allowed in either of the allied subjects.

Departmental Requirements

In addition to meeting the Degree Requirements set out by the Faculty, Women's Studies students must meet the following requirements:

1. At least three Women's Studies classes must be taken beyond the 2000 level
2. At least three different disciplines must be represented in a student's selection of Women's Studies classes (in disciplines other than the allied subject)
3. The following classes are required:
 - (a) At least one full credit from the following: WOST 2300.03, 2301.03, 2500.03, 2800.06 (normally this requirement should be met in the second year of the programme).
 - (b) At least one half-credit from the following: WOST 3050.03, 3500.03, 3600.03, 3650.03, 3805.03
 - (c) At least one full credit 4000 level Women's Studies class, either Directed Readings, Special Topics, or cross-listed class (normally this requirement should be met in the fourth year of the programme).
 - (d) To meet the Honours Examination requirement when Women's Studies is the major subject, students will prepare a research paper under the supervision of a Women's Studies faculty member.

III. Classes Offered

NOTE: Some classes may not be offered every year. Please consult the current timetable to determine if these classes are offered. More detailed information can be obtained from the Multidisciplinary Office.

In addition to the classes listed below, appropriate classes in other departments (for example, Special Topics classes on women and/or gender issues) may be taken as Women Studies credits, with the permission of the instructor concerned and the Coordinator. Students may also select Women's Studies classes at Saint Mary's or Mount Saint Vincent Universities, subject to the rules and regulations of the College of Arts and Science at Dalhousie regarding transfer credits and in consultation with the Women's Studies Coordinator.

WOST 1010.03: Introduction to Women's Studies.

This class is an introduction to the interdisciplinary field of Women's Studies. It is aimed at students who have taken no prior university classes in Women's Studies. Students will be encouraged to develop their own understandings of the subject matter and to work in an interdisciplinary, collegial way. There will be a focus on developing both written and oral skills through frequent assignments and regular discussion in large and small groups. Disagreement and debate are expected and encouraged as multiple viewpoints are explored. It is very important that all participants adopt an attitude of mutual respect for the considered views of others and be open to uncertainty in the exploration of ideas and positions.

INSTRUCTOR: S. Sherwin

FORMAT: Lecture/discussion 1 1/2 hours

WOST 2200.06: 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*. Emphasis is given to the connections between psychological theories and literary depictions of human development, and to the ways in which gender, race and class shape social and psychological formation.

INSTRUCTOR: M. Stone

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: ENGL 1000.06 or permission of the instructor

RESTRICTION: Preference is given to majors in Women's Studies and English

CROSS-LISTING: ENGL 2221.06

WOST 2300.03 Aor B: Making Gender: Male and Female from Antiquity to Mary Wollstonecraft.

This class examines the diverse and fascinating ways western cultures have shaped the meanings of gender. The history of women informs us about the once little-known history of femininity. And, as a result, historical changes in definitions of masculinity become visible. The meanings of gender are exposed in this class through topics such as: the origins of myths of western civilization, the Galenic one-sex model of physiology, patristic theology, the cult of courtly love, eighteenth century salons, and the rights of man.

INSTRUCTOR: S.M. Tillotson

FORMAT: Lecture/tutorial 3 hours

CROSS-LISTING: HIST 2614.03

WOST 2301.03: Making Gender: Male and Female from the American Revolution to the present.

This class examines the diverse and fascinating ways western cultures have shaped the meanings of gender. The history of women informs us about the once little-known history of femininity. And, as a result, historical changes in definitions of masculinity become visible. The meanings of gender are explored in this class through topics such as: republican motherhood, respectability, the family wage, the homosexual, imperialism, citizenship, welfare dependency, and infertility.

INSTRUCTOR: S.M. Tillotson

FORMAT: Lecture/tutorial 3 hours

CROSS-LISTING: HIST 2615.03

WOST 2400.06: Tinker, Tailor, Soldier: Work and Occupations in a Changing World.

Work is a fundamental aspect of all human societies and a key aspect to the development of social inequalities, be they based on gender, class, ethnicity, or cultural difference. Work has been seen as a main component of an individual's identity, but what do we mean by work? Against a backdrop of international and historical patterns, this class considers the changing nature of work and occupations. Topics which may be covered include: agrarian societies; home based labour; work patterns in family life; labour migration and citizenship; international divisions of labour; shifts in occupational structures such as shop floors, typing pools, or professions; managerial and union strategies; the relationship between education and employment; and, how occupational status, employment, and unemployment limit or enhance a person's political power.

INSTRUCTOR: J. Jarman

FORMAT: Lecture 3 hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06.

EXCLUSION: SOSA 2160.03

CROSS-LISTING: SOSA 2161.06

WOST 2500.03: 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.

INSTRUCTOR: S. Sherwin, S. Campbell

FORMAT: Lecture/discussion 2-3 hours

CROSS-LISTING: PHIL 2160.03

WOST 2800.06: 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.

INSTRUCTOR: P. Gardiner Barber

FORMAT: Three hours

PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06, 1200.06; or Women's Studies Class

CROSS-LISTING: SOSA 2190.06

WOST 3000.03/3001.03/3002.06: Directed Readings In Women's Studies.

Readings and research in Women's Studies on selected topics. Students may take appropriate classes in other Departments under these numbers, with the permission of the INSTRUCTOR and the Women's Studies Coordinator, or they may construct their own reading list and research project in consultation with an appropriate faculty member, and the Coordinator.

FORMAT: Variable

PREREQUISITES: Variable

WOST 3006.03: Comparative Perspectives on Gender and Work.

This seminar will use comparative perspectives to explore a range of topics relating to the gendering of work: wage-work, household-based labour, the informal sector, masculinity and femininity in the work place, occupational sector, occupational segregation, employment policies directed at changing the status quo (such as affirmative action, pay equity), and unionization. The context will be the changing global political economy and its consequences for the strategies of different groups (such as nation states, but also trade unions, feminist groups and employer groups).

FORMAT: Staff

FORMAT: Lecture

PREREQUISITE: One of SOSA 1000.06, 1100.06 or 1200.06

EXCLUSION: SOSA 2140.03, SOSA 2141.03

CROSS-LISTING: SOSA 3006.03

WOST 3050.03: Contemporary Women Poets.

During the last few decades, an extraordinary number of powerful new women poets have transformed traditional poetic practices and subject matter. Approaching this body of poetry within the context of key theoretical writings generated by "Second Wave" feminism, this class surveys representative works by Canadian and American poets, and explores the ways in which monolithic ideas of "woman" have been challenged by individuals who are positioned differently by race, class, sexual orientation and national identity. It also considers recurrent topics in women's poetry, including mother-daughter relations, love, rape, the politics of food, the female body, and revisionary myth-making.

INSTRUCTOR: M. Stone

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: ENGL 1000.06 or permission of the instructor

CROSS-LISTING: ENGL 3050.03

WOST 3250.03: 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.

INSTRUCTOR: N. Trèves
FORMAT: Lecture/discussion 3 hours
RECOMMENDED: FREN 2201.03 or FREN 2202.03
CROSS-LISTING: FREN 3250.03

WOST 3300.03: 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.

INSTRUCTOR: J. Crowley
FORMAT: Lecture/discussion 2 hours
PREREQUISITE: 2000-level class in Canadian or American History
CROSS-LISTING: HIST 3350.03

WOST 3310.03: Gender and Development in Africa.

This class examines the economic, political and social roles of women and men in Africa from precolonial to modern times. It analyzes the way women and men construct their lives and economic processes and contest and reinforce the definitions of womanhood and manliness in various African societies. The class will examine development and feminist/gender theory in light of recent debates over gender and development issues.

INSTRUCTOR: J. Parpart
FORMAT: Seminar 2 hours
PREREQUISITE: 1000-or 2000-level History, IDS, or Women's Studies class
CROSS-LISTING: HIST 3461.03/5461.03

WOST 3350.03: Postmodern Strategies in Literature by Women.

In the introduction to Anti-aesthetics, Hal Foster proposed the term "postmodernism of resistance" to speak of the kind of postmodernism that moves beyond the dismantling of the tradition and insists on the need to effect a meaningful change in the status quo. The course Postmodern Strategies in Literature by Women investigates how recent literature by women deploys postmodern procedures such as parody of traditional texts, self-reflective disruption of narrative continuity, fragmentation of the totality of a literary work and the blurring of the boundary between fact and fiction. The postmodern canon has provided women authors with the tools to scrutinize the ways in which female subjectivity has been constructed by male-oriented processes of meaning-production. The critique of the employment of the feminine in the texts written by men and the aesthetic subversion of the phallogocentric politics of representation have resulted in a counterpractice of constructing an affirmative female identity, outside the dominant patriarchal framework.

INSTRUCTOR: D. Glowacka
FORMAT: Seminar 2 hours
CROSS-LISTING: CTMP 3350.03

WOST 3500.03: 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.

INSTRUCTOR: S. Sherwin
PREREQUISITE: Two previous classes in Philosophy or Women's Studies
CROSS-LISTING: PHIL 3170.03

WOST 3600.03: 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: L. Carbert
FORMAT: Lecture/discussion 2 hours
CROSS-LISTING: POLI 3427.03

WOST 3650.03: Woman as Citizen.

Does feminism entail the end of male/female gender roles? Or can women be "equal, but different"? If so, how should government respond in terms of public policy? And how might women do politics differently from men? This class examines the historical context of feminist theory, with attention to its impact on conventional approaches to social and political thought.

INSTRUCTOR: L. Calbert
FORMAT: Seminar
PREREQUISITE: POLI 2400.06/2401.06 or instructor's permission
CROSS-LISTING: POLI 3428.03

WOST 3800.03: 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 child care including birth control, menstruation, menopause, reproductive technology, child care 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.

INSTRUCTOR: E. Van Roosmalen
FORMAT: Seminar 2-3 hours
PREREQUISITE: One of SOSA 1000.06, 1050.06, 1100.06 or 1200.06
CROSS-LISTING: SOSA 3145.03/5145.03

WOST 3805.03: 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; work, domestic labour and sexuality debates; sexism, racism, class; rethinking kinship and reproduction; feminism, culture, and political economy; post-modernism, voice, difference; beyond colonialism and imperialism; beyond women as victims; resistance; and feminist research and praxis.

INSTRUCTOR: P. Gardiner Barber
FORMAT: Seminar 2-3 hours
PREREQUISITE: SOSA 2190.06/WOST 2800.06, or permission of the instructor
CROSS-LISTING: SOSA 3100.03/5100.03

WOST 3810.03: 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.

INSTRUCTOR: B. Keddy
FORMAT: Seminar 2-3 hours
PREREQUISITE: SOSA 1000.06, 1050.06, 1100.06, or 1200.06, or 2 credits in Women's Studies
CROSS-LISTING: SOSA 3245.03/5245.03, NURS 4370.03/5850.03

WOST 3850.03: 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.

INSTRUCTOR: J. Gilroy
FORMAT: Lecture/seminar 2.5 hours
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
CROSS-LISTING: SLWK 3230.03

WOST 3855.03: Feminist Counselling.

This class examines feminist counselling theories and approaches, assesses these critically and assists students in the development of feminist frameworks for counselling.

INSTRUCTOR: J. Gilroy

FORMAT: Lecture/seminar 2.5 hours

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

CROSS-LISTING: SLWK 3170.03

WOST 3900.06: 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.

INSTRUCTOR: A. Andrews

FORMAT: Two hours

RECOMMENDED: Some background in dramatic literature and/or theatre studies is useful

CROSS-LISTING: THEA 3900.06

WOST 3910.03: Women in Theatre: an Introduction.

This short seminar class will study some of the circumstances affecting women in the theatre, and is designed to serve as an introduction to the topic. Students will be expected to view the issues that arise in a historical perspective, as well as to examine theatrical practice in the light of more recent theoretical perspectives.

INSTRUCTOR: A. Andrews

FORMAT: Seminar

PREREQUISITE: Background in Dramatic Literature or Theatre Studies

CROSS-LISTING: THEA 3910.03

WOST 4000.03 / WOST 4100.03 / WOST 4200.06: Selected Topics in Women's Studies.

Advanced readings and research in Women's Studies on selected topics. Students may take appropriate classes in other Departments under these numbers, with the permission of the Instructor and the Women's Studies Coordinator, or they may construct their own reading list and research project in consultation with an appropriate faculty member, and the Coordinator.

FORMAT: Variable

PREREQUISITES: Variable

RESTRICTION: Restricted to senior students

WOST 4250.03: Québec Women Writers/Écrivaines québécoises.

This class will explore the condition of women as revealed in texts by Quebec 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, I. Coore

FORMAT: Lecture/discussion 2 hours

RECOMMENDED: FREN 2201.03/2202.03 and at least one third-year literature class, preferably French Canadian

CROSS-LISTING: FREN 4904.03

WOST 4300.03: Introduction to Women and the Law.

The first half of the class focuses on theory and comprises a broad overview of some of the main themes that have been considered in feminist jurisprudence. For example, feminist epistemology and its relationship to legal method, equality, and feminism in legal education will be examined in detail. In addition, considerable

emphasis is placed upon feminism and its integration with race, class, sexual orientation, and disability. In order to provide context for discussion, a legal historical review of feminism, particularly in Canada, is also presented throughout. The second half of the class develops these ideas by examining specific issues of current interest in feminist scholarship and case law such as pornography, violence against women, work place issues, and abortion.

INSTRUCTOR: D. Ginn or J. Bankier

FORMAT: Lecture/discussion 2 hours

PREREQUISITE: Open to all 2nd and 3rd year Law students as well as students eligible to take classes listed as Women's Studies core classes

CROSS-LISTING: LAWS 2152.03

WOST 4320.03: Feminism, Gender and Development.

Feminist scholarship and activism has spawned a number of theoretical explanations for gender inequalities and relations. In the last decade, poststructuralist and postmodernist critiques have influenced feminist theories in important ways. Grand theories of the past have been called into question; universals have been overtaken by particularities and difference(s). Feminists have reacted to these critiques in a number of ways. Some reject it outright, while others call for a synthesis. Scholars and activists concerned with international development have frequently rejected these debates as irrelevant to the practical concerns of development. However, some scholars have responded more favorably to these ideas. The class will explore the various feminist theories, particularly postmodernist influences, and assess their importance for both the theory and practice of development, especially the development of women.

INSTRUCTOR: J. Parpart

FORMAT: Seminar 2 hours

CROSS-LISTING: HIST 4320.03

WOST 4402.03: Recent French Feminist Theory.

This course will concentrate on some of feminism's most challenging voices, those that have emerged from France in this century: Beauvoir, Kristeva, Cixous and Irigaray. The course will attempt to illuminate the intellectual background against which these women write, particularly in the areas of linguistic and anthropological structuralism, and in psychoanalytic theory. The course will be organized in part by the historical evolution of feminist thought, in part by the consideration of central feminist concerns.

INSTRUCTOR: E. Edwards

FORMAT: Lecture/tutorial

EXCLUSION: Former CSP 2030.06

CROSS-LISTING: CTMP 4302.03

WOST 4450.03: Writing Women/Women Writing 1580-1640.

The objective of this class is to explore the context and range of writings by Renaissance Englishwomen in the late sixteenth and early seventeenth centuries. Adopting a multidisciplinary approach, we will examine a range of cultural documents by and about women, from non-fiction prose (witchcraft trials, medical pamphlets, antifeminist tracts and protofeminist defenses) to address the following questions. Why and how did some Renaissance women write, and for what audience? What was the climate in Renaissance England like for women who wanted to write? What models were available to women writers, and how did they modify or transform them for their own purposes? Is women's writing different from men's writing of the same period? What perceptions of gender — and of life — emerge from women's writing? What shapes does Renaissance "feminism" take? Women writers to be studied in depth will include Lady Mary Wroth, Lady Elizabeth Cary, and Aemilia Lanier.

INSTRUCTOR: C. Luckyj

FORMAT: Seminar

PREREQUISITE: English 1000 or permission of the Instructor

CROSS-LISTING: ENGL 4007.03

WOST 4500.003: 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/S. Campbell

FORMAT: Seminar 2 hours

PREREQUISITE: Strong background in philosophy or feminist theory (normally including at least one previous class in feminist philosophy or permission of the instructor).

CROSS-LISTING: PHIL 4500.03/5500.03, WOST 5500.03

IV. 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) 457-6547;

or

Women's Studies, Saint Mary's University (902) 420-5842.

These classes must be taken on a letter of permission (see the Dalhousie Women's Studies Programme Coordinator).

DalTech

As of April 1, 1997, Dalhousie University and the Technical University of Nova Scotia (TUNS) amalgamated. The former TUNS, now known as DalTech, is a constituent college within Dalhousie and comprises three Faculties (Architecture, Engineering and Computer Science). The amalgamated institution is known as Dalhousie University.

DalTech has a unique place in Canadian higher education, and is dedicated to professional education and research in engineering, architecture, planning and computer science. DalTech was originally founded as the Nova Scotia Technical College in 1907 and established itself in a single building on Spring Garden Road. The original faculty of six taught courses in mining, metallurgy, civil, electrical and mechanical engineering. Over the years new departments of agricultural, chemical, food science and industrial engineering were added. The first degrees were conferred in 1910 on nine students.

From a single building, very few faculty or students, and relatively few courses, DalTech has grown to be more than just a complex of buildings. The range of program offerings at the undergraduate and graduate level has broadened significantly since 1907. The original building is now occupied by the Faculty of Architecture, which was established in 1961, and today degrees are offered in environmental design, architecture, and urban and rural planning.

To encourage research activities DalTech supports or is associated with several research institutes and Centres: Centre for Water Resources Studies (CWRS); Canadian Institute of Fisheries Technology (CIFT); Centre for Marine Vessel Design and Research (CMVDR); Vehicle Safety Research (VSRT); Minerals Engineering Centre (MEC); Nova Scotia CAD/CAM Centre; Atlantic Industrial Research Institute (AIRI). The Faculty of Computer Science, established in 1997, maintains close contacts with industry through numerous joint research, co-operative programs, and an Advisory Board with broad industry representation.

With impressive academic and research standing on an international level, faculty and students continue to be attracted to DalTech from local and national regions, as well as from numerous countries around the world. An Alumni Association with an initial membership in 1920 of 33, now has grown to over 12,000 proud members who can be found around the globe.

Faculty of Architecture

Location: 5410 Spring Garden Road
Halifax, NS
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DalTech
Dalhousie University
P.O. Box 1000
Halifax, NS B3J 2X4
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E-mail: Arch.Office@Dal.Ca
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Interim Dean

Emodi, T., BArch (Melbourne), MES (York), MRAIC
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Head, Department of Urban and Rural Planning
Guppy, S., BSc (Nottingham), MSc, PhD (Wales), MArch (Columbia), MRAIC
Telephone: (902) 420-2621

Academic Coordinator, School of Architecture
Parcell, S., BArch (Toronto), MArch (Cranbrook)
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Administrative Assistant

Barnstead, M., BSc (Dal), BEd (MSVU)
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Departmental Secretary - Architecture

Conrad, S., BA, BEd, MEd (SMU)
Telephone: (902) 420-7692

Departmental Secretary - Planning

Leslie, D., BA (MSVU)
Telephone: (902) 420-7570

Co-op Coordinator for Architecture

Costello, P., BEDS, BArch (TUNS), MRAIC
Telephone: (902) 420-7972

Introduction

The Faculty of Architecture includes the School of Architecture and the Department of Urban and Rural Planning. The Faculty's degree programmes are intended primarily for individuals who intend to become professional architects or planners. A student may apply to enter the Faculty of Architecture's BEDS programme after completing two years of university study in any discipline. The Faculty also offers several classes that are open to all students in the university. For a summary of these classes, please see the "Architecture" section in this calendar. For a full description of programmes offered by the Faculty of Architecture, please see the "Architecture" and "Urban and Rural Planning" sections in the Dalhousie Graduate Studies calendar.

Architecture

Location: 5410 Spring Garden Road
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P.O. Box 1000
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E-mail: Arch.Office@Dal.Ca
WWW: www.dal.ca/architecture

Interim Dean

Emodi, T., BArch (Melbourne), MES (York), MRAIC

Professors Emeriti

Biskaps, O., BArch (Tor), MArch (Florida), FRAIC, ARIBA
Jackson, A., DiplArch (Poly London), ARIBA, MRAIC

Professors

Baniassad, E., BArch (Illinois), MA, PhD (Manchester), FRAIC,
FAIA (Hon.)
Emodi, T., BArch (Melbourne), MES (York), MRAIC, Interim Dean
MacKay-Lyons, B., BEDS, BArch (TUNS), MArchUD (UCLA)
McAleer, J.P., AB (Columbia), MFA (Princeton), PhD (London), FSA
Procos, D., BArch (MIT), MArch (Pratt), MRAIC, MCIP
Wanzel, J.G., BArch, MArch (Tor)

Associate Professors

Cavanagh, E., BSc, BArch (McGill)
Kroeker, R., BSc (Manitoba), AADipl
Parcell, S., BArch (Toronto), MArch (Cranbrook)

Assistant Professors

Macy, C., BA(Arch) (Calif. at Berkeley), MArch (MIT)
Mannell, S., BES, BArch (Waterloo)
Parsons, A., BSc (McGill)
Quek, C., DiplEng (Singapore), BSDesign (Clemson), MArch
(Manitoba)

Lecturer

Kelly, P., BSc (Dal), MSc (TUNS)

Adjunct Professors

Hoffman, D., BArch (Cooper Union)
Sampson, B., BArch (Toronto)

Part-Time Faculty

Bonnemaison, S., BSc (Concordia), BArch (Pratt), MSc(Arch) (MIT),
PhD (UBC)
Doehler, J., BA (King's), BEDS, BArch (TUNS)
Savage, N., BA (Alberta), BEDS, MArch (TUNS)

Undergraduate Advisor

Macy, C (420-2620) E-mail: christine.macy@dal.ca

I. Introduction

The School of Architecture, now part of the Faculty of Architecture in the DalTech college of Dalhousie University, was established in 1961 to serve the Atlantic region. While it continues to fulfil its original mandate, the School also contributes nationally and internationally to architecture. Its primary aim is to educate

individuals who intend to become professional architects. The School's professional degree programme includes the two-year Bachelor of Environmental Design Studies and the two-year Master of Architecture (First Professional). Most of the programme is conducted within the School of Architecture by full-time faculty members. It also includes co-op work terms in which students gain practical experience in an architectural office.

Design

The central activity of the professional degree programme is architectural design - the creative study of buildings and cities. In the School's design studios, students examine historical and contemporary buildings in Canada and abroad, and respond through the design of new architectural projects. From the core studies of the undergraduate programme to the elective studies of the graduate programme, students learn to rely on their artistic skill, their knowledge of history and technology, their social and cultural awareness, and their critical imagination. Architecture is a multi-disciplinary profession, with alliances to the fine arts, the humanities and technologies, and many undergraduate disciplines provide an effective entry into architecture. Conversely, architectural studies provide an excellent foundation for careers in a variety of design-related fields.

Facilities

Following this emphasis on architectural design, one-third of the Architecture building is devoted to studio spaces that are open to Architecture students twenty-four hours a day. The building also has several computer labs with a wide array of equipment, as well as a fully-equipped woodworking shop, photographic facilities, and a large exhibition hall. The DalTech Library's Architecture collection is located nearby.

Co-op Work Terms

The School's professional degree programme includes two work terms that provide students with practical experience in building design and responsible professional practice. The School's Co-op Programme has been operating since 1970, and the University's Co-op Office assists students in finding suitable work-term placements. In recent years, Architecture students have been employed in every province and territory in Canada, and approximately one-third have chosen to work abroad - in Antigua, Bahamas, Barbados, Belgium, Bermuda, Botswana, Chile, Czech Republic, Denmark, Dubai, England, France, Germany, Hong Kong, Indonesia, Ireland, Italy, Japan, Laos, Lebanon, Malaysia, Mexico, Netherlands, Norway, Portugal, Singapore, Scotland, Spain, Switzerland, and the United States.

Accreditation

The School's professional degree programme is accredited by the Canadian Architectural Certification Board and the Commonwealth Association of Architects. The entire six-year programme consists of two years of undergraduate study at a recognized university, followed by two years of undergraduate study at the School of Architecture (BEDS) and two years of graduate study at the School of Architecture (MArch [First Prof.]).

Professional Registration

After receiving the professional degree, a graduate may fulfil additional requirements for professional registration, including a period of post-graduate practical experience and the completion of registration examinations. In Canada, these additional requirements are determined by provincial organizations that are empowered to register an individual for professional practice. Reciprocal registration in Canada and the United States is facilitated by the standard Architectural Registration Examination (ARE) that is used now in both countries. An American citizen who graduates from the School's MArch (First Prof.) programme is qualified to become an architectural intern in the United States and to complete the examination for professional registration there. Applicants from other countries are advised to contact their national architectural organization about requirements for professional registration.

II. Classes for Non-Majors

The Faculty of Architecture offers several classes that are open to all students in the university:

- ARCH 1000.06: Introduction to Architecture.
 - ARCH 3101.04: Survey of Western Architecture I.
 - ARCH 3102.04: Survey of Western Architecture II.
- Some classes in the School's ARCH 4000 and ARCH 6000 series, as well as the Department of Urban and Rural Planning's PLAN 6000 series, may be open to students from other faculties and universities, with the permission of the instructor and the Faculty of Architecture. Graduate classes also require approval from the Faculty of Graduate Studies. Please consult the university's academic timetable for available classes. Individuals who are not currently registered at Dalhousie University should refer to the university's regulations in this calendar for details on Special Student status.

III. Undergraduate Degree Programme

Undergraduate students who are interested in pursuing studies in Architecture or Planning may apply to the Bachelor of Environmental Design Studies programme at the end of their second year. This intent may be declared formally when registering for the first or second year in another degree programme at the university; this will enable a student to maintain contact with the Faculty of Architecture through its Undergraduate Advisor.

Bachelor of Environmental Design Studies

BEDS is a two-year, full-time, pre-professional programme for a student who has already completed at least two years of university studies. It consists of five academic terms in residence and a fourteen-week work term. The BEDS degree recognizes a student's successful completion of a minimum of four years of university study, including two at the School of Architecture.

The BEDS programme consists primarily of required classes in Design, Humanities, Technology and Professional Practice. These classes provide a base of academic knowledge and design skill from which a student may proceed to a graduate programme. The BEDS programme leads to the MArch (First Prof.) programme, as well as to the Faculty's other graduate programmes in Environmental Design Studies and Urban and Rural Planning. A BEDS graduate may also choose to continue into another related field in design, environmental studies, management, etc.

IV. Undergraduate Admission Requirements

A. Admission Criteria

Each September, approximately fifty students are admitted into the BEDS programme. The Admissions Committee gives priority to applicants with a combination of academic performance and creative ability. In assessing one's suitability for the Architecture programme, a potential applicant should consider the following:

- Professional programmes are highly focused and require a high degree of motivation. Architecture is no exception. In addition to intellectual ability, a student needs initiative, tenacity, and creative ability. Much of the programme calls for critical judgment in situations where there are no clear-cut solutions.
- Architectural studies require an understanding of individual and social needs, and a knowledge of humanities, fine arts and technology. Well-rounded personal and academic experience is beneficial, as well as experience in drawing, craft, and computer applications.

B. Minimum Academic Requirements

The minimum academic requirements for admission to the programme are:

- Two years in a university degree programme (normally, ten full-year classes), with a minimum 2.5 grade point average;
- A full-year university class in mathematics. Calculus is recommended, but a math-based class in Physics, Economics or Statistics may be acceptable.

Post-Secondary Institutions

The Admissions Committee may grant up to one year of university credit for an applicant who has attended a post-secondary institution that is not considered a university. Two or more years at a college or an institute of technology plus one year of university normally is acceptable as a minimum.

Mature Students

An application will be considered from a Mature Student – an individual who will be at least 25 years old at the time of registration in the BEDS programme and does not meet the minimum academic requirements for admission (two years of university, mathematics class, 2.5 GPA). In the application, a Mature Student should describe related work experience, and any other pursuits and skills that may serve as grounds for admission. A portfolio of creative work and any post-secondary academic transcripts also must be submitted.

C. Documents

A BEDS applicant must submit all of the following documents before the application can be reviewed:

- 1) To be submitted to the Office of the Registrar:
Admissions, Office of the Registrar, Dalhousie University, Halifax, NS B3H 4H6
 - A completed application form;
 - The appropriate application fee (see University Fees in this Calendar);
 - An official academic transcript from all previous post-secondary institutions;
 - Evidence of competency in English for applicants whose native language is not English (see University Admission Requirements in this Calendar).

To confirm receipt of the above items, please contact the Office of the Registrar.

- 2) To be submitted to the Faculty of Architecture:
Admissions, Faculty of Architecture, DalTech, Dalhousie University, 5410 Spring Garden Road (B3J 1E7), P.O. Box 1000, Halifax, NS B3J 2X4
 - A portfolio of work (about 10-15 items) that demonstrates creative ability and/or artistic skill. The portfolio may include free-hand sketches, precision drawings, paintings, furniture, sculpture, craft objects, creative photography, construction projects, etc. Three-dimensional objects and large works should be included as photographs so that the portfolio can be sent safely and easily through the mail. The portfolio need not be large or elaborate; a folder or binder is sufficient. The applicant's name and address should be identified on the portfolio and any separate items.
 - A letter written by the applicant, describing his/her interest in architecture and in the BEDS programme, and giving the Admissions Committee a sense of the applicant as a person: aspirations, interests, reading, travel, recreational activities, etc.
 - Two letters of recommendation, including one from an academic instructor with close personal knowledge of the applicant's academic background.

D. Application Deadline

The deadline for applications from Canada and the United States is June 1, but late applications may be considered up to August 1. An early response will be given to an application arriving by March 1. The deadline for non-North American applications is April 1.

E. Advanced Standing

The Admissions Committee considers each applicant for advanced standing and recommends the level at which he/she is eligible to enter the programme. This decision is based on classes completed that are equivalent to required BEDS classes, the level of achievement in the design portfolio, and the total years of university. To meet professional accreditation standards, the committee cannot offer a level of advanced standing that would permit a student to obtain the professional degree with less than six

full years of university. For the same reason, any subsequent class exemption must be replaced by an elective class if it would reduce the total years of university below the required six-year total.

V. Undergraduate Regulations

For academic regulations that apply to undergraduate students in the School of Architecture (including workload, class changes, withdrawal, transfer credits, extramural classes, part-time studies, duration of undergraduate studies, minimum degree requirements, assessment, incomplete class work, reassessment of a grade, and academic standing), please refer to the "Undergraduate Academic Regulations" in this calendar.

Please note that some undergraduate regulations differ from their graduate counterparts. Following the 1997 amalgamation of Dalhousie University and the Technical University of Nova Scotia, the university's 1998-99 academic regulations have been coordinated.

VI. Undergraduate Classes Offered

A. Professional Degree Programme

The following chart illustrates the distribution of terms throughout the four years of the professional degree programme in the School of Architecture. The first two years are Bachelor of Environmental Design Studies and the final two years are Master of Architecture (First Professional).

	Fall	Winter	Summer
BEDS - Year 1	B1 (academic term)	B2 (academic term)	B3 (academic term)
BEDS - Year 2	B4 (work term)	B5 (academic term)	B6 (academic term)
MArch - Year 1	M1 (academic term)	M2 (work term)	M3 (work term)
MArch - Year 2	M4 (academic term)	M5 (academic term)	

B. Bachelor of Environmental Design Studies

Year 1 - Term B1 (Fall)

- ARCH 3001.06 Design
- ARCH 3004.02 Communication
- ARCH 3101.04 Survey of Western Architecture I
- ARCH 3201.03 Construction and Structures
- ARCH 3204.01 Environment

Year 1 - Term B2 (Winter)

- ARCH 3002.06 Design
- ARCH 3005.02 Communication
- ARCH 3102.04 Survey of Western Architecture II
- ARCH 3202.03 Construction and Structures
- ARCH 3205.01 Environment

Year 1 - Term B3 (Summer)

- ARCH 3003.06 Design
- ARCH 3006.02 Communication
- ARCH 3103.04 History and Theory of Modern Architecture
- ARCH 3203.03 Construction and Structures
- ARCH 3206.01 Environment
- ARCH 3301.01 Professional Practice

Year 2 - Term B4 (Fall)

- ARCH 4301.01 Professional Practice (Co-op Work Term)

Year 2 - Term B5 (Winter)

- ARCH 4001.08 Design
- ARCH 4101.04 History and Theory of Modern Architecture
- ARCH 4201.04 Building Systems Interface
- ARCH 00B5.00 Elective

Year 2 - Term B6 (Summer)

- ARCH 4002.08 Design
- ARCH 4102.04 Architectural Research and Criticism

- ARCH 4202.04 Building Systems Interface
- ARCH 00B6.00 Elective

Undergraduate Electives

A Year 2 student registers for generic elective classes (e.g. ARCH 00B5.00) at the beginning of the academic year, then chooses a specific class at the beginning of the term when it is offered.

- ARCH 4103.02 History and Theory of Housing
- ARCH 4104.02 History and Theory of Urbanization
- ARCH 4105.02 History and Theory of Building
- ARCH 4106.02 History and Theory of Landscape Architecture
- ARCH 4107.02 Architectural History
- ARCH 4108.02 Community Design
- ARCH 4109.02 Studies in Architectural Representation
- ARCH 4203.02 Innovation in the Building Industry
- ARCH 4204.02 Computers in Architecture
- ARCH 4302.02 Directed Studies in Professional Practice
- ARCH 4401.02 Extramural Subject

VII. Undergraduate Class Descriptions

Class Numbers

The first digit of an ARCH class number indicates its level: introductory classes open to all university students (1), Year 1 of BEDS (3), or Year 2 of BEDS (4). The second digit indicates the area of study: Design (0), Humanities (1), Technology (2), Professional Practice (3), or Special Studies (4). Classes in the BEDS programme have various credit-hour extensions (01-08) that indicate the approximate class hours each week and reflect the appropriate proportion of subjects for professional accreditation. Classes marked (*) are not offered every year. Mandatory classes may be interchanged between academic terms, depending on the availability of instructors. Please consult the academic timetable for current listings. Instructors are listed only for classes that may be available to students from outside the Faculty of Architecture.

*ARCH 1000.06: Introduction to Architecture.

An introductory class showing architecture as a bridge between the Arts and Science, and providing an insight into professional studies. In the first term, discussion centres around some components of architectural design; in the second term, architecture in present day life.

INSTRUCTOR: J. Doehler

FORMAT: Lecture/seminar 1 hour, practical 2 hours

ARCH 3001.06: Design.

This class introduces principles of architectural form and design. It focuses on elementary forms - the hut, the room and the pavilion - on the land and in the city. Projects include analyses of historical buildings and exercises in design.

FORMAT: Lecture/studio 6 hours

RESTRICTION: BEDS students

EXCLUSION: ARB1001

ARCH 3002.06: Design.

This class continues ARCH 3001.06. The basic topic is the architecture of the house in the city, and its development throughout history.

FORMAT: Lecture/studio 6 hours

RESTRICTION: BEDS students

EXCLUSION: ARB1002

ARCH 3003.06: Design.

This class continues ARCH 3002.06. In the studio, students examine issues of building type, program and construction through the design of a small public building. In the field, student groups participate in design projects that may include on-site construction.

FORMAT: Lecture/studio 6 hours

RESTRICTION: BEDS students

EXCLUSION: ARB1003

ARCH 3004.02: Communication

This class introduces graphic skills and representational conventions for architectural design. Topics include line drawing, orthographic and axonometric projections, tonal drawing, and design presentation.

FORMAT: Lecture/studio 2 hours

RESTRICTION: BEDS students

EXCLUSION: ARB1010

ARCH 3005.02: Communication.

This class continues ARCH 3004.02. Topics include perspective construction, colour analysis, and the use of interpretive drawings/models to represent building characteristics and present design ideas. Studio work is done manually and with computer applications.

FORMAT: Lecture/studio 2 hours

RESTRICTION: BEDS students

EXCLUSION: ARB1011

ARCH 3006.02: Communication.

This class continues ARCH 3005.02. Topics include the use of computer applications for two-dimensional composition and three-dimensional modeling. The class also considers the integration of computer-aided design into architectural studio work.

FORMAT: Lecture/studio 2 hours

RESTRICTION: BEDS students

EXCLUSION: ARB1012

ARCH 3101.04: Survey of Western Architecture I.

This class surveys the history of western architecture, beginning with the ancient civilizations of Mesopotamia and Egypt and tracing developments through Greece, Rome and Medieval Europe to the beginning of the Romanesque styles in the early eleventh century. The focus is on the evolution, transformation and definition of styles demonstrated by selected major buildings.

INSTRUCTOR: J.P. McAleer

FORMAT: Lecture 3 hours

EXCLUSION: ARB1112

ARCH 3102.04: Survey of Western Architecture II.

This class continues ARCH 3101.04. It begins with the formation of the Romanesque styles and examines the subsequent process of stylistic evolution, revolution and counter-revolution in Europe to the end of the Rococo period in the first half of the eighteenth century.

INSTRUCTOR: J.P. McAleer

FORMAT: Lecture 3 hours

EXCLUSION: ARB1113

ARCH 3103.04: History and Theory of Modern Architecture.

This class introduces major architects and buildings in Europe and North America from the mid-eighteenth century to the mid-twentieth century. It concentrates on recognized buildings representing influential lines of thought, placed in their cultural contexts. To develop skills in research and criticism, students investigate these buildings through primary and secondary sources, including articles, photographs and drawings.

FORMAT: Lecture/seminar 3 hours

RESTRICTION: BEDS students

EXCLUSION: ARB1116

ARCH 3201.03: Construction and Structures.

The class provides an introduction to the construction process, examining the materials, methods and sequences of building construction as embodied in simple frame-built and mass-built buildings. It is taught through lectures and studio exercises, with reference to historic and contemporary built examples, as well as student projects in the design studio.

FORMAT: Lecture/studio 3 hours

RESTRICTION: BEDS students

EXCLUSION: ARB1208

ARCH 3202.03: Construction and Structures.

The class presents the principles of construction and structure as they relate to architecture. Methods of structural analysis are studied, including tools for the modeling and analysis of building structure. Building materials are studied in respect of their structural properties and their constructional implications. Principles of assembly and jointing are presented, and an analytical model for the study of building construction in terms of compound assemblies and the relationship between discrete assemblies is developed.

FORMAT: Lecture/studio 3 hours

RESTRICTION: BEDS students

EXCLUSION: ARB1210

ARCH 3203.03: Construction and Structures.

This class extends the study of structure to include statutory requirements and industry performance standards. More complex structural systems are examined, as well as the interaction of various forces and structural subsystems within a building, and the performance issues related to the selection of structural systems and materials are introduced. The study of building construction is extended to include the performance of materials in assemblies, including the dynamic actions and weathering of building materials. The act of building is examined at the level of the construction detail, including performance of the building envelope.

FORMAT: Lecture/studio 3 hours

RESTRICTION: BEDS students

EXCLUSION: ARB1212

ARCH 3204.01: Environment.

The principles and theories of electrical and light engineering will be used to study light in architecture. Both natural and artificial sources will be studied, quantified and discussed. The class will conclude with an investigation of light-sensitive environments in architecture, such as art galleries.

FORMAT: Lecture 1 hour

RESTRICTION: BEDS students

EXCLUSION: ARB1207

ARCH 3205.01: Environment.

The principles and theories of mechanical engineering will be used to study heat in architecture. Both natural and artificial sources will be studied, quantified and discussed. The class will conclude with an investigation of heat-sensitive environments in architecture, such as laboratories.

FORMAT: Lecture 1 hour

RESTRICTION: BEDS students

EXCLUSION: ARB1209

ARCH 3206.01: Environment.

The principles and theories of acoustics will be used to study sound in architecture. Both natural and artificial sources will be studied, quantified and discussed. The class will conclude with an investigation of sound-sensitive environments in architecture, such as theatres.

FORMAT: Lecture 1 hour

RESTRICTION: BEDS students

EXCLUSION: ARB1211

ARCH 3301.01: Professional Practice.

Topics include the relation between the architect and society; the political, social and economic environments in which architects practice; and an introduction to office organization and project management.

FORMAT: Lecture/seminar 1 hour

RESTRICTION: BEDS students

EXCLUSION: ARB1303

ARCH 4001.08: Design.

This class explores particular facets of architecture. Studio options are offered in topics such as: housing, urban design, adaptive re-use of buildings, process of building, and environmental issues.

FORMAT: Lecture/studio 6 hours

RESTRICTION: Year 2 BEDS students

EXCLUSION: ARB2001

ARCH 4002.08: Design.

This class involves the design of a major public building in an urban situation. The project encourages the integration of previous undergraduate studies in design, humanities and technology.

FORMAT: Lecture/studio 6 hours

RESTRICTION: Year 2 BEDS students

EXCLUSION: ARB2002

ARCH 4101.04: History and Theory of Modern Architecture.

This class is a survey of twentieth-century modern architecture, with a focus on North America. Works are situated in their social and political contexts, and discussed in terms of theoretical constructs that influenced their development.

FORMAT: Lecture/seminar 3 hours

RESTRICTION: Year 2 BEDS students

EXCLUSION: ARB2111

ARCH 4102.04: Architectural Research and Criticism.

This class explores contemporary critical architectural discourse, with a focus on the ethical, social and political dimensions of architecture. Topics vary from year to year, but may include marxism, feminism, ecology, phenomenology and post-structuralist theory.

FORMAT: Lecture/seminar 3 hours

RESTRICTION: Year 2 BEDS students

EXCLUSION: ARB2118

***ARCH 4103.02: History and Theory of Housing.**

This class compares significant historic housing schemes with contemporary examples. It focuses on historic examples such as the Weissenhof Exhibition, Le Corbusier's contribution to housing, Le Corbusier's imitations, and the work of Team X.

INSTRUCTOR: J.G. Wanzel

FORMAT: Lecture/seminar 1.5 hours

RESTRICTION: BEDS students, or permission of instructor

CROSS-LISTING: PLAN 6111.03

EXCLUSION: ARB2106

***ARCH 4104.02: History and Theory of Urbanization.**

This class investigates urban form, theory and "urban experience" in the metropolis from the mid-eighteenth century to the present. Nineteenth- and twentieth-century urban design proposals which identified and proposed solutions to the problems of the industrial city are discussed and analyzed in terms of the social, historical and economic forces that shaped them.

FORMAT: Lecture/seminar 1.5 hours

RESTRICTION: BEDS students, or permission of instructor

CROSS-LISTING: PLAN 6101.03

EXCLUSION: ARB2115

***ARCH 4105.02: History and Theory of Building.**

This class investigates materials and methods of production for buildings from the mid-eighteenth century to the present. Modern architecture is considered in relation to changes in the weight, strength, refinement and workability of building materials, and changes in convention, building assembly, reproduction and engineering theory.

FORMAT: Lecture/seminar 1.5 hours

RESTRICTION: BEDS students, or permission of instructor

EXCLUSION: ARB2117

***ARCH 4106.02: History and Theory of Landscape Architecture.**

This class deals with changing landscapes and perceptions of the natural world during the past 250 years. It discusses the effects of technology and resource use on the design of landscapes as small as a private garden and as large as a bio-region, and examines the changing role of landscape architects, their writings and their collaboration with architects.

INSTRUCTOR: S. Guppy

FORMAT: Lecture/seminar 1.5 hours

RESTRICTION: BEDS students, or permission of instructor

CROSS-LISTING: PLAN 6108.03

EXCLUSION: ARB2108

***ARCH 4107.02: Architectural History.**

This class is a survey of a major period or personality in architectural history prior to the nineteenth century. The development of style will be charted through an examination of the artistic and cultural phenomena that may have shaped it.

INSTRUCTOR: J.P. McAleer

FORMAT: Lecture/seminar 1.5 hours

RESTRICTION: BEDS students, or permission of instructor

EXCLUSION: ARB2113

***ARCH 4108.02: Community Design.**

This class is an overview of the theory and practice of community planning with emphasis on the physical organization of communities. Alternatives to indiscriminate urbanization will be derived from a deeper understanding of the urbanization process. This will involve technical studies of the urban fabric. At the same time, students will further their understanding of the socio-economic context in which community planning operates, through analytic work in paper and seminar form.

FORMAT: Lecture/seminar 1.5 hours

RESTRICTION: BEDS students, or permission of instructor

EXCLUSION: ARB2112

***ARCH 4109.02: Studies in Architectural Representation.**

This class examines critical issues in architectural representation and its history and theory. Topics may include intention, mode of representation, media, and geometry.

FORMAT: Seminar/studio 1.5 hours

RESTRICTION: BEDS students, or permission of instructor

EXCLUSION: ARB2119

ARCH 4201.04: Building Systems Interface.

The class is offered as a vehicle for studying the interfacing of building technologies -- structural, constructional and environmental systems. These studies are directly related on a consultancy basis to work that is on-going in the design studio. They enable the student to appreciate all the technical influences on architectural design and to develop an understanding of buildings as complex systems.

FORMAT: Lecture/studio 3 hours

RESTRICTION: Year 2 BEDS students

EXCLUSION: ARB2201

ARCH 4202.04: Building Systems Interface.

Continuation of ARCH 4201.04.

FORMAT: Lecture/studio 3 hours

RESTRICTION: Year 2 BEDS students

EXCLUSION: ARB2205

***ARCH 4203.02: Innovation In the Building Industry.**

This class studies innovation, the process of bringing invention into use, analyzed into components and made subject to rational control, with innovation in design and production processes the main concern.

FORMAT: Lecture/seminar 1.5 hours

RESTRICTION: BEDS students, or permission of instructor

EXCLUSION: ARB2204

*ARCH 4204.02: Computers in Architecture.

This class focuses on principles of computer-aided architectural design, involving representations of architectural form in 2D and 3D.

FORMAT: Lecture/seminar 1.5 hours

RESTRICTION: BEDS students, or permission of instructor

EXCLUSION: ARB2202

ARCH 4301.01: Professional Practice (Co-op Work Term).

A student works in some aspect of the profession for a total of fourteen weeks, and completes a research report or assignment set by Faculty. Work placements are coordinated by the Co-op Coordinator for Architecture and must be approved by Faculty. A student may apply to satisfy up to fourteen weeks of the time requirement through supervised research related to Professional Practice.

RESTRICTION: Year 2 BEDS students

EXCLUSION: ARB2304

*ARCH 4302.02: Directed Studies in Professional Practice.

This class is a directed study, guided by an architectural practitioner, in architectural research related to her or his practice. The research project may be proposed by the practitioner, or by the student in consultation with the practitioner. The project outline must be approved by the chair of the Professional Practice teaching group. Refer to the publication, "Guidelines for Directed Studies in Professional Practice".

RESTRICTION: BEDS students

EXCLUSION: ARB2305

*ARCH 4401.02/4402.02: Extramural Subject.

A subject of university credit offered by another faculty/university. The subject need not be related directly to a student's architectural studies, and the class may be at any undergraduate or graduate level. To enrol in the class, a student must receive prior approval from the School's Academic Coordinator and from other sources specified in the Undergraduate Academic Regulations. No more than one extramural subject may be taken in any term.

RESTRICTION: BEDS students

EXCLUSION: ARB2400/2405

VIII. Master of Architecture (First Prof.)

The Master of Architecture (First Professional) programme description is included here in the undergraduate calendar to provide an overview of the entire professional degree programme in the School of Architecture, which includes both the BEDS and the MArch (First Prof.) degrees. Please refer to the Graduate Studies calendar for complete regulations for the MArch (First Prof.) programme.

Master of Architecture (First Prof.) is a two-year, full-time programme consisting of three academic terms in residence and a 26-week work term. It includes required classes that complete the core requirements for the School's professional degree programme. Elective classes also enable a student to focus on a particular area of study such as housing, urban design, history and theory, building technology, environmental design, and computer applications. In the final year each student works on a design thesis, supervised by a faculty member.

For information on the School's two other graduate programmes, Master of Architecture (Post-Professional) and Master of Environmental Design Studies, please refer to the School of Architecture section in the Graduate Studies calendar.

IX. MArch (First Prof.) Admission Requirements

A. Minimum Academic Requirements

Candidates for all graduate programmes must meet the minimum admission requirements of the Faculty of Graduate Studies.

Admission is based on the applicant's design portfolio and academic record. A minimum of four years of university is required, including architectural studies equivalent to the Dalhousie BEDS degree with a minimum 3.00 grade point average or B average. In assessing external applicants, the Admissions Committee looks for academic strengths in design, humanities and technology that are equivalent to standards at the end of the BEDS programme.

B. Documents

An applicant to the MArch (First Prof.) programme must submit all of the following documents before the application can be reviewed:

- (1) To be submitted to the Office of the Registrar:
Admissions, Office of the Registrar, Dalhousie University, Halifax, NS, B3H 4H6
 - a completed application form;
 - the appropriate application fee;
 - an official academic transcript from all previous post-secondary institutions;
 - evidence of competency in English for applicants whose native language is not English.

To confirm receipt of the items above, please contact the Office of the Registrar.

- (2) To be submitted to the Faculty of Architecture:
Admissions, Faculty of Architecture, DalTech, Dalhousie University, 5410 Spring Garden Road (B3J 1E7), P.O. Box 1000, Halifax, NS, B3J 2X4
 - a portfolio of design work that demonstrates the applicant's design ability and/or artistic skill. Three-dimensional objects and large works should be included as photographs so that the portfolio can be sent safely and easily through the mail. The portfolio need not be large or elaborate; a folder or binder is sufficient. The applicant's name and address should be identified on the portfolio and any separate items.
 - a letter written by the applicant, describing his/her interest in architecture and in the MArch programme, and giving the Admissions Committee a sense of the applicant as a person: aspirations, interests, travel, etc.
 - two letters of recommendation, including one from an academic instructor with close personal knowledge of the applicant's academic background.

C. Application Deadline

The deadline for applications from Canada and the United States is June 1, but late applications may be considered up to August 1. An early response will be given to an application arriving by March 1. The deadline for non-North American applications is April 1.

D. Advanced Standing

The Admissions Committee considers each applicant for advanced standing and recommends the level at which he/she is eligible to enter the programme. The Committee cannot offer a level of advanced standing that would permit an applicant to obtain the professional degree with less than six full years of university. An applicant who is admitted with advanced standing must complete at least a full class load in Terms M4 and M5 to qualify for the degree. An applicant who is ineligible for MArch (First Prof.) admission may be offered advanced standing in the BEDS programme.

X. Graduate Regulations

Faculty of Graduate Studies regulations can be found in the Graduate Studies calendar. Additional regulations for the MArch (First Prof.) programme are located in the Architecture section of that calendar.

XI. MArch (First Prof.) Classes Offered

Professional Degree Programme

The following chart illustrates the distribution of terms throughout the four years of the professional degree programme in the School of Architecture. The first two years are Bachelor of Environmental Design Studies and the last two years are Master of Architecture (First Professional).

	Fall	Winter	Summer
BEDES - Year 1	B1 (academic term)	B2 (academic term)	B3 (academic term)
BEDES - Year 2	B4 (work term)	B5 (academic term)	B6 (academic term)
MArch - Year 1	M1 (academic term)	M2 (work term)	M3 (work term)
MArch - Year 2	M4 (academic term)	M5 (academic term)	

The class requirements for the MArch (First Professional) programme are as follows:

Year 1 - Term M1 (Fall)

- ARCH 5001.06 Design
- ARCH 5101.04 History and Theory of Cities
- ARCH 5301.01 Professional Practice
- ARCH 00M1.00 Elective

Year 1 - Term M2 (Winter)

- ARCH 5302.01 Professional Practice (Co-op Work Term)

Year 1 - Term M3 (Summer)

- ARCH 5303.01 Professional Practice (Co-op Work Term)

Year 2 - Term M4 (Fall)

- ARCH 9001.16 Thesis
- ARCH 5201.04 Building Systems Interface
- ARCH 5304.01 Professional Practice
- ARCH 00M4.00 Elective

Year 2 - Term M5 (Winter)

- Thesis (cont'd)
- ARCH 00M5.00 Elective

Graduate Electives

A student registers for generic elective classes (e.g., ARCH 00M1.00) at the beginning of the academic year, then chooses a specific class at the beginning of the term when it is offered.

- ARCH 6101.02 Housing Research Seminar
- ARCH 6102.02 Buildings in Perspective
- ARCH 6103.02 Topics in Urban Design
- ARCH 6104.02 Women and the Built Environment
- ARCH 6105.02 Multimedia in Architecture
- ARCH 6106.02 Interdisciplinary Studies for Architecture
- ARCH 6107.02 Advanced Seminar in Humanities
- ARCH 6110.02 Advanced Seminar in Computer Applications
- ARCH 6113.02 Research Studies in Humanities
- ARCH 6116.02 Research Studies in Computer Applications
- ARCH 6201.02 Construction
- ARCH 6202.02 Innovations in Architecture & Building
- ARCH 6203.02 Advanced Seminar in Technology
- ARCH 6206.02 Research Studies in Technology
- ARCH 6301.02 Directed Studies in Professional Practice
- ARCH 6302.02 Advanced Seminar in Professional Practice
- ARCH 6303.02 Research Studies in Professional Practice
- ARCH 6401.02 Personal Project
- ARCH 6404.02 Extramural Subject

XII. Graduate Class Descriptions

Class Numbers

The first digit of an ARCH class number indicates whether it is a required graduate class (5), a graduate elective (6), MArch (Post-Prof.)/MEDS class (7), or Thesis (9). The second digit indicates the area of study: 0 (Design), 1 (Humanities), 2 (Technology), 3 (Professional Practice), 4 (Special Studies). Classes have various credit-hour extensions (01-16) that indicate the approximate class hours each week and are based on the appropriate proportion of subjects for professional accreditation. Not all elective classes (*) may be offered every year. Mandatory classes may be interchanged between academic terms, depending on the availability of instructors. Please consult the academic timetable for current listings. Instructors are listed only for classes that may be available to students from outside the Faculty of Architecture.

ARCH 5001.06: Design.

This class explores contemporary architectural questions through the design of a building of broad urban and cultural significance. Its emphasis on imagination and criticism characterizes self-motivated work in the graduate programme.

FORMAT: Lecture/studio 6 hours

RESTRICTION: Graduate students in the Faculty of Architecture

PREREQUISITE: ARCH 4002.08 or equivalent

EXCLUSION: ARM3001

ARCH 5101.04: History and Theory of Cities.

This class examines selected major cities, their originating form, important buildings, and building types in their history. The aim of the class is to explore the relationship between architecture and urbanism, and the relationship between individual buildings and the city.

FORMAT: Lecture/seminar 3 hours

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

EXCLUSION: ARM3112

ARCH 5201.04: Building Systems Interface.

The objective of the class is to provide the student with a knowledge and understanding of the processes of building as they influence design through building systems: structure, construction, environmental technology and building services. Students learn to evaluate different processes of building as a means of developing the design, and undertake a project relating technology to design, the technological content of which provides a basis for further study in subsequent class work.

FORMAT: Lecture/studio 3 hours

RESTRICTION: Graduate students in the Faculty of Architecture

PREREQUISITE: ARCH 4202.04 or equivalent

EXCLUSION: ARM3201

ARCH 5301.01: Professional Practice.

The class focuses on practice management: contracts, codes, reference documents, finance, costing techniques, and contract administration.

FORMAT: Lecture/seminar 1 hour

RESTRICTION: Graduate students in the Faculty of Architecture

EXCLUSION: ARM3302

ARCH 5302.01/ARCH 5303.01: Professional Practice (Co-op Work Term).

A student works in some aspect of the profession for a total of twenty-eight weeks, and completes a research report or assignment set by Faculty. Work placements are co-ordinated by the Co-op Coordinator for Architecture and must be approved by Faculty. A student may apply to satisfy up to fourteen weeks of the time requirements through supervised research related to Professional Practice.

RESTRICTION: MArch (First Prof.) students

EXCLUSION: ARM3305

ARCH 5304.01: Professional Practice.

Topics include professional ethics, partnerships, corporate practices, professional responsibility, and legal aspects of practice.

FORMAT: Lecture/seminar 1 hour

RESTRICTION: Graduate students in the Faculty of Architecture

PREREQUISITE: ARCH 5301.01

EXCLUSION: ARM4301

***ARCH 6101.02: Housing Research Seminar.**

This seminar explores the interactions of the residential construction industry's constituent parts: real estate, finance, government policy and programmes, development interests, etc. An open-ended inquiry touches on such questions as: housing quality, housing distribution patterns, employment, industrialization, urbanization, rural under-development, foreign ownership, the role of the industry in the Canadian political-economy.

INSTRUCTOR: J.G. Wanzel

FORMAT: Lecture/seminar 1.5 hours

RESTRICTION: Graduate students in the Faculty of Architecture; or permission of instructor

EXCLUSION: ARM3109

***ARCH 6102.02: Buildings in Perspective.**

One or more buildings will be examined as art, as part of a stylistic development, and as an expression of a particular historical period. Emphasis also will be placed upon research methodologies in the history of architecture.

INSTRUCTOR: J.P. McAleer

FORMAT: Lecture/seminar 1.5 hours

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

EXCLUSION: ARM3116

***ARCH 6103.02: Topics in Urban Design.**

A theoretical overview of the practice of Urban Design, designed to inform students on the subject in their thesis preparation. Readings in the History and Theory of Urbanism, visual material and critiques of Urban Design competitions will be used to structure the class along a series of topics. Acceptable student work will range from physical design to essay and from specific plan of action to theoretical exploration.

FORMAT: Lecture/seminar 1.5 hours

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

EXCLUSION: ARM3111

***ARCH 6104.02: Women and the Built Environment.**

The objective of this class is to create in students an awareness of the built environment as a feminist issue. Students will study women's roles as consumers, critics and creators of the built environment, and explore the idea that women use and conceptualize it differently than men. The class includes lectures, field trips, student seminar presentations and reaction papers.

FORMAT: Lecture/seminar 1.5 hours

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

EXCLUSION: ARM3115

***ARCH 6105.02: Multimedia in Architecture.**

This class examines the use of various technologies in visualizing, developing, and displaying multimedia presentations of architectural designs. It also considers how architectural design work may be informed by an effective use of multimedia.

INSTRUCTOR: P. Kelly

FORMAT: Lecture/seminar 1.5 hours

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

***ARCH 6106.02: Interdisciplinary Studies for Architecture.**

This class examines affinities between architecture and other disciplines in the arts and/or humanities. It considers specific works and interdisciplinary translations according to their technical means,

theoretical premises and cultural intentions. Students are expected to have a working knowledge of architecture and at least one other discipline.

INSTRUCTOR: S. Parcell

FORMAT: Studio/seminar 1.5 hours

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

***ARCH 6107.02/6108.02/6109.02: Advanced Seminar in Humanities.**

This seminar class focuses on an advanced topic in the humanities. Specific topics may change from year to year.

FORMAT: Seminar 1.5 hours

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

EXCLUSION: ARM3113/3117/3119

***ARCH 6110.02/6111.02/6112.02: Advanced Seminar in Computer Applications.**

This seminar class focuses on an advanced topic in computer applications. Specific topics may change from year to year.

FORMAT: Seminar 1.5 hours

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

EXCLUSION: ARM3114/3118/3120

***ARCH 6113.02/6114.02/6115.02: Research Studies in Humanities.**

This class invites student involvement in a current research project by a faculty member.

FORMAT: Studio/seminar 1.5 hours

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

EXCLUSION: ARM4101/4103/4105

***ARCH 6116.02/6117.02/6118.02: Research Studies in Computer Applications.**

This class invites student involvement in a current research project by a faculty member.

FORMAT: Studio/seminar 1.5 hours

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

EXCLUSION: ARM4102/4104/4106

***ARCH 6201.02: Construction.**

This class reviews previously-studied subjects of building construction, with an introduction and consideration of recently introduced materials, to bring students up-to-date in their awareness of constructional options.

FORMAT: Studio/seminar 1.5 hours

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

EXCLUSION: ARM3205

***ARCH 6202.02: Innovations in Architecture and Building.**

This seminar explores influences which may lead to innovations in architectural design and building construction in response to emerging environmental issues and work/lifestyle. Means of study include research, design and making.

INSTRUCTOR: T. Emodi

FORMAT: Seminar 1.5 hours

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

***ARCH 6203.02/6204.02/6205.02: Advanced Seminar in Technology.**

This seminar class focuses on an advanced topic in technology. Specific topics may change from year to year.

FORMAT: Seminar 1.5 hours

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

EXCLUSION: ARM3211

***ARCH 6206.02/6207.02/6208.02: Research Studies in Technology.**

This class invites student involvement in a current research project by a faculty member.

FORMAT: Studio/seminar 1.5 hours

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

EXCLUSION: ARM4201

***ARCH 6301.02: Directed Studies in Professional Practice.**

This class is a directed study, guided by an architectural practitioner, in architectural research related to her or his practice. The research project may be proposed by the practitioner, or by the student in consultation with the practitioner. The project outline must be approved by the chair of the School's Professional Practice teaching group. Refer to the publication, "Guidelines for Directed Studies in Professional Practice".

FORMAT: Seminar, 1.5 hours

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

EXCLUSION: ARM3306

***ARCH 6302.02: Advanced Seminar in Professional Practice.**

This seminar class focuses on an advanced topic in professional practice. Specific topics may change from year to year.

FORMAT: Seminar 1.5 hours

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

EXCLUSION: ARM3303

***ARCH 6303.02: Research Studies in Professional Practice.**

This class invites student involvement in a current research project by a faculty member.

FORMAT: Studio/seminar 1.5 hours

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

EXCLUSION: ARM4302

***ARCH 6401.02/6402.02/6403.02: Personal Project.**

A Personal Project is a term-long, self-directed study proposed by a student and supervised by a faculty member. (Alternately, a qualified person outside the university may supervise the project if a faculty member agrees to act as an advisor.) Like a class outline, a Personal Project proposal must describe the academic objectives, the anticipated product, previous experience in this area, a general schedule, and criteria for evaluating the final work. The proposal must be approved by the supervisor/advisor and the School's Academic Co-ordinator.

RESTRICTION: Graduate students in the Faculty of Architecture, or permission of instructor

EXCLUSION: ARM4401/4402

***ARCH 6404.02/6405.02/6406.02: Extramural Subject.**

A subject of university credit offered by another faculty/university. The subject need not be related directly to a student's architectural studies, but must be a graduate level or advanced undergraduate level (normally, 2000-series or above). To enrol in the class, a student must receive prior approval from the School's Academic Co-ordinator and from other sources specified in the Graduate Regulations. No more than one extramural subject may be taken per term.

EXCLUSION: ARM3400/4400

RESTRICTION: Graduate students in the Faculty of Architecture

ARCH 7001.04: MArch (Post-Prof.) Major Project.

A Major Project is intended to address a question of personal interest and relevance to the field of study. It may be a work of design (accompanied by a written report) or an entirely written document. It is supervised by a faculty member, and additional

advisors also may be involved. Unlike a Thesis, a Major Project is not presented formally at an oral defence, nor is it submitted to the DalTech Office of Graduate Studies.

RESTRICTION: MArch (Post-Prof.) students

EXCLUSION: ARM5004

ARCH 7002.04: MEDS Major Project.

A Major Project is intended to address a question of personal interest and relevance to the field of study. It may be a work of design (accompanied by a written report) or an entirely written document. It is supervised by a faculty member, and additional advisors also may be involved. Unlike a Thesis, a Major Project is not presented formally at an oral defence, nor is it submitted to the DalTech Office of Graduate Studies.

RESTRICTION: MEDS students

EXCLUSION: ARM5002

ARCH 9001.16: MArch (First Prof.) Thesis.

Each student formulates a thesis question of personal and disciplinary importance, and pursues it through a design for a building. The work is supervised by a faculty member nominated by the student. The student is expected to become fluent in the history and theory of the topic and to devise an appropriate strategy for carrying out the work. The thesis concludes with a graphic/model presentation, an oral examination, and a formal thesis document that is submitted to the DalTech Office of Graduate Studies. Detailed requirements are described in the MArch (First Prof.) thesis booklet. The thesis requires a minimum of two terms of residence and may extend to a maximum of five terms.

RESTRICTION: MArch (First Prof.) students

EXCLUSION: ARM4001/4002

ARCH 9002.08: MArch (Post Prof.) Thesis.

A Thesis is intended to address a question of personal interest and relevance to the field of study. It may be a work of design (accompanied by a written document) or an entirely written document. The Thesis is guided by a supervisor and an advisor, at least one of whom must be a member of the Faculty of Architecture. The student presents the work at an oral defence, and the thesis document is prepared in accordance with university thesis standards and submitted to the DalTech Office of Graduate Studies.

RESTRICTION: MArch (Post-Prof.) students

EXCLUSION: ARM5003

ARCH 9003.08: MEDS Thesis.

A Thesis is intended to address a question of personal interest and relevance to the field of study. It may be a work of design (accompanied by a written document) or an entirely written document. The Thesis is guided by a supervisor and an advisor, at least one of whom must be a member of the Faculty of Architecture. The student presents the work at an oral defence, and the thesis document is prepared in accordance with university thesis standards and submitted to the DalTech Office of Graduate Studies.

RESTRICTION: MEDS students

EXCLUSION: ARM5001

Faculty of Computer Science

Location: "MC" Building
1505 Barrington St.
Halifax, NS B3J 3K5
Telephone: (902) 494-2093
Fax: (902) 492-1517
WWW: www.cs.dal.ca

Dean

Slonim, J., BSc, MSc (Western), PhD (Kansas)

Administrative Assistant to the Dean

Publicover, A., BSc (Dal), BA (Dal) Telephone: 902-494-1199

Departmental Secretary - Undergraduate

Poirier, C., BA (Acadia) Telephone: 902-494-2407

Departmental Secretary - Graduate

Steyer, U. Telephone 902-494-2093

I. Introduction

Computer Science is a core high-technology discipline and an integral and indispensable part of technical education. The mission of the Faculty of Computer Science is to provide excellent teaching to our students and to conduct research of the highest quality in specific areas within Computer Science, with emphasis on major research programs with Industry's support and participation. The major research foci will be Network Centered Computing and Software Engineering.

The Faculty was formed on April 1st, 1997, following the amalgamation of the Technical University of Nova Scotia and Dalhousie University. Its members came from the School of Computer Science at TUNS and the Computing Science Division of the Department of Mathematics, Statistics and Computing Science at Dalhousie. The faculty will experience considerable growth over the next few years in all aspects: faculty complement, student enrolment, funding levels and facilities. A new computer science building is planned for August, 1999. We are in the middle of rationalizing our class offerings. The most up to date information will be found on our website: www.cs.dal.ca.

Computer Science

Location: "MC" Building
1505 Barrington St.
Halifax, NS B3J 3K5
Telephone: (902) 494-2093
Fax: (902) 492-1517
WWW: www.cs.dal.ca

Dean

Slonim, J., BSc, MSc (Western), PhD (Kansas)

Professors

Bodorik, P., BSc (Calgary), MEng, PhD (Carleton)
Cox, P.T., BSc, MSc (Auckland), PhD (Waterloo)
Grundke, E. W., BSc, MSc (Dalhousie), PhD (Waterloo)
Hitchcock, P., MA (Oxford), PhD (Warwick)
Jost, A., BSc, MSc, PhD (Dalhousie)
Pietrzykowski, T., MS (Warsaw), PhD (Polish Academy of Science)
Riordan, D., BSc, MSc (Port Elizabeth), PhD (Carleton)
Shepherd, M., MSc, PhD (Western)
Slonim, J., BSc, MSc (Western), PhD (Kansas)

Associate Professors

Farrag, A., PhD (Alberta)
Scrimger, J.N., BSc (UBC), MSc, PhD (Western Ontario)
Smedley, T. J., BMath, MMath, PhD (Waterloo).
Srinivas, S., BEng (Bangalore), PhD (Ind Inst of Sc)

Assistant Professors

Gao, Q., MASC, PhD (Waterloo)
Rau-Chaplin, A., BCompSc (York), MCompSc, PhD (Carleton)
Sedgwick, A., MS (Wisconsin), PhD (Tor)

Computer Systems Manager

Trueman, D., M.Sc. (Tor)

Lecturers

Trueman, D., M.Sc. (Tor)
Gates, C., B.Sc., M.Sc. (Dalhousie)

Adjunct Professors

Eberbach, E. M.Sc., Ph.D. (Warsaw University of Technology),
Acadia University
Hartzman, C., MSc (Toronto), PhD (Colorado)
Moriarty, K.J.M., M.Sc. (Dal), Ph.D. (Lond)
Muir, P., M.Sc., Ph.D. (Tor)
Oliver, L., M.Sc. (Acadia) Ph.D. (McG)
Phillips, W. J., B.Sc., M.Sc. (Queens), Ph.D. (U.B.C.), major
appointment with the Department of Engineering Math
Robertson, W., B.Sc., M.Sc. (Aberdeen), Ph.D. (TUNS), major
appointment with the Department of Electrical and Computer
Engineering
Trudel, A., B.Sc., M.Sc., Ph.D. (Waterloo), Acadia University
Watters, C.R., M.Sc. (Western), Ph.D. (TUNS), Acadia University

Adjunct Assistant Professors

Jutla, D. N., B.Sc. (U. W. Indies), MSc, Ph.D. (TUNS)
MacLeod, K., B.Sc. (St. Francis Xavier U.), M.Comp.Sc., Ph.D.
(TUNS)

I. 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 Computer Science. These classes are:

CSCI 1200.03: Microcomputer Applications.

A class designed for the humanities and social sciences but probably of interest to students in other disciplines as well.

CSCI 3101.03: Computers and Society.

A class that should be of interest to students in all disciplines.

II. Degree Programmes

A. Continuing Students

The Amalgamation Agreement stipulated that those students who were admitted to degree programmes before the academic year 1998/99 be permitted to continue with those programmes under the regulations in force when they entered the programme, provided that they graduate before May, 2002.

B. Current Degree Programmes

The Faculty offers the degree of Bachelor of Computer Science. This requires twenty credits.

Year 1

- 2 Computer Science classes
- 1 Calculus class *
- 1 Linear Algebra class *
- 2 Science classes with labs
- 2 Classes in English or involving English writing (chosen from the Faculty of Computer Science list)
- 2 Elective classes

Year 2

- 4 Computer Science classes
- 1 Discrete Mathematics class *
- 1 Probability and Statistics class *
- 1 Class in Business or Economics
- 1 Technical Writing class
- 2 Elective classes at the year 2 level or beyond

* May be taken in Year 1 or Year 2

Years 3 and 4

- 10 Computer Science classes
- 3 Classes approved by the Faculty of Computer Science
- 1 Science or Engineering class
- 1 Ethics class
- 1 Humanities or Social Sciences class
- 4 Elective classes at the year 3 level or beyond

Specific class selections must be made from a list provided by the Faculty of Computer Science. It is our intention to use this framework as the basis for an Honours programme in Computer Science and for programmes which will provide a specialization in particular areas. However, all the programmes likely will have their first two years in common.

C. Other Programmes

Note that the following degree programmes are under review: Bachelor of Science with a major in Computing Science, Bachelor of Science with an Advanced Major in Computing Science and Bachelor of Science with Honours in Computing Science.

In addition to Departmental requirements listed below, please also see Degree Regulations, page 34.

A. Bachelor of Science with Honours in Computing Science

Departmental Requirements

1000 level

- CSCI 1100.03
- CSCI 1101.03
- MATH 1670.03

2000 level

- CSCI 2111.03
- CSCI 2120.03
- CSCI 2110.03
- CSCI 2113.03
- CSCI 2130.03
- Two and one-half other credits at or above the 2000 level - not including classes listed below

3000 level

- CSCI 3111.03
- CSCI 3140.03
- CSCI 3121.03
- CSCI 3120.03

4000 level

- Two credits at the 4000 level chosen in consultation with the Honours Advisor
- Computing Science Honours Thesis (see below)

Other Required Classes

- MATH 1000.03
- MATH 1010.03
- MATH/STAT 2060.03
- MATH 2080.03
- MATH 2030.03
- MATH 2040.03

Note that a total of 9 credits in the major subject above the 1000 level are required for all Honours programmes.

B. Bachelor of Science with Honours Co-op in Computer Science

Departmental requirements are the same as for the Honours programmes above, with the addition of the following:

- Co-op Seminar 8700.00: to be taken prior to the student's first work term;
- 4 Co-op Work Terms: CSCI 8891.00, 8892.00, 8893.00, 8894.00

Students in the Co-op programmes should see the section below on Co-operative Education.

Combined Honours

Students interested in taking honours in Computer Science and another subject as a combined programme should consult the honours advisor through whom a suitable class 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.

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. Fourth-year Honour students should register for the Honours Seminar, CSCI 8870.00.

C. Bachelor of Science with Advanced Major in Computer Science

Departmental Requirements

1000 level

- CSCI 1100.03
- CSCI 1410.03

2000 level

- CSCI 2111.03
- CSCI 2120.03
- CSCI 2110.03
- CSCI 2130.03
- One other credit in Computer Science 2000 - 4000 level

3000 level

- CSCI 3121.03
- CSCI 3111.03
- CSCI 3140.03
- CSCI 3120.03
- One other 3000 level or above credit in Computer Science

Other Required Classes

- MATH 1000.03
- MATH 1010.03
- MATH 2030.03

D. Bachelor of Science with Advanced Major Co-op in Computer Science

Departmental requirements are the same as for the Advanced Major above with the addition of the following:

- Co-op Seminar 8700.00: to be taken prior to the student's first work term;
- 4 Co-op Work Terms: CSCI 8891.00, 8892.00, 8893.00, 8894.00

Students in the Advanced Major Co-op should see the section below on Co-operative Education.

E. Bachelor Science with Major in Computer Science
Majors in Computer Science must obtain at least four (and no more than eight) credits beyond the 1000 level in Computer Science.

Departmental Requirements

- 1000 level: CSCI 1100.03 and 1101.03
- 2000 level: CSCI 2130.03, 2111.03, 2120.03, 2110.03
- 3000 level: CSCI 3111.03 and 3120.03 plus one other credit at or above the 3000 level

Other Required Classes

MATH 1000.03 and 1010.03, MATH 2030.03

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.

D. Co-operative Education Programmes

All programmes except the BSc Major in Computer Science will have a Co-operative Education option. This requires the completion of four Co-op work terms.

The DalTech Co-op office receives requests from employers for Co-op placements and advertises these to qualifying students. Students apply for these positions and are interviewed by the employer.

E. Entry Points

There are three main entry points into the Bachelor of Computer Science programme:

1. **First-Year Entry** - Students are advised to apply directly to the Faculty of Computer Science but may take their classes within the BSc first year and transfer to Computer Science at the beginning of their second year.
2. Applicants who already have some credits at the post-secondary level may apply for entry into the accelerated programme. If accepted they will be able to enter the third year of the programme after one year of study.

3. Students who have completed the requirements of the first two years at the Associated Universities will be able to apply for entry into the third year of the programme.

Students who wish to transfer to the Bachelor of Computer Science programme from other disciplines will be able to do so, but will have to make up any required classes that are missing.

F. Accreditation and the Profession

The co-operative programme offers work terms to our students, thus providing an additional link between the Faculty and the Profession. Of particular importance to the Faculty is the accreditation of the undergraduate program by the Canadian Information Processing Society (CIPS) which is responsible for certification of computer professionals and accreditation of computer science programs in Canada. Accreditation provides our graduates with an accelerated path towards achieving the professional designation of Information Systems Professional of Canada (I.S.P.).

The work terms of the program are accredited by the Canadian Association for Co-operative Education (CAFCE).

G. Equipment

Equipment used for teaching and research includes laboratories of Macintosh and IBM compatible microcomputers, x-terminals and a network of Hewlett-Packard, DEC and SUN workstations and servers running UNIX.

H. Information and Application Forms

Contact the Faculty office by phone at (902) 494-2093.

Application forms may be obtained from

The Registrar
Dalhousie University
Halifax, N.S.
B3H 4H6

The Registrar's website is www.registrar.dal.ca/apps.

I. Scholarships

Scholarships and bursaries are available to both new and returning students. See the Awards and Financial Aid section of this calendar.

III. Academic Regulations

In addition to the regulations below, please see Academic Regulations section, page 23.

Workload

A normal class load is five classes during each study term.

Grades

- (a) Class instructors will describe methods of student evaluation at the first meeting of each class.
- (b) Supplementary examinations are not given in Computer Science classes.
- (c) A grade of at least C is required to meet prerequisite conditions for more advanced classes.
- (d) A class grade is called successful if it is high enough to obtain credit and meet any prerequisite conditions for other mandatory classes.

Dismissal

A student who either meets the conditions for dismissal as outlined in Section 21, Dismissal, page 30 or fails more than one co-op work term will be dismissed from the programme.

An application for readmission to the programme may be considered two terms after dismissal. A student may be readmitted to the programme only once. A readmitted student is considered to be on probation.

III. Classes Offered

CSCI 1100.03: Computer Science I.

This class provides a general introduction to computer science and the hardware and software of computers. The main focus is on programming skills in Java and how to apply these skills in solving a variety of problems. Algorithmic concepts are stressed.
PREREQUISITE: Nova Scotia Math 441 or equivalent
EXCLUSIONS: CS1100, COMP 1400.03

CSCI 1101.03: Computer Science II.

This class is a continuation of CSCI 1100.03. It focuses on Java programming and linear data structures.
PREREQUISITE: CSCI 1100.03 or CSCI 1102.03
EXCLUSION: CS1101, COMP 1410.03

CSCI 1102.03: Dalhousie Integrated Science Programme.

This class is the Computer Science component of the Dalhousie Integrated Science Programme (DISP).
PREREQUISITE: See DISP

CSCI 1200.03: 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 design and implement models in mathematics, the sciences, and the social sciences. The proper design of database schemas 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 class. Students will write essays based on these issues using word processing software. Some sections of this class use PC microcomputers, the others use Macintosh computers. Students will also be introduced to the resources available on the Internet and the "World Wide Web" of hypermedia hypertext.
EXCLUSION: COMP 1000.03

CSCI 2100.03: Communication Skills: Oral and Written.

This class is designed to help students become more successful communicators by examining the communication process from both a theoretical and practical viewpoint. Students learn to formulate communication goals, to examine their audience and to deliver accurate, effective messages. Written assignments and oral presentations allow for the development of these skills through practice. Students ultimately learn to communicate effectively and with confidence in a variety of settings.
EXCLUSION: CS3100

CSCI 2110.03: Computer Science III.

This class is a continuation of CSCI 1101.03. It uses Java and emphasizes data structures and algorithms.
PREREQUISITE: CSCI 1101.03
EXCLUSION: CS2110, COMP 2610.03

CSCI 2111.03: Data and File Structures.

This class investigates the application of analysis and design techniques to data and file structures. Particular topics covered by the class may include balanced search trees, hashing methods and graphs. The class also provides an introduction to Database Management Systems.
PREREQUISITE(S): CSCI 2110.03
EXCLUSION: CS2111, COMP 2350.03

CSCI 2112.03: Discrete Structures I.

See class description for MATH 1670.03 in the Mathematics section of this calendar.
PREREQUISITE: See MATH 1670.03.
EXCLUSION: COMP 1670.03

CSCI 2113.03: Discrete Structures II.

This class continues CSCI2112.03/MATH1670.03. This class 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 algebra.
FORMAT: Lecture 3 hours
PREREQUISITE: MATH 1670.03.
CROSS-LISTING: MATH 2670.03
EXCLUSION: COMP 2670.03

CSCI 2120.03: Assembly Language Programming.

This class uses assembly language programming to give Computer Science students a detailed view of computer systems. Topics include data representation, machine organization, assembly language, instruction set, data structures, high-level language environments, in-line assembly and mixed language programming.
PREREQUISITE: CSCI 1101.03
EXCLUSION: CS2120, COMP 2450.03

CSCI 2130.03: Programming Languages.

With Java as a reference point, other languages such as C++, LISP and Prolog are introduced. The emphasis is on fundamental concepts such as block structure, recursion and structured control flow. Recursion and functional programming are discussed.
PREREQUISITE: CSCI 2110.03
EXCLUSION: CS2130, COMP 2700.03

CSCI 2131.03: Topics in Applied Computer Science.

This class consists of several independent modules designed to equip students with practical skills before the first co-op work term. Topics include C programming, networks, database systems and software engineering.
PREREQUISITE: CSCI 1101.03
EXCLUSION: CS3133

CSCI 3101.03: Social, Ethical and Professional Issues in Computer Science.

A case study approach will be taken and will include the following topics. Social context of computing: methods and values in common with and distinct from those of other professionals, potentially controversial computer applications. Professional responsibilities: professional ethics, information security and privacy, ethical choices. Risks and liabilities: types of risk and loss, losses and liability. Intellectual property: definition, means of protection, infringement and penalties.
EXCLUSION: CS3101, COMP 3090.03

CSCI 3110.03: Analysis of Algorithms I.

This class covers techniques for the design and analysis of efficient algorithms and data structures. Topics include: asymptotic analysis, divide and conquer, greedy algorithms, dynamic programming, data structure design, optimization algorithms, and amortized analysis. The techniques are applied to problems such as sorting, searching, graphs, and set manipulation.
PREREQUISITE: CSCI 2111.03
EXCLUSION: CS3110

CSCI 3111.03: 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 programme libraries such as Linpack, Eispack and Matlab.
FORMAT: Lecture 3 hours
PREREQUISITE: MATH 1010.03, MATH 2030.03, COMP 1410.03, or CSCI 1101.03
CROSS-LISTING: MATH 3170.03
EXCLUSION: COMP 3170.03

CSCI 3120.03: Operating Systems.

This class includes a review of I/O and interrupt structures, addressing schemes, and microprogramming. Other topics covered include dynamic procedure activation, system structure and evaluation, memory management, process management, recovery procedures, concurrent processors, name management, resource allocation, protection, and operating systems implementation.

PREREQUISITE: CSCI 2111.03.

EXCLUSION: CS3120, COMP 3700.03

CSCI 3121.03: Computer Organization and Assembly Language.

This class examines the fundamentals of computer organization, including digital logic, ALU and CPU design, and CISC and RISC architectures. Assembly language is studied as a tool for understanding the computer's object code.

PREREQUISITE: CSCI 2111.03, CSCI 2130.03.

EXCLUSION: CS3121, COMP 3040.03

CSCI 3122.03: Microcomputers and the Real World.

See the description of PHYC 3810.03.

PREREQUISITE: See PHYC 3810.03.

EXCLUSION: COMP 3810.03

CSCI 3123.03: Digital System Design.

This class introduces students to fundamental principles of digital system design, with emphasis on the design of synchronous state machines. Topics include a review of boolean functions and gates, algorithmic state machines, logic minimization, multiplexers, decoders, registers, counters, memories, programmable logic arrays, flip-flops, synchronous counters, clocks, races and hazards, and synchronous ASM's.

PREREQUISITE: CSCI 3121.03

EXCLUSION: CS3123

CSCI 3130.03: Introduction to Software Engineering.

The class examines the process of software development, from initial planning through implementation and maintenance. A brief survey of available tools and techniques will be presented covering the topics of analysis, planning, estimating, project management, design, testing, and evaluation. Particular emphasis will be given to organizing and planning, team participation and management, top-down design and structure charts, system and information flow diagrams, walk throughs and peer review, and testing and quality control.

PREREQUISITE: CSCI 2131.03

EXCLUSION: CS3130, COMP 4140.03

CSCI 3132.03: Object Orientation.

This class deals with the fundamental concepts of object-oriented programming: behaviour, inheritance, encapsulation and polymorphism. There is a discussion of the history of object-oriented programming, and introduction to some currently used object-oriented programming languages, such as Smalltalk, C++ and Prograph.

PREREQUISITE: CSCI 2111.03, CSCI 2130.03

EXCLUSION: CS3132, COMP 4350.03

CSCI 3134.03: Functional and Logic Programming.

These two important programming paradigms are covered from both the theoretical and implementational perspectives. Interpreters for both LISP and PROLOG are provided and form the basis for the programming component of the class. This class is a useful corequisite or prerequisite to any Artificial Intelligence studies.

PREREQUISITE: CSCI 2130.03

EXCLUSION: CS3134

CSCI 3135.03: Software Development Using Ada.

Fundamentals of the Ada language, object-oriented design and programming, tasks, concurrency, exception handling and other topics such as real-time embedded systems, program support environments, software development considerations and Ada compiler validation.

PREREQUISITE: CSCI 2130.03

EXCLUSION: CS3135

CSCI 3140.03: Database Management Systems.

The class provides an introduction to Database Management Systems (DBMSs). It covers various topics such as data models, relational algebra and calculus, SQL, DB design, query languages, query optimization, concurrency control and recovery. Assignments and projects will require use of a DBMS(s).

PREREQUISITE: CSCI 3120.03, CSCI 2131.03

EXCLUSION: CS4140, COMP 3250.03

CSCI 3150.03: Artificial Intelligence.

This class gives a basic exposition of the goals and methods of Artificial Intelligence (AI) for problems in science, engineering, business and entertainment. It emphasizes how knowledge can be represented and what conclusions can be drawn from searching and reasoning about that knowledge. A secondary objective is to introduce several AI fields in order to enable further in-depth study.

PREREQUISITE: CSCI 2110.03, CSCI 3134.03

EXCLUSION: CS4150, COMP 3750.03

CSCI 3220.03: Computer Organization for Electrical Engineers.

This class is designed to give students of Electrical Engineering a detailed view of a computer system in order to bridge the gap between programming languages and digital systems. Topics: Higher-level languages, assembly language, software development, data representation, machine language code, assemblers, loaders, linkers, system organization and architecture, practical assembly language programming.

PREREQUISITE: CSCI 1101.03 or equivalent.

EXCLUSION: CS3220

CSCI 4110.03: Mathematical Logic for Computer Science.

This class introduces the student to propositional calculus, including its motivation, origin and syntax, and the interpretation, satisfiability and validity of semantics. Techniques of establishing validity (unsatisfiability) of a formula, such as boolean tables, the tableaux method and the resolution principle are discussed. The motivation and syntax of predicate calculus are introduced, along with the algebra of substitutions, the resolution principle, and temporal logic and its applications.

PREREQUISITE: CSCI 3110.03

EXCLUSION: CS4110

CSCI 4111.03: Design and Analysis of Parallel Algorithms.

This class covers the design and analysis of algorithms for massively parallel architectures, such as hypercubes, meshes, pyramids and PRAM. Algorithmic techniques and both upper and lower bounds will be considered for many fundamental computational tasks including sorting, searching, and routing. Other applications will be selected from areas such as, numerics, graph theory, computational geometry, image processing and graphics.

PREREQUISITE: CSCI 3110.03

EXCLUSION: CS4111

CSCI 4112.03: Theory of Computation.

This is a class on formal languages and computational models. Topics covered include finite automata, pushdown automata, Turing machines, undecidability, recursive and recursively enumerable functions. Some applications to computer science are also discussed, such as compiler design and text processing.

PREREQUISITE: CSCI 2112.03

EXCLUSION: CS4112, COMP 4660.03

CSCI 4113.03: Analysis of Algorithms II.

This class covers advanced techniques for the design and analysis of efficient algorithms. Problems are taken from a wide range of areas including combinatorics, numerical computation, graph algorithms, string matching, approximation algorithms, computational geometry, NP-Completeness.

PREREQUISITE: CSCI 3110.03

EXCLUSION: COMP 4130.03

CROSS-LISTING: MATH 4130.03

CSCI 4114.03: Formal Aspects of Software Engineering.

This class deals with formal specifications of software, techniques for verification of computer programs and software testing.

PREREQUISITE: CSCI 3130.03

CSCI 4121.03: Computer Architecture.

The class will focus on the basic principles of computer architecture with an emphasis on quantitative analysis of the effect of architectural design decisions on system performance and the price/performance trade-offs necessary in real computer design. This includes instruction set design issues (CISC vs. RISC), instruction level parallelism, implementation methods, pipelining, pipeline hazards, interrupts, the relationship with compiler technology, and memory system design. Several representative architectures will be used as examples, with emphasis on modern RISC processors.

PREREQUISITE: CSCI 3120.03, CSCI 3121.03

EXCLUSION: CS4121

CSCI 4122.03: Software Design Methods for Real Time Systems.

This class will include the following: real time executives, architectures for real time systems, design methods, concurrency and synchronization, resource allocation, error handling and safety issues.

PREREQUISITE: CSCI 3120.03, CSCI 3130.03

EXCLUSION: CS4122

CSCI 4123.03: Topics in Vector and Parallel Computing.

This class is designed to provide a wide range of concepts involved in vector and parallel supercomputing. Topics covered include pipeline and vector processing, SIMD and MIMD processing, interconnection networks, parallelization techniques, parallel algorithm design strategies. Architecture and applications of prominent supercomputing systems will be discussed.

PREREQUISITE: CSCI 3111.03, CSCI 3121.03

EXCLUSION: COMP 3350.03

CSCI 4131.03: Compiler Construction.

An introduction to the major methods used in compiler implementation. Topics include lexical analysis and parsing methods, symbol table construction, run-time storage management, and code optimization.

PREREQUISITE: CSCI 3110.03

EXCLUSION: CS4130, COMP 4150.03

CSCI 4132.03: Personal Software Process.

This class deals with the Personal Software Process, which is designed to control, manage and improve the way individuals produce software.

PREREQUISITE: CSCI 3130.03

EXCLUSION: COMP 4400.03

CSCI 4133.03: Application Frameworks.

This class examines the theory and practice of modern application frameworks.

PREREQUISITE: CSCI 2131.03, CSCI 3132.03

CSCI 4141.03: Information Retrieval.

This class examines information retrieval within the context of full text databases. Topics include the major models of information retrieval, evaluation, searching and clustering, and hypertext.

PREREQUISITE: CSCI 2111.03

EXCLUSION: COMP 4250.03

CSCI 4142.03: Multimedia Information Systems.

There are three parts to this class. The first part concentrates on the characteristics of audio, image, and video, including their digital representation and compression. The second part of the class concentrates on storage models, retrieval and orchestration. This will include such systems as those for computer supported collaborative work and telemedicine. The final part of the class will cover middleware models for distributed multimedia systems.

PREREQUISITE: CSCI 3120.03 or permission of the instructor.

Students should be comfortable in a UNIX environment, with a GUI such as XView or tcl/tk, and with C, C++, or Java.

EXCLUSION: COMP 4650.03

CSCI 4143.03: Advanced Topics in Database Design.

Topics vary from year to year depending on the interests of the students and the instructor. Past topics have included concurrency control, scheduling, query optimization and object-oriented databases.

PREREQUISITE: CSCI 3140.03

EXCLUSION: COMP 4700.03

CSCI 4151.03: Topics in Artificial Intelligence.

This class introduces artificial intelligence application development. Topics covered include learning systems, expert systems, data mining and perception.

PREREQUISITE: CSCI 3150.03

EXCLUSION: COMP 4200.03

CSCI 4160.03: Computer Graphics.

Vision and colour, mathematical algorithms of co-ordinate geometry to draw fast curves on computer systems. Display files and pages.

Two and three dimensional graphics. Perspective drawings and hidden line problems. Vector and raster graphics and their application to shading, colour and animation. Analysis of computer graphics systems from point of view of hardware, software and application software.

PREREQUISITE: CSCI 2131.03

EXCLUSION: CS4160, COMP 4670.03

CSCI 4161.03: User Interface Design.

This class deals with the concepts and techniques underlying the design of interactive systems. Both the human factors and the technical methods of user interface design are covered.

Topics from user interface implementation will also be examined.

PREREQUISITE: CSCI 2131.03, CSCI 3132.03

EXCLUSION: CS4161

CSCI 4162.03: Introduction to Multimedia.

This class is intended to introduce students to the emerging field of Multimedia. Various media types, including both low level topics such as file formats, compression, and decompression, will be discussed, as well as high level tools for manipulating audio, video, graphics and animations. We will look at various tools and formats for creating and presenting interactive multimedia applications.

PREREQUISITE: CSCI 3132.03

EXCLUSION: CS4162

CSCI 4170.03: Data Communications.

This class introduces the seven-layer OSI model for data communications and examines the issues in the lowest three layers. Topics include data encoding and transmission techniques, data link control, packet switching and local area networks.

PREREQUISITE: CSCI 3120.03, CSCI 3121.03

EXCLUSION: CS4170, COMP 4450.03

CSCI 4171.03: Computer Communication Networks.

This class gives students a foundation in the study of computer networks. Current methods and practices in the use of computer networks to enable communication are covered. Also covered are the physical and architectural elements and information layers of a communication network, along with diagnostic, design, operational, and performance measurement tools that are used to implement, operate, and tune such a network. Different network architectures are contrasted, and compared with traditional mainframe and time-shared computer models. Important subtopics include network architecture and communication protocols, network elements, data link, switching and routing, end-to-end protocols, LANs, and data security.

PREREQUISITE: CSCI 3120.03, CSCI 3121.03

EXCLUSION: CS4171, COMP 4550.03

CSCI 4172.03: Internetworking.

The objective of this class is to provide a comprehensive discussion on the protocols, architectures and software for internetworking and current trends in this area. Topics covered include TCP/IP, routing protocols and algorithms, network architectures, distributed systems, ATM, traffic management and applications.

PREREQUISITE: CSCI 4171.03

CSCI 4190.03: Special Topics In Computer Science.

This class examines topics determined by the interests of the students and the instructor.

PREREQUISITE: Permission of the instructor.

EXCLUSION: CS4190

CSCI 4191.03: Application Development Project.

This is a project-oriented class. Students work in teams to develop applications that solve problems for real clients. Lectures deal with topics needed to support the projects, and may include topics such as application frameworks and world-wide web programming.

PREREQUISITE: CSCI 3101.03, CSCI 3130.03, and CSCI 3132.03 or equivalent.

EXCLUSION: CS4191

CSCI 4192.03: Directed Studies.

Faculty of Engineering

Dean

Bell, A.C., BSc (Dal), BEng (TUN5), SM (MIT), ScD (MIT), PEng
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Associate Dean, Undergraduate and Associated Universities

El-Hawary, M. E., BEng (Alexandria), PhD (Alberta), PEng

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Studley Location: Room 326
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(902) 494-2580
Fax: (902) 494-2581

I. Engineering as a Profession

Engineering is one of the most important of the professions. Virtually all aspects of modern life are involved with this fascinating discipline. Engineering education at Dalhousie is demanding, because the engineering profession is demanding. Society expects its technical problem solvers to offer answers to some of the most difficult questions around-questions related to the environment, productivity, communications, transportation, and more. In general, the engineering enterprise contributes not only to human welfare, but also to the sustainable development of our resources. Engineering education provides great rewards for the engineer of the future. Specifically, there is the personal satisfaction of following a career where one's personal expertise can benefit fellow humans and contribute to the making of a better world.

The Faculty of Engineering at Dalhousie University prepares its students with the problem-solving skills needed for lifelong exploration in a field that answers some of today's most pressing concerns. The Faculty of Engineering has an excellent tradition of providing engineering education for students in the Atlantic Provinces that started in 1907 with the founding of the Nova Scotia Technical College. Our graduates can be found in important positions throughout Canada and in many other countries.

The Faculty of Engineering offers undergraduate curricula leading to the degree of Bachelor of Engineering in the following eight disciplines:

- Biological Engineering (including bio-systems and environmental engineering options)
- Civil Engineering
- Chemical Engineering
- Electrical and Computer Engineering
- Industrial Engineering
- Mechanical Engineering
- Metallurgical Engineering
- Mining Engineering

The Faculty also offers post-graduate studies at the master's and doctoral level.

The preparation for an engineering career includes both formal academic studies at a university and intensive training in the practice of engineering. A similar pattern is to be found in preparation for careers in medicine or law, and is characteristic of any development of professional competence. The Co-operative Engineering program in the Faculty of Engineering provides a completely integrated pattern of academic study and industrial experience in various phases of engineering with ultimate graduation requiring satisfactory performance in both areas. All programs are offered in a co-operative format. Electrical and Computer Engineering and Mechanical Engineering both have a co-operative internship. Engineering disciplines offering co-operative programs schedule work periods in industry at various times of the year. This sequencing may vary according to the discipline, details of which are outlined in the curricula in this calendar.

The degree program covers almost five calendar years, comprising eight or nine terms (depending on the area of specialization) each of about four months' duration of university work on campus which are pursued alternately with four-month terms of supervised training in the practical experiences fundamental to the development of the graduate engineer. In a typical program of study, the total time spent in academic study is the same as that encountered in the usual course of four academic years.

Graduation from the University is only the introduction to an engineering career, and the beginning of a lifelong learning experience. After completion of formal studies leading to the Bachelor of Engineering degree, four years of suitable experience are required as a condition of admission to the profession of Engineering.

The practice of engineering is regulated, by statute, in all Canadian provinces and territories. To become a Professional Engineer you must satisfy the requirements of the licensing bodies. These requirements include a degree from an accredited program, successful completion of a professional practice (law and ethics) examination, and suitable experience. Accreditation of the degree programs by the CEAB is the mechanism by which graduates qualify for registration as Professional Engineers without the need to undertake additional examinations in specific technical subject areas. The B. Eng. programs described in this calendar have been specifically designed to satisfy the criteria of the Profession and are evaluated regularly by the Canadian Engineering Accreditation Board (CEAB) of the Canadian Council of Professional Engineers. The Faculty will not graduate any student who does not meet these requirements because this would jeopardize accreditation for the program. The department responsible for the appropriate program will use these curriculum content requirements in determining the suitability of student elective course selections. The baccalaureate programs in all disciplines are accredited by the Canadian Engineering Accreditation Board.

II. Degree Programmes

A. Bachelor of Engineering

Students who have successfully completed the academic study programme in any of the disciplines will be granted the degree of Bachelor of Engineering.

B. Bachelor of Engineering with Distinction

Students who have successfully completed the requirements for the degree of Bachelor of Engineering, and have obtained a Cumulative Grade Point average of at least 3.7, will be granted the degree of Bachelor of Engineering with Distinction.

C. Bachelor of Engineering with Sexton Scholar Designation

Dr. F.H. Sexton was the President of the Nova Scotia Technical College since its establishment in 1909 until his retirement in 1947. To honour his contributions, the Faculty of Engineering designates as a Sexton Scholar, each undergraduate student who has taken a full class load and obtained a cumulative Grade Point Average of at least 4.0 or higher with no failed marks during their programme beginning in Academic Term 5.

D. Co-operative Programme Designation

Students who have successfully completed the requirements for the degree of Bachelor of Engineering and who, in addition, have accumulated 1400 or more hours of approved work experience, will receive the "Co-operative Programme" designation on their degree.

E. Master of Applied Science

Students who have successfully completed the class requirements for the degree and who have submitted and defended orally an acceptable thesis, will be awarded the degree of Master of Applied Science.

F. Master of Engineering

Students who have successfully completed the class requirements for the degree and submitted an acceptable project report, will be awarded the degree of Master of Engineering.

G. Master of Science

Students who have successfully completed the class requirements for the degree in Engineering Mathematics or Food Science and who have submitted and defended orally an acceptable thesis or project report, shall be awarded the degree of Master of Science.

H. Doctor of Philosophy

Students who have successfully completed the class requirements for the PhD degree, passed their comprehensive examination, and submitted and defended orally a satisfactory thesis, will be awarded the degree of Doctor of Philosophy.

Engineering

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II. Admission Requirements and Procedures

Students wishing to enroll in the Bachelor of Engineering Programme in the Faculty of Engineering must meet the following requirements:

- Minimum of 65% in English and Mathematics 441 or equivalent;
- Minimum of 65% in Physics and Chemistry.

Students must rank well in their classes as admission to Engineering at Dalhousie is competitive. Students may be admitted with advanced standing.

Students wishing admission with advanced standing in the BEng Degree programme are advised that at least one third of the class work must be completed at Dalhousie. Transfer of credits will not be granted for any class in which a final grade was less than C or equivalent, or for any class in which a final grade was granted conditionally.

Admission and registration for the Associated University programme is the responsibility of the Associated University. Students interested in studying engineering should contact the Associated University of their choice. On completion of the engineering programme at the Associated University, each student may be granted a certificate or diploma. To enter the Faculty of Engineering at Dalhousie, students must complete an Application for Admission form (available from the Registrar's Office), and submit his or her form plus an official transcript of their Associated University academic record verifying completion of the programme entrance requirements to the Registrar by the date shown on the application form.

A student from an Associated University must apply for entry to Dalhousie at the end of year one to reserve a place for year two or year three of the programmes.

Students who wish to enter the Faculty of Engineering and who have completed a programme equivalent to that offered by the Associated Universities should submit complete transcripts of their university studies to the Registrar's Office prior to June 1. Such students will be placed in the programme at a level determined by the Faculty of Engineering if they meet the entry and promotional requirements of the Faculty of Engineering.

Applicants for the Bachelor of Engineering programme cannot be guaranteed that they will gain entry to the department of their choice since all departments are subject to a known maximum number of annual admissions. Thus students are required to specify their choice of at least three departments, in preferential order, and at a predetermined date departments will select students for admission, the basis for selection being the academic performance of the applicants.

The Faculty permits persons not registered for a degree at the University to enroll in individual classes. Such students are referred to as non-degree students. Registration takes place on the dates shown in the Calendar of Events.

Enquiries and Applications for Admission should be directed to:

Registrar's Office
Dalhousie University
Halifax, Nova Scotia
B3H 3J5

III. The Associated University Program

The Bachelor of Engineering degree awarded by Dalhousie can also be conferred in association with one of several Associated Universities. The program of studies is then divided into two parts. The Associated Universities offer programmes in engineering covering the first part of the requirements for the degree and the Faculty of Engineering offers classes in the several departments of engineering covering the second part.

The Associated Universities are:

- Acadia University
Wolfville, Nova Scotia
D. Seamone, Director
The Ivan Curry School of Engineering
- University College of Cape Breton
Sydney, Nova Scotia
E. MacLellan, Director
Diploma in Engineering Program

- Nova Scotia Agricultural College
Truro, Nova Scotia
J.D. Cunningham, Head
Agricultural Engineering Department
- St. Francis Xavier University
Antigonish, Nova Scotia
W. Quinn, Chairman
Department of Engineering
- Saint Mary's University
Halifax, Nova Scotia
A. Seaman, External Director
Division of Engineering
- University of Prince Edward Island
Charlottetown, Prince Edward Island
D. Gillis, Chairman

Each of the Associated Universities establishes its own entrance requirements. It is possible to enter some Associated Universities with junior matriculation (Nova Scotia Grade XI) but a preparatory year prior to commencing the engineering programme is then required. Dalhousie University recognizes all of the Associated Universities and ensures proper standards of achievement by means of the Associated Universities Directors of Engineering Committee. The programme at each Associated University contains courses fulfilling the minimum entrance requirements established by the Senate of Dalhousie University. Students who complete the applied science or engineering program at an Associated University may receive a Certificate or Diploma and are normally admitted to the programs in Biological (Biosystems or Environmental Option), Chemical, Civil, Electrical and Computer, Industrial, Mechanical, Mining, or Metallurgical at Dalhousie without examination. Students should ensure that their class selection at the Associated Universities include the discipline specific courses relevant to their program of choice. Not all Associated Universities offer all discipline specific courses, and students should contact the office of the Associate Dean, Faculty of Engineering for details. Students who have completed equivalent university studies elsewhere may also be admitted subject to Dalhousie University Regulations.

Please refer to the Graduate/Professional Calendar for details of graduate programmes offered by the Faculty of Engineering.

IV. Academic Regulations

Students are reminded that the academic regulations stated in the calendar are abridged for reference. In addition to the Academic Regulations section of this calendar, page 23 and the regulations stated below, the current Faculty of Engineering Working Rules also apply to all students. Copies are available to students on request.

Class Grades

A student must achieve a grade of D or greater in each class of the curriculum and satisfy the regulations set out herein in order to graduate.

Where Faculty regulations permit, a student who achieves a grade of FM in a required class may write a supplementary examination to attempt to raise the grade to D or greater. If the grade is not raised to at least D by means of a supplementary examination or if a supplementary examination is not permitted the student must repeat the class. See also Supplementals, page 28.

A student is permitted to repeat a failed mandatory class only once. In the case of a failed elective class, a student may choose either to repeat the class or to substitute another elective class in lieu of the failed class. In the case of a substituted class only one such substitution is allowed. A student will be required to withdraw if the grade achieved in the repeated mandatory class or the repeated elective class or the substituted class is less than D.

Readmission After Required Withdrawal

A student who has been required to withdraw only once from the programme may apply to be readmitted to the same programme after a minimum of two sessions from the time of withdrawal, or, such a student may apply to be admitted to a different programme starting immediately. Readmission may be granted by the Faculty or by the Admissions and Appeals Committee of the Faculty on the recommendation of the Department concerned. A department may readmit a student who has been required to withdraw, subject to special academic conditions set by the department, which are based on an evaluation of the student's academic record by the department. See also Academic Dismissal, page 30.

Scholarships

Only those students who are registered for a full load of classes as measured by the curriculum of the programme concerned will be eligible for scholarships and awards in the Faculty of Engineering.

Supplementary Examinations

Supplementary examinations may be offered to students in order (1) to raise a class grade to at least D, (2) to raise a Session Numerical Average to at least C.

In the case of raising the Session Numerical Average, the supplementary examination will be offered in a class with a grade lower than C.

Only one supplementary examination will be permitted per session. It must be written on the first scheduled date for writing supplementaries for that student's particular class and cannot be postponed or carried forward to a later session.

Supplementary examinations will not necessarily be available for all classes. In addition, the minimum reported final mark required to write a supplementary examination is FM. The Faculty will determine the classes in which supplementary examinations are not available and a list of those classes will be published early in the term.

The class mark resulting from a supplementary examination will replace the original class mark for all purposes.

When a supplementary examination is offered, the mark obtained on the supplementary examination will normally replace the final examination mark in calculating the class grade.

Supplementary examinations will normally be held within one week of the release of session grades. The dates will be published in the Calendar.

See also Supplementals, page 28.

Repeating Students

If changes are made in the curriculum, repeating students will be required to satisfy the new curriculum.

Auditing a Class

See definition of "audit student", page 3.

Students who are registered for a degree in the Faculty must have the approval of the Faculty to audit a class. Such approval can be obtained by submitting a written request to the Dean, who will refer the matter to the Faculty for a decision.

Students who are not registering for a degree in the Faculty must obtain the approval of the instructor to audit a class.

Fees

Information pertaining to fees and expenses is given in the "Fees" section of this Calendar.

Financial Assistance

Information pertaining to Financial Assistance is given in the "Awards and Financial Aid" section of this Calendar.

IV. Programmes Offered

A. Bachelor of Engineering

Students who have successfully completed the academic study program in any of the disciplines will be granted the degree of Bachelor of Engineering.

B. Bachelor of Engineering with Distinction

Students who have successfully completed the requirements for the degree of Bachelor of Engineering, and have obtained a Cumulative Grade Point Average of at least 3.7 will be granted the degree of Bachelor of Engineering with Distinction.

C. Bachelor of Engineering with Sexton Scholar Designation

Dr. F. H. Sexton was the President of the Nova Scotia Technical College since its establishment in 1909 until his retirement in 1947. To honour his contributions the Faculty of Engineering designates as a Sexton Scholar, each undergraduate student who has taken a full course load and obtained a cumulative Grade Point Average of at least 4.0 or higher with no failed marks during their program beginning in Academic Term 5.

D. Co-operative Programme Designation

Students who have successfully completed the requirements for the degree of Bachelor of Engineering and who, in addition, have accumulated 1400 or more hours of approved work experience, will receive the "Co-operative Programme" designation on their degree.

E. Master of Applied Science

Students who have successfully completed the class requirements for the degree and who have submitted and defended orally an acceptable thesis, will be awarded the degree of Master of Applied Science

F. Master of Engineering

Students who have successfully completed the class requirements for the degree and submitted an acceptable project report, will be awarded the degree of Master of Engineering.

G. Master of Science

Students who have successfully completed the class requirements for the degree in Engineering Mathematics or Food Science and who have submitted and defended orally an acceptable thesis or project report, shall be awarded the degree of Master of Science.

H. Doctor of Philosophy

Students who have successfully completed the class requirements for the PhD degree, passed their comprehensive examination, and submitted and defended orally a satisfactory thesis, will be awarded the degree of Doctor of Philosophy.

V. Undergraduate Programmes

A. Bachelor of Engineering

Introduction

The engineering program is designed for students who have completed senior matriculation (Nova Scotia Grade XII) including mathematics, physics, and chemistry, and rank well in their class. Students may be admitted with advanced standing.

At Dalhousie, students benefit from our unique approach to undergraduate engineering education. Renowned for innovation in education, the unique undergraduate engineering curricula at Dalhousie University provide a sound basis in Mathematics and pure Science and in Engineering Science and Design, that are a foundation for success in any engineering career. A substantial part of the work of the first and second years is common to all programmes. Many of these classes will change very little over the course of an engineer's career; they will become a sound basis of life-long learning.

The Faculty of Engineering has seven engineering departments (Biological, Chemical, Civil, Electrical & Computer, Industrial, Mechanical, Mining and Metallurgical), one service department (the Department of Engineering Mathematics) and one applied science department (the Department of Food Science and Technology). Each engineering department, with the exception of one, deals with one undergraduate discipline and is responsible for the degree programme in that discipline. The Department of Mining and Metallurgical Engineering administers degree programmes in the disciplines of Mining Engineering and Metallurgical Engineering.

At the end of Year 1, students submit a "Discipline Choice" form indicating the order of their preference of the eight disciplines. The Faculty of Engineering will inform students who have met the criteria of promotion from Year 1 to Year 2 of their placement in one of the eight principal programs. The curriculum for each of the eight basic programmes combines required 'core' subjects essential to the field, and 'elective' subjects permitting considerable diversity in individual programmes of study. An important part of the curriculum is a series of electives in Complementary Studies. The curriculum for the first year of Engineering at Dalhousie is indicated below. Students should refer to the appropriate departmental chapter once a field of specialization has been determined for subsequent years.

B. Curricula for Terms 1 - 4

Year 1 - Term 1 Fall

- MATH 1000.03: Calculus I
- PHYC 1100.06: Introduction to Physics
- CHEM 1021.03: Engineering Chemistry I
- ENGI 1100.03: Engineering Design & Graphics I
- Writing Class

Year 1 - Term 2 Winter

- MATH 1010.03: Calculus II
- ENGI 1400.03: Mechanics I
- PHYC 1100.06: Introduction to Physics
- CHEM 1022.03: Engineering Chemistry II
- Writing Class

Year 2 - Term 3 Fall

- ENGM 2021.03: Engineering Mathematics III
- ENGM 2081.03: Computer Programming
- ENGI 2800.03: Engineering Thermodynamics I,6
- ECED 2000.03: Electric Circuits
- ENGI 2200.03: Mechanics of Materials 2,3,4
- Humanities 14,5

Discipline Specific Choices

The following classes replace those noted above where indicated for each specific discipline.

Biological Engineering

1 BIOL 1000.06 Principles of General Biology

Environmental Option

2 BRTH 1040.03 Earth Sciences

Chemical Engineering

3 CHEM 2441.03 Organic Chemistry

Civil Engineering

5 MINE 3500.03 Introduction to Geology for Engineers

6 May substitute CHEM 2441.03 Organic Chemistry OR Accounting

Electrical and Computer Engineering

4 ENGM 2041.03 Applied Linear Algebra and ECED 2200.03 Digital Circuits

Year 2 - Term 4 Winter

- ENGM 2062.03: Engineering Mathematics IV(a)1,5,8,9
- ENGM 2032.03: Applied Probability & Statistics
- ENGI 2300.03: Fluid Mechanics 5,8
- ENGI 2400.03: Mechanics II 3,4,5,8,10
- IENG 2005.03: Engineering Economics 2,4,5,7,8
- CPST 2000.03: Technical Communications 4, 6,9,11

Discipline-Specific Choices

The following classes replace those noted above where indicated for each specific discipline.

Biological Engineering

- 1 BIOL 1000.03 Principles of General Biology
- 2 CHEM 2441.03 Organic Chemistry

Environmental Option:

- 3 IDIS 2000.03 Fundamentals of Environmental Engineering

Chemical Engineering

- 4 CHEE 2404.03 Industrial Chemistry
- CHEE 2420.03 Fundamentals of Chemical Engineering
- IDIS 2000.03 Fundamentals of Environmental Engineering

Electrical and Computer Engineering

- 5 ECED 2900.03 Electrical Engineering Design I
- ENGM 2282.03 Data Structures and Numerical Methods
- ECED 2001.03 Circuit Analysis
- ENGM 2262.03 Engineering Math IV (b)

Computer Option:

- 6 ECED 2400.03 System Analysis

Co-Op Option:

7 Students taking the co-op option do not take IENG 2005.03

Industrial Engineering

- 8 ENGM 2062.03 Engineering Math IV(a) OR ENGM 2262.03 Engineering Math IV (b)
- IENG 2000.03 Modelling and Design of Industrial Systems
- Students must take ENGI 2300.03 Fluid Mechanics OR ENGI 2400.03 Mechanics II

Mechanical Engineering

- 9 MECH 2100.03 Engineering Design and Graphics II AND a Humanities class
- Students taking the co-op option do not take IENG 2005.03

Metallurgical Engineering

- 10 May take MECH 2100.03 Engineering Design and Graphics II

Mining Engineering

- 11 May substitute a Humanities class for CPST 2000.03

Engineering Curriculum for Term 3

Biological	Chemical	Civil	Electrical	Industrial	Mechanical	Metallurgical	Mining
ENGM 2021.03 Engineering Math III	ENGM 2021.03 Engineering Math III	ENGM 2021.03 Engineering Math III	ENGM 2021.03 Engineering Math III	ENGM 2021.03 Engineering Math III	ENGM 2021.03 Engineering Math III	ENGM 2021.03 Engineering Math III	ENGM 2021.03 Engineering Math III
ENGM 2081.03 Computer Programming	ENGM 2081.03 Computer Programming	ENGM 2081.03 Computer Programming	ENGM 2081.03 Computer Programming	ENGM 2081.03 Computer Programming	ENGM 2081.03 Computer Programming	ENGM 2081.03 Computer Programming	ENGM 2081.03 Computer Programming
BIOL 1000.03 Principles of General Biology	ENGI 2800.03 Engineering Thermodynamics	ENGI 2800.03* Engineering Thermodynamics Or CHEM 2441.03 Chemistry Or Accounting	ENGI 2800.03 Engineering Thermodynamics	ENGI 2800.03 Engineering Thermodynamics	ENGI 2800.03 Engineering Thermodynamics	ENGI 2800.03 Engineering Thermodynamics	ENGI 2800.03 Engineering Thermodynamics
ECED 2000.03 Electric Circuits	ECED 2000.03 Electric Circuits	ECED 2000.03 Electric Circuits	ECED 2000.03 Electric Circuits	ECED 2000.03 Electric Circuits	ECED 2000.03 Electric Circuits	ECED 2000.03 Electric Circuits	ECED 2000.03 Electric Circuits
ENGI 2200.03 Mechanics of Materials Environmental Option takes ERTH 1040.03 Earth Sciences	CHEM 2441.03 Organic Chemistry	ENGI 2200.03 Mechanics of Materials	ECED 2200.03 Digital Circuits	ENGI 2200.03 Mechanics of Materials	ENGI 2200.03 Mechanics of Materials	ENGI 2200.03 Mechanics of Materials	ENGI 2200.03 Mechanics of Materials
Humanities	Humanities	MINE 3500.03 Introduction to Geology for Engineers	ENGM 2041.03 Applied Linear Algebra	Humanities	Humanities	Humanities	Humanities

Engineering Curriculum for Term 4

Biological	Chemical	Civil	Electrical	Industrial	Mechanical	Metallurgical	Mining
BIOL 1000.03 Principles of General Biology	ENGM 2062.03 Engineering Math IV (a)	ENGM 2062.03 Engineering Math IV (a)	ENGM 2262.03 Engineering Math IV (b)	ENGM 206.03/2262.03 Engineering Math IV (a/b)	Humanities	ENGM 2062.03 Engineering Math IV (a)	ENGM 2062.03 Engineering Math IV (a)
ENGM 2032.03 Applied Probability & Statistics	ENGM 2032.03 Applied Probability & Statistics	ENGM 2032.03 Applied Probability & Statistics	ENGM 2032.03 Applied Probability & Statistics	ENGM 2032.03 Applied Probability & Statistics	ENGM 2032.03 Applied Probability & Statistics	ENGM 2032.03 Applied Probability & Statistics	ENGM 2032.03 Applied Probability & Statistics
ENGI 2300.03 Fluid Mechanics	ENGI 2300.03 Fluid Mechanics	ENGI 2300.03 Fluid Mechanics	ECED 2900.03 Electrical Engineering Design I	ENGI 2300.03 Fluid Mechanics	ENGI 2300.03 Fluid Mechanics	ENGI 2300.03 Fluid Mechanics	ENGI 2300.03 Fluid Mechanics
CPST 2000.03 Technical Communications	CHEE 2404.03 Industrial Chemistry	CPST 2000.03 Technical Communications	CPST 2000.03 Technical Communications ECED 2400+ System Analysis	CPST 2000.03 Technical Communications	MECH 2100.03 Engineering Design & Graphics II	CPST 2000.03 Technical Communications	CPST 2000.03 Technical Communications Humanities
ENGI 2400.03 Mechanics II Environmental Option takes IDIS 2000.03 Fundamentals of Environmental Engineering	IDIS 2000.03 Fundamentals of Environmental Engineering	ENGI 2400.03 Mechanics II	ENGM 2282.03 Data Structures & Numerical Methods NTB*	ENGI 2400.03 Mechanics II	ENGI 2400.03 Mechanics II	ENGI 2400.03 Mechanics II MECH 2100.03 Engineering Design & Graphics II	ENGI 2400.03 Mechanics II
CHEM 2441.03 Organic Chemistry	CHEE 2420.03 Fundamentals of Chemical Engineering	IENG 2005.03 Engineering Economics	ECED 2001.03 Circuit Analysis IENG 2005.03* Engineering Economics	IENG 2000.03 Modelling & Design of Industrial Systems	IENG 2005.03* Engineering Economics	IENG 2005.03 Engineering Economics	IENG 2005.03 Engineering Economics
			*AU students + Computer Eng.	IENG 2005 Engineering Economics	*Not taken by Co-op students		

VI. Classes Offered

CHEE 2404.03: Industrial Chemistry.

This class reviews chemical knowledge as applied to the industrial chemical process industries, with particular emphasis on Canadian applications. An examination of the relationships between kinetics, thermodynamics, unit operations and process design is made.

FORMAT: Lecture 3 hours, lab 1 hour

EXCLUSION: ChE0704

CHEE 2420.03: Fundamentals of Chemical Engineering.

The main objective of this class is to develop the student's ability to perform mass and energy balances on reactive and non-reactive processes. Introductory topics include systems of units and a study of process variables such as temperature, pressure and flowrate. Also covered are fundamental properties of multiphase systems; phase equilibrium, vapour pressure, phase rule, Raoult's and Henry's Laws, and colligative properties. Emphasis is placed on developing problem solving skills.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ChE0720

ECED 2000.03: Electric Circuits.

This is an introductory class in electric circuit analysis. The material covered starts with a review of the fundamental circuit variables such as voltage, current charge, power and energy. Kirchhoff's laws are introduced and developed into node and mesh analysis techniques. Terminal behaviour and circuit equivalence including Thevenin and Norton circuits are covered. Analysis with controlled sources and energy storage elements is developed including steady state and transient response for first order networks. Phasors and sinusoidal steady state are introduced. Students are introduced to circuit simulation tools such as p-spice.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ENGI 2230.03

ECED 2001.03: Circuit Analysis.

This class covers advanced circuit analysis techniques, starting with sinusoidal excitation. The concepts of phasors and complex impedance are fully developed. Mutual inductance and magnetically coupled coils are used to introduce transformer behaviour and performance. Real and reactive power flow is covered before the introduction of balanced three phase circuits for power distribution. Symmetrical components are introduced as a means of dealing with unbalanced networks. The concepts of grounding and harmonics are also introduced.

FORMAT: Lecture 3 hours, lab 3 hours

ECED 2200.03: Digital Circuits.

This class includes an introduction to: Boolean algebra, encoders, decoders, shift registers, asynchronous and synchronous counters, together with timing considerations. Design of asynchronous circuits, synchronous sequential circuits, and finite state machines, is covered. Karnaugh mapping techniques and state tables and diagrams are taught. Programmable logic is introduced. Contemporary computer aided design and analysis software is used throughout the class.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ENGI 2231.03

ECED 2400.03: System Analysis.

Requirement analysis, specifications, concepts of transforming an ill-defined problem into a set of specifications. Functional decomposition and data dictionaries. Top down structured and object oriented analysis techniques. Laboratory and assignment work will address the analysis of relatively complicated systems using the different techniques.

FORMAT: Lecture 3 hours, lab 2 hours

ECED 2900.03: Electrical Engineering Design I.

This class will cover aspects of design methodology in electrical engineering. Issues addressed include: the engineering design method covering design overview, problem decomposition, solving and planning; decision support techniques, uncertainty and time management; analysis and synthesis for implementation, technical design, design evaluation, prototype construction and evaluation technical design rules, design heuristics, testability, manufacturability, and troubleshooting; project reports, and ethics in design including the employee's dilemma, the value of written records, and reporting problems.

FORMAT: Lecture 2 hours, lab 3 hours

ENGI 1100.03: Engineering Design & Graphics I.

The object of the class is to provide students with conceptual design experience, team work experience, and computer drafting experience; develop the following skills: engineering free-hand sketching, 3-D visualization, and reading of engineering drawings. An integral part of the class is Design Project, focussed on design as the essence of engineering, the process of design and reporting.

FORMAT: Lecture 3 hours, lab 3 hours

ENGI 1400.03: Mechanics I.

Statics teaches the concepts of force, moment, and equilibrium. Topics include a review of the laws of motion, vector algebra, position and force vectors, moments of forces, couple moments, and equilibrium of 2- and 3-dimensional bodies. Structural applications such as 2-dimensional trusses, frames and simple machines, and shear forces and bending moments in beams are presented. Coulomb friction, centroids and centres of mass, and area moments and products of inertia are also included.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ENGI 1120.03

ENGI 2200.03: Mechanics of Materials.

This class is an introduction to the study of stress, strain and deformation of a solid body which is subjected to static forces. Topics considered include: definitions and transformation relations for stresses and strains, principal stresses and strains, Mohr's circle for stress and strain, strain gauges, mechanical properties of materials and failure theories, axial and torsional loading applications, bending of beams with symmetrical cross-section, combined static loading, thin-walled pressure vessels and column action.

PREREQUISITES: MECH 1200.03

EXCLUSION: ENGI 2331.03

ENGI 2300.03: Fluid Mechanics.

This introductory class 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. Incompressible viscous flow through pipes is also presented.

EXCLUSION: ENGI 2341.03

ENGI 2400.03: Mechanics II.

This second class in Engineering Mechanics considers the kinematics and kinetics of a single particle and a single rigid body. The class builds on the concepts introduced in MECH 1200.03 (Mechanics I). Both vector and scalar methods are used. Topics include kinematics of a particle, kinetics of a particle, kinematics of a rigid body in plane motion, and planar kinetics of a rigid body.

FORMAT: Lecture 3 hours, lab/tutorial 3 hours

PREREQUISITES: MECH 1200.03, ENGM 2081.03

EXCLUSION: ENGI 2222.03

ENGI 2800.03 - Engineering Thermodynamics I.

Fundamental definitions and concepts are reviewed. Engineering analysis of properties, heat, work and systems is carried out. The zeroth, first, and second laws are presented. Ideal gases and mixtures, real gases, liquid-vapour relations, availability,

Irreversibility, entropy concepts, and flow in nozzles and diffusers is examined. Gas and vapour power cycles are studied with emphasis on cycle analysis.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ME 3810

ENGM 2021.03 - Engineering Mathematics III.

This class covers first order linear and non-linear differential equations, differential equations of higher order with constant coefficients, applications to Engineering problems, power series solutions, Laplace transforms, periodic functions, applications of Laplace transforms to linear systems, Fourier Series, the line spectrum.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MATH 3110.03 and MATH 3120.03

ENGM 2032.03 - Applied Probability and Statistics.

The topics covered include probability laws and the interpretation of numerical data, probability distributions and probability densities, functions of random variables, joint distributions, characteristic functions, inferences concerning mean and variance, tests of hypotheses, and introduction to linear regression. The class emphasizes engineering applications and makes extensive use of statistical computer packages.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MATH 2060.03 and MATH 2080.03

ENGM 2041.03 - Applied Linear Algebra.

This class covers geometric vectors in three dimensions, dot product, cross product, lines and planes, complex numbers, systems of linear equations, matrix algebra, matrix inverse, determinants, Cramer's rule, introduction to vector spaces, linear independence and bases, rank, linear transformations, orthogonality and applications, Gram-Schmidt algorithm, eigenvalues and eigenvectors.

FORMAT: Lecture 3 hours, lab 2 hours

ENGM 2062.03 - Engineering Mathematics IV(a).

This class covers geometric vectors in three dimensions, dot product, cross product, lines and planes, complex numbers, systems of linear equations, matrix algebra, matrix inverse, rank, determinants, Cramer's rule, space curves, arc length, curvature, functions of several variables, partial derivatives, implicit functions, constrained and unconstrained extrema, multiple integrals, surface area and volume, scalar and vector fields, line integrals, gradient, divergence and curl.

FORMAT: Lecture 4 hours, lab 1 hour

EXCLUSION: MATH 2480.03 and MATH 2490.03

ENGM 2081.03 - Computer Programming.

This class covers fundamental programming principles including flow control, modularity, and structured programming. The student will implement significant programs in the C language to solve engineering problems.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ENGI 2240.03

ENGM 2262.03 - Engineering Mathematics IV(b).

This class covers space curves, arclength, curvature, functions of several variables, partial derivatives, implicit functions, constrained and unconstrained extrema, multiple integrals, line, surface, and volume integrals, change of variables in multiple integrals, scalar and vector fields, gradient, divergence and curl, Stokes Theorem, the Divergence Theorem, and applications to heat flow, electrostatics and fluid flow.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MATH 2480.03 and MATH 2490.03

ENGM 2282.03 - Data Structures & Numerical Methods.

This class introduces the student to system analysis, and software techniques. Topics covered include objects, stacks, queues, multiple linked lists, searching and sorting algorithms, and their

implementation in the C++ programming language. The students use linear algebra and numerical methods in engineering examples while learning to implement properly structured solutions.

FORMAT: Lecture 3 hours, lab 2 hours

IDIS 2000.03: Fundamentals of Environmental Engineering.

The class will focus on sources of environmental pollutants, the effects of pollutants on living and non-living systems, and the processes by which pollutants are generated or by which their effects can be minimized or remediated. Lectures are supplemented by tutorials which include guest speakers, case studies and field trips.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ID0066

IENG 2000.03 - Modelling & Design of Industrial Systems.

This class is an introduction to the concepts and methods of Industrial Engineering. Beginning with fundamental ideas of Taylor, Gantt and the Gilbreths, the role of IEs as system engineers is emphasized up to and including design of the modern computer integrated systems of today. System models provide a context within which to measure productivity and to design improved systems. This class introduces methods of work design, ergonomics, facilities design, materials handling, scheduling, production planning, inventory control and quality control that are widely used by Industrial Engineers.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: IE0711

IENG 2005.03 - Engineering Economics.

This class deals with the ergonomics of Engineering Design. After introducing fundamental concepts and cash flow diagrams, interest factors are dealt with in some detail. A variety of discounted cash flow techniques are covered including rate of return calculations. Inflation, tax, replacement and risk are also amongst the topics considered.

FORMAT: Lecture 3 hours, lab 1 hour

EXCLUSION: IE0718

MECH 2100.03 - Engineering Design & Graphics II.

This class provides a project-based exercise in the engineering design process. Students work in teams and as individuals on defined projects which utilize knowledge and skills in graphics, statics, computing, and mechanics of materials. The projects encompass conceptual design, detailed analysis, engineering drawings, experimentation, physical model fabrication, laboratory testing, and preparation of professional reports.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ENGI 2101

CP Series: Complementary Studies Classes

CPST 2000.03: Technical Communications.

The class deals with several aspects of professional activity including the preparation of technical memos, letters and reports. Topics include professional associations, the relationship of engineers to society and the subject of engineering societies and their work in publications, codes and standards. Guest lecturers are invited to participate in discussions. Throughout the class students practice their writing skills by submitting assignments which are marked for clarity, style and presentation as well as for proper English.

EXCLUSION: ME3210

CPST 2010.03: History of Engineering.

Engineering from early times through the Middle Ages up to the present. Development of structures, mechanics, and other engineering works as well as processes, devices and methods of analysis and design. The classes will consist of three parts. The first is a broad, overall view of the profession, the second portion deals

with a brief look at various major areas. Finally the student will devote some time to an in-depth study of some particular area of interest to her or him, under the guidance of a staff member in her or his department.

FORMAT: Lecture 3 hours

EXCLUSION: CP0010

CPST 2013.03: Technology, Science and Society.

This class attempts to explain what happened in history in terms of the rise and advance of technology and the birth and progress of science, instead of traditionally in terms of politics and economics. It is not a history of technology, nor a history of science; such histories are numerous. In this class the focus is on society. The class examines those rare historical periods in which the social, economic and political arrangements were highly productive of technology and science, seeking to discover - using the judgment and wisdom of the best scholars - how and why this was so. What, for example, is the origin of the scientific revolution of the seventeenth century? On the other hand, the class examines equally how technology and science, once they arrive in a society, alter, even revolutionize, the former economic and political arrangements, and produce a new climate of opinion.

The class is in the form of lectures but ample time will be available for questions and discussions.

FORMAT: Lecture 3 hours

EXCLUSION: CP0013

CPST 2017.03: Applied Psychology.

A class dealing with human behaviour as it affects each one personally and his or her dealings with people he or she comes in contact with. The class will attempt to discuss, in simplified terms, general concepts of human behaviour held today, factors which enter into the development of stable personality, the common ways in which behaviour is distorted by emotional forces, and simplified concepts regarding the possibilities of influencing human behaviour. Particular attention will be paid to behavioral problems which occur in industry, job placement, vocational guidance, accidents, fatigue, morale, leadership and supervision.

FORMAT: Lecture 3 hours

EXCLUSION: CP0017

CPST 2019.03: Technical Literature.

The class in technical literature deals with the preparation of scientific and technical reports of all types. It gives a comprehensive description of sources of published material in all fields of engineering and in architecture and describes the methods of dealing with these sources, including a discussion of modern methods of information retrieval. It explains the arrangement of typical technical reports and discusses problems of style and presentation. Written assignments are a major part of the class. Students are expected to write clearly and correctly and to be able to understand and employ efficiently the correct techniques of literature searching and of bibliographic methods. Retrieval problems involving a computer are demonstrated.

FORMAT: Lecture 3 hours

EXCLUSION: CP0019

CPST 2023.03: Engineering Law and Contracts.

The class is designed to introduce the student to the subject of law in its relation to the practice of engineering. Consideration is given to the promotion, organization and financing of engineering affairs, through the legal entities of partnership and companies. The sources and operation of law are considered with particular reference to engineering contracts and the practice of Professional Engineering Contracts.

FORMAT: Lecture 3 hours

EXCLUSION: CP0023

CPST 2028.03: Ecology.

The class is designed to provide architecture and engineering students with a background in ecological theory. Community structure, energy and materials flows, population dynamics and man's impact on the environment are considered in some detail. Special topics such as aquatic and urban ecosystems are also

analyzed. The first hour of each class period is devoted to lectures, the second hour consists of a discussion session in which students are encouraged to use their expertise as engineers or architects in examining controversial environmental issues.

FORMAT: Lecture 3 hours

EXCLUSION: CP0028

CPST 2029.03: Economics.

The class explores the economic approach to human behaviour. Sex, affection, divorce, law, crime, cheating, learning and grading are among the topics discussed. No previous knowledge of economics is required.

FORMAT: Lecture 3 hours

EXCLUSION: CP0029

CPST 2030.03: Architecture and Building Science.

Exploration of a selected range of issues that influence building design and of recent developments in their study by architects, engineers, social scientists and others. Consideration of the manner in which requirements and knowledge have been synthesized in certain local buildings. Issues to be considered include: the building evaluation process; user-requirements and design criteria; personal and social requirements of responses to buildings; building economics; the quality of the physical environment within buildings; choice of structure and materials; durability and workmanship; spatial organization and building form; the effect of tradition; industrialization and rationalization; synthesis and the design process.

FORMAT: Lecture 3 hours

EXCLUSION: CP0030

CPST 2033.03: Professions and Professionals.

This class will examine the nature of professions with particular emphasis on the problems and paradoxes confronting professional engineers and architects today. It is designed to give students a greater knowledge and awareness of the changes occurring in professional organizations and professional practice. Emphasis is placed on the interplay of political forces, economic interests, professional ambition, organizational structure and professional ethics in engineering and architectural practice. The case study method is used to present "real life" situations for class discussion.

FORMAT: Lecture 3 hours

EXCLUSION: CP0033

CPST 2034.03: Technology and Art.

The aim of the class is to explore the interface between technology and art. The skills being acquired in the Faculties of Engineering and Architecture will be applied to the creation of projects using available media and methods: e.g., sound, light, electrical, mechanical, structural, computers. The class will include lectures, studio instruction, and project discussions.

FORMAT: Lecture 3 hours

EXCLUSION: CP0034

CPST 2035.03: The Engineering Profession.

This class will examine the practical aspects of the engineering profession with particular emphasis on ethical behaviour, duties of engineers and professional organizations. Case studies are used to promote class discussion and students are given ample opportunity to practice their presentation skills. Students are introduced to changes occurring in the engineering profession and to considerations such as whistleblowing, political interests, economic influences, women in engineering, engineers in the decision making process and codes of ethics of other professions.

FORMAT: Lecture 3 hours

EXCLUSION: CP0035

CPST 2036.03: Effluents and Environment.

Current environmental issues are examined in relation to ecology, engineering and economics. Students will be expected to take an active role in determining the subjects discussed in lectures, informal seminars and papers. Although the specific class content

may change each year, general subjects such as waste disposal, alternative energy sources, human population growth and land use planning will be considered.

FORMAT: Lecture 3 hours

EXCLUSION: CP0036

CPST 2038.03: Corporate and Industrial Relations.

The class is designed to introduce the student to relationships in industry. The student is first made aware of how companies and other industrial organizations philosophize, communicate and conduct themselves. Entrepreneurship is then studied to show another side of corporate relationships. Industrial relations are discussed with emphasis on realistic situations in contrast to classical theories. Finally, new concepts of productivity improvement and emerging issues in labour relations are discussed. A sizeable portion of each lecture session is dedicated to discussion of industrial situations. Prominent leaders in government, business and labour are brought in at pertinent points as guest speakers.

FORMAT: Lecture 3 hours

EXCLUSION: CP0038

CPST 2039.03: Humans and the Environment.

This class examines the role of humans in the biosphere by following the biological and technical evolution of humans over the past two million years. Lectures and discussion will concentrate on the ability of humans to make and use the tools and the way in which our role has changed from being totally dependent on the environment to being an environmental manager. Particular attention will be paid to the interactions of technology and various terrestrial and aquatic ecosystems.

FORMAT: Lecture 3 hours

EXCLUSION: CP0039

CPST 2040.03: Small Scale Water Supply and Sanitation Systems.

This class deals with the design and implementation of water supply and sanitation facilities in areas which cannot support large-scale, centralized distribution or collection systems. The primary focus is on techniques which are appropriate to the physical and social settings in which they will be used. The class is appropriate for students in all branches of engineering and will be of particular interest to students who plan to work in areas outside of major urban centers, in less developed countries, or in the public health field.

FORMAT: Lecture 3 hours

EXCLUSION: CP0040

CPST 2041.03: Communication Skills.

This class aims to develop verbal and written communication skills required for professional activity. Attention will be given to both explanation and persuasion. Assigned work will include verbal presentations, a variety of written communications and constructive criticisms of communications from other students. The evaluation of sample material, guest lectures and audio and video feedback may be utilized.

FORMAT: Lecture 3 hours

EXCLUSION: CP0041

CPST 2042.03: Managing Technological Innovation.

The technological innovation process is the term used to describe the conversion of a technical invention into a successful new product. The class examines this process in technology based on companies, in Canada and abroad, considering the management and entrepreneurial factors involved. It thereby introduces students to some major aspects of business and implicitly identifies alternative paths for those who may, in the future, seek to pursue management careers based upon their engineering backgrounds.

FORMAT: Lecture 3 hours

EXCLUSION: CP0042

CPST 2043.03: Small Business Management and Entrepreneurship.

The class is designed to provide engineers with the information and skills necessary to initiate and/or manage a small business. An emphasis will be placed on the necessary steps in planning, operating and evaluating a small business concern in Canada. The essential steps in developing a business plan will be covered, including financing, marketing, business organization and management. Actual case studies will provide students with a practical insight to business management and entrepreneurship.

FORMAT: Lecture 3 hours

EXCLUSION: CP0043

CPST 2045.03: Quality Management.

The class will expose the student to essential concepts and elements which surround most quality improvement initiatives. The topics covered will include: a definition of quality, quality philosophies of Demming, Muran and Crosby, the principles of quality management, organization behaviour, the costs and economics of quality, quality improvement tools and techniques, and quality systems and standards such as ISO9000.

FORMAT: Lecture 3 hours

EXCLUSION: CP0045

CPST 2053.03: Development of Technology.

This class comprises a series of seminars and essays covering the technological and scientific development of the human race. It is designed primarily as a study of the contributions made by selected scientists and engineers, and of the impact of their discoveries on the society of their times. An additional objective is to improve oral and written skills. Students make at least three presentations to the class on either a person or a topic taken from (1) ancient civilization, (b) the industrial revolution and (c) modern times. In addition, students write an extended essay on one of the selected seminar topics. These essays are evaluated for style as well as content, and the findings are discussed with each student.

FORMAT: Lecture 3 hours

EXCLUSION: CP0053

ID Series: Interdisciplinary Classes

IDEG 2066.03: Fundamentals of Environmental Engineering.

The class focuses on sources of environmental pollutants, the effect of pollutants on living and non-living systems, the processes by which pollutants are generated, and the processes by which their effects can be minimized or remediated. The topics include environmental science, air pollution, land based pollution and water pollution. Case studies and field trips are an integral part of the class.

EXCLUSION: ID0066

Biological Engineering

Dean

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Stratton, G.W., BSc, MSc, PhD (Guelph)

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Special Lecturer

Patterson, R.N., BSc (RMC), BSc (Tor), MASC (TUNS)

I. Introduction

Biological Engineering occupies a unique position in the engineering professions in applying the principles of engineering to the biological world. Biological Engineers are involved in many areas in which the principles of engineering are applied to bio-systems, such as: aquaculture, environment, food and biotechnology.

There are two options available in the Department of Biological Engineering:

1. Biosystems Engineering; and
2. Environmental Engineering

The curriculum in Biosystems Engineering is tailored to providing an education across many fields of engineering and their application to the biotechnology and the agri-food industries. As a result, co-op students and graduates are to be found in a very wide range of professional jobs in both the public and private sectors. In the public sector, Biosystems Engineers are employed in the federal and provincial departments of agriculture and food, fisheries and environment. In the private sector, Biosystems Engineers are to be found in consulting, machinery manufacturing, and food processing in all levels of design and management and in other diverse industries where their breadth of training is required.

Environmental engineering covers a wide range of topics, such as surface and groundwater pollution, air pollution, and indoor air quality, energy and the environment, waste management, soil contamination, erosion, etc. Thus the curriculum of the

Environmental Engineering Option has been structured to allow students to select from all the environmental engineering classes offered in the various departments at DalTech.

Environmental engineers are employed in consulting, government and research institutions. During co-op work terms and following graduation, jobs include the design and application of equipment to prevent and remedy soil, water and air pollution, to manage wastes and to measure, monitor and control pollutants; and in the service sector that is actively involved in environmental assessment and control, consulting, waste management, environmental research, and natural resource conservation and protection.

The entrance requirement to the Biosystems Engineering and the Environmental Engineering options is a successful completion of the first year engineering at a recognized university. Students who have completed a first year of a science programme that included a full class of biology will also be considered for admission into Year II of the programme. Students who have completed two or more years of university studies will be considered for admission on the basis of transfer of credits.

The Department has an active research programme and opportunities exist for graduate studies leading to the MEng, MASC and PhD degrees.

II. Co-operative Programmes

The two options in our programme enable students to participate in a work/study Co-operative programme. This allows students to work for three terms under the guidance and supervision of practicing engineers, thereby acquiring skills that are complementary to their academic training. Such professional training programmes have been well received and supported by industry and government agencies.

A. Work Terms

The University solicits appropriate positions in industry and government. Students compete for positions of their preference by submitting resumes and attending interviews. The employer's preferences and the student's preferences are matched wherever possible. Students should be prepared to work anywhere in Canada.

The University endeavours, but makes no commitment to find a position for every student. A student is at liberty to arrange his or her own employment, but in order to qualify as part of the Co-op work experience, the position must be approved by the Department. Each work term will be evaluated and academic credit will be granted on the condition that satisfactory evaluations of the various components of the work term are achieved.

Students who have successfully completed the requirements for the degree of Bachelor of Engineering and who, in addition, have accumulated 1400 or more hours of approved work experience, will receive the "Co-op Programme" designation on their degree.

B. Co-op Schedule

The following table shows the layout of study and Co-op (work) terms:

Yr/Term	Fall	Winter	Summer
Year 1	AT1	AT2	FREE
Year 2	AT3	AT5	FREE*
Year 3	AT5	AT8	Work
Year 4	AT7/Work	AT8/Work	Work
Year 5	AT7/Work	AT8/Work	

* Students are advised to seek employment for Term 6 and consult with the department for approval as work term experience, before work commencement.

C. Biosystems Engineering Co-op Programme

As can be seen from the syllabus of classes noted below, students in the Biosystems Engineering option can choose one of the following four emphases: Agricultural Engineering, Aquacultural

Engineering, Biomachines and Robotics, or Food and Bioprocess Engineering. As indicated in the syllabus, the Agricultural and Aquacultural Engineering emphases are given in conjunction with the Nova Scotia Agricultural College (NSAC), in Truro, NS. This gives greater breadth of training in Agriculture and Aquaculture and allows the students to benefit from the expertise and specialized equipment at the Nova Scotia Agricultural College.

Year 1 follows the common programme outlined in the Engineering section of this calendar.

Year 2 - Term 3 (Fall)

- BIOL 1000.06 Principles of General Biology
- ECED-2000.03 Electric Circuits
- ENGM 2021.03 Engineering Mathematics III (Differential Equations)
- ENGM 2081.03 Computer Programming
- ENGI 2200.03 Mechanics of Materials
- Humanities

Year 2 - Term 4 (Winter)

- BIOL 1000.06 Principles of General Biology
- CHEM 2441.03 Organic Chemistry
- ENGM 2032.03 Applied Probability & Statistics
- ENGI 2300.03 Fluid Mechanics
- ENGI 2400.03 Mechanics II
- CPST 2000.03 Technical Communications

Year 3 - Term 5 (Fall)

- ENGM 33561.03 Engineering Mathematics IVc (Vector Calculus & PDE)
- BIOE 3211.03 Microbiology of Natural Systems
- BIOE 3221.03 Applied Thermodynamics
- BIOE 3231.03 System Optimization
- BIOE 3241.03 Industrial Biotechnology
- IDIS 2000.03 Fundamentals of Environmental Engineering

Year 3 - Term 6 (Winter)

- ENGM 3352.03 Linear Algebra and Numerical Methods
- BIOE 3252.03 Heat & Mass Transfer
- BIOE 3312.03 Measurement & Control
- BIOE 3322.03 Properties of Biomaterials
- MECH 4330.03 Mechanical Design
- CPST 2023.03 Engineering Profession and Law

Year 4/5 - Terms 7 & 8

- BIOE4301.03 Design Project for Biosystems Engineers I
- BIOE4302.03 Design Project for Biosystem Engineers II
- IENG2005.03 Engineering Economics
- Technical Elective 1
- Technical Elective 2
- Technical Elective 3
- Technical Elective 4
- 4 emphasis classes(see below)

Agricultural Engineering Emphasis

(One term at Nova Scotia Agricultural College)

- BIOE4101.03 Introduction to Soil Science
- And three of:
- BIOE4111.03 Structures and their Environment
- BIOE4121.03 Materials Handling and Processing
- BIOE4131.03 Drainage and Irrigation
- BIOE4141.03 Principles of Agricultural Machinery

Aquacultural Engineering Emphasis

(One term at Nova Scotia Agricultural College)

- BIOE4322.03 Aquacultural Engineering at Sexton Campus
- BIOE4151.03 Aquatic Environment
- BIOE4161.03 Aquatic Engineering
- BIOE4171.03 Physiology of Aquatic Animals

Biomachines and Robotics Emphasis

- BIOE4011.03 Robotics
- BIOE4312.03 Microcomputer Interfacing
- BIOE4331.03 Design of Biomachines
- IENG4573.03 Industrial Biomechanics or Technical Elective

Food and Bioprocess Emphasis

- BIOE 4341.03 Food Science for Engineers
- BIOE 4351.03 Bioprocess Engineering
- BIOE 4352.03 Food Engineering
- BIOE 4312.03 Microcomputer Interfacing

Biosystems Engineering Option - Recommended Technical Electives

- BIOE 3422.03 Soil and Water Conservation
- BIOE 3432.03 Waste Management
- BIOE 4110.03 Water and Water Quality Management @ NSAC
- BIOE 4312.03 Microcomputer Interfacing
- BIOE 4322.03 Aquacultural Engineering
- BIOE 4325.03 Farm Power
- BIOE 4330.03 Thermal Environmental Control
- BIOE 4331.03 Design of Biomachines
- BIOE 4651.03 Solar Energy Utilization
- CHEE 4632.03 Kinetics
- CHEE 5734.03 Chemical Reactor Design
- CIVL 4150.03 Soils and Foundations
- IENG 3338.03 Ergonomic and Safety Engineering
- IENG 3445.03 Facilities Design
- MECH 4340.03 Engineering Applications of Plastics
- MECH 4631.03 CAD/CAM
- MECH 4650.03 Biomechanical Engineering

NOTE: *Technical classes from other departments may be selected subject to availability and the approval by the departments concerned.

*Technical electives in any one year will depend on demand and staff availability.

D. Environmental Engineering Co-op Programme

During their senior year, Environmental Engineering students can specialize in one or more of the following areas: Air Pollution Control, Energy and the Environment, Soil and Water Quality and Management, and Waste Utilization and Management.

Year 2 - Term 3 (Fall)

- BIOL 1000.06 Principles of General Biology
- ECED 2000.03 Electric Circuits
- ENGM 2021.03 Engineering Mathematics III (Differential Equations)
- ENGM 2081.03 Computer Programming
- EARTH 1040.03 Earth and Society (Earth Science)
- Humanities

Year 2 - Term 4 (Winter)

- BIOL 1000.03 Principles of General Biology
- CHEM 2441.03 Organic Chemistry
- ENGM 2032.03 Applied Probability & Statistics
- ENGI 2300.03 Fluid Mechanics
- IDIS 2000.03 Fundamentals of Environmental Engineering
- CPST 2000.03 Technical Communications

Year 3 - Term 5 (Fall)

- ENGM 3361.03 Engineering Mathematics IVc (Vector Calculus & PDE)
- BIOE 3211.03 Microbiology of Natural Systems
- BIOE 3221.03 Applied Thermodynamics
- BIOE 3231.03 System Optimization
- BIOE 3241.03 Industrial Biotechnology
- CHEE 4772.03 Environmental Assessment and Management

Year 3 - Term 6 (Winter)

- ENGM 3352.03 Linear Algebra and Numerical Methods
- BIOE 3252.03 Heat & Mass Transfer
- BIOE 3412.03 Energy and Environment
- BIOE 3422.03 Soil and Water Conservation
- BIOE 3432.03 Waste Management
- CPST 2023.03 Engineering Profession and Law

Year 5 - Terms 7 & 8

- BIOE 4401.03 Design Project for Environmental Engineers I
- BIOE 4402.03 Design Project for Environmental Engineers II
- IENG 2005.03 Engineering Economics
- 8 Technical Electives Classes

Environmental Engineering Option - Recommended Technical Electives

- BIOE 4110.03 Water and Water Quality Management @ NSAC
- BIOE 4612.03 Waste Disposal and Utilization
- BIOE 4641.03 Environmental Control and Indoor Air Quality
- BIOE 4651.03 Solar Energy Utilization
- BIOE 4322.03 Aquacultural Engineering
- BIOE 3312.03 Measurement and Control
- BIOE 4312.03 Microcomputer Interfacing
- BIOE 6010.03 Soil Erosion
- BIOE 6240.03 Biomass Energy
- CHEE 4872.03 Air Pollution Control
- CIVL 4150.03 Soils and Foundations
- CIVL 4440.03 Water and Wastewater Treatment
- CIVL 4420.03 Geo-environmental Engineering
- IENG 4574.03 Decision and Risk Analysis
- MINE 5818.03 Mine Waste Management

NOTE:*Technical classes from other departments may be selected subject to availability and the approval by the departments concerned.

*Technical electives in any one year will depend on demand and staff availability.

III. Classes Offered

BIOE 3211.03: Microbiology of Natural Systems.

The principles of microbial communities are applied to biological systems. Emphasis is placed on microbial populations in air, soil and water. Further investigation includes microorganisms found in food, aquaculture and mining industries. Applications of microbial ecology to agriculture, industry, biotechnology and environment are examined.

FORMAT: Lecture 3 hours, lab 3 hours

PREQUISITE: BIOL 1000.06 or equivalent

BIOE 3221.03: Applied Thermodynamics.

The objective of this class is to introduce fundamental concepts and engineering applications of thermodynamics relevant to biological systems. Topics covered include the first and second laws of thermodynamics, entropy, availability, psychrometrics, chemical reactions and phase equilibrium.

FORMAT: Lecture 3 hours, lab 2 hours

PREQUISITES: One class (3 credits) in differential and integral calculus and general chemistry

BIOE3231.03: System Optimization.

An introduction to methods used to consider complete production systems and the alternatives with a view to optimizing managerial decisions is presented. Particular systems analysis methods include capacitated flow networks, Lagrangian multipliers, linear programming, decision analysis, queuing theory, critical path method, and application of Boolean algebra to equipment selection. Practical examples emphasize environmental safety and risk.

FORMAT: Lecture 2 hours, lab 2 hours

EXCLUSION: AE1300

PREQUISITE: A class in statistics

BIOE 3241.03: Industrial Biotechnology.

The objective of this class is to introduce principles of biochemistry, biochemical engineering and industrial and environmental applications of microbiology of interest to engineers. Topics covered include chemistry of biological molecules, microbial stoichiometry and energetics, coordination of microbial activity, enzyme and microbial kinetics, and applied microbiology topics such as production of microbial biomass, aerobic and anaerobic fermentation; and bioremediation.

FORMAT: Lecture 3 hours, lab 3 hours

PREQUISITE: BIOE 3211 or equivalent and CHEM 2241.03

BIOE 3252.03: Heat and Mass Transfer.

The objective of the class is to introduce the fundamentals of heat and mass transfer of relevance to biosystems and environmental engineering. Topics covered include: steady state conduction in one dimension, conduction in multi-dimensions, unsteady state conditions, convective heat transfer (forced and natural), molecular mass diffusion and convective mass transfer. Radiative heat transfer and transport processes in the atmosphere are also introduced.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: AE1011/AE1310

PREQUISITES: ENGI 2300.03, ENGM 2021.03 and one class in Thermodynamics

BIOE 3312.03: Measurement and Control.

The objectives of this class are to cover the principles of instrumentation and to introduce the subject of automatic controls. Instrumentation terminology and fundamentals of experimental data analysis are emphasized in lectures and laboratory exercises. Measurement of variables such as pressure, flow, temperature, humidity, displacement, force and acceleration are discussed. Automatic controls are introduced from an applied point of view. Control topics covered include, on-off control using using programmable logic controllers and proportional -integral-derivative control.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: AE0804/AE1100

PREQUISITES: ECED 2000.03

BIOE 3322.03: Properties of Biomaterials.

This class provides a knowledge of biomaterial properties required for the design and analysis of biological machines, process equipment and product quality. Laboratories focus on physical properties of biomaterials. Topics include statistical methods in food quality management; physical characteristics, including shape and size; mechanical properties including rheology and texture; water and its role in storage stability; thermal properties; electrical properties; and optical properties.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: AE0750

BIOE 3412.03: Energy and Environment.

This class deals with energy sources and consumption in various systems. Energy conservation and utilization of renewable energy sources are emphasized. Environmental impacts of energy development and consumption are examined. To acquire self study skills and develop oral and written communication skills, each student will undertake a term project in which the environmental impact of energy utilization and/or conservation in a particular system is examined. Students are expected to carry out a literature search on the subject. A written and an oral presentation are required.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: AE0806

BIOE 3422.03: Soil and Water Conservation.

The prediction, nature, effects and control of natural surface and sub-surface waters and non-point source pollutants in catchments are considered. Design flood hydrograph, flood routing, porous media flow and soil erosion prediction techniques are presented. Energy dissipating structures used to control flood flows which are discussed include terraces, chutes, drop inlets, grassed waterways, culverts and small earth dams. An earth dam design project extends over the class duration.

FORMAT: Lecture 4 hours, lab 2 hours

EXCLUSION: AE1021/AE1320

PREQUISITE: ENGI 2300.03

BIOE 3432.03: Waste Management.

This class deals with sources of pollution and their effects on air, water, and soil qualities. The physical, chemical and biological treatment processes of various types of waste are discussed in relation to pollution control. Physical, chemical and microbiological analyses of various types of wastes are done in the laboratory periods. This class includes a term project, field trips, and seminars.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: AE0841

BIOE 3805.03: Electric Circuits and Electronics.

This class covers the fundamentals of electric circuits and electronics to provide the background necessary for a subsequent class in instrumentation and control. The theory of DC and AC circuits is treated in detail. Fundamental principles of analog and digital electronics are also presented. Basic circuit components and devices are examined. Laboratories are an integral part of the class.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: AE0805

BIOE 4011.03: Robotics.

See class description for MECH 4640.03 in the Mechanical Engineering section of this calendar.

BIOE 4101.03: Introduction to Soil Science.

General principles of soil science relating to the origin, development, and classification of soils; the biological, physical, and chemical properties of soils and their relation to proper soil and crop management, land use, and soil conservation.

FORMAT: Lecture 3 hours, lab 4 hours

BIOE 4110.03: Water and Water Quality Management.

Principles of soil and water management including control of the plant-soil-water environment, monitoring and evaluation of principles and structures applied to irrigation and drainage, and methods of controlling non-point source pollution in agriculture are discussed. Water table management models and their evaluations for Atlantic Canada conditions are also discussed.

FORMAT: Lecture 3 hours, lab 3 hours

BIOE 4111.03: Structures and their Environment.

The objectives of this class are to provide information on planning farm buildings to save labour, to provide conditions for improved productivity of livestock, to maintain the quality of stored crops and to protect machinery. The building materials, functional layouts and electrical requirements are presented for different types of buildings. Planning of the farmstead is discussed. Environmental physiology of domestic animals is also covered.

FORMAT: Lecture 3 hours, lab 3 hours

BIOE 4121.03: Materials Handling and Processing.

This class covers the basic unit operations involved in on-farm processing. Each process studied is described mathematically and discussed in relation to quantities, rates, and energy requirements. Laboratories on each unit operation serve to increase the students' understanding of the basic principles involved. Topics covered include: electric motors, fluid transport (pumps), drying (with emphasis on grain drying), material transport (screw conveyors, bucket elevators, belt conveyors, pneumatic conveyors) and refrigeration.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: AE1050

BIOE 4131.03: Drainage and Irrigation.

This class emphasizes the design of drainage and irrigation systems. Introductory material includes basic hydrology, soil-water-crop relationships and an overview of the theory of confined, unconfined and unsaturated flow of water in soil. Drainage design includes the planning and selection of the most appropriate system and detailed consideration of the design and implementation of surface and subsurface systems. Irrigation design emphasizes supplemental irrigation and includes: crop requirements; water supply and conveyance; and surface, sprinkler, and drip applications.

FORMAT: Lecture 3 hours, lab 4 hours

EXCLUSION: AE1020

BIOE:4141.03: Principles of Agricultural Machinery.

The objectives of this class are: to provide a basic knowledge of the components, functional requirements and principles of operation of agricultural machines; to apply the knowledge of machine design theory to farm machinery; and to introduce optimal selection of farm machinery. Machinery applications include: tillage, crop planting, crop cultivation, forage chopping and handling, and grain and seed harvesting. This class also includes testing and evaluation of the performance of field machinery and a systematic design of a piece of agricultural machinery.

FORMAT: Lecture 3 hours, lab 3 hours

BIOE 4151.03: Aquatic Environment.

Engineering principles are studied in context of requirements for environmental management of intensive aquaculture of finfish, molluscs, crustaceans, and marine plants of commercial importance. Topics in water habitat management will be emphasized including: water properties in both fresh and salt water systems, water quality and water purification, fluid dynamics and statics, and control of the aquatic environment.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: AE1493

CROSS-LISTING: AE215 at NSAC

BIOE 4161.03: Aquatic Engineering.

Support facilities, equipment and systems for aquaculture operations will be examined. Topics studied will include: selection of component materials and structures suitable for confinement, protection, and support of aquaculture species; selection and application of mechanical/electrical support equipment such as pumps, motors, feeders, aerators, water heating systems, waste management systems and monitoring equipment; and engineering aspects of facilities for harvesting, handling, processing, packaging, and preservation of aquatic production.

FORMAT: Lecture 3 hours, lab 3 hours

BIOE 4171.03: Physiology of Aquatic Animals.

The form, function, physiological integration, and behaviour of major types of aquatic animals are considered. Emphasis is placed on classes of organisms, using commercially important species as primary examples.

FORMAT: Lecture 3 hours, lab 3 hours

BIOE 4181.03: Introduction to Aquaculture.

The history and current status of world aquaculture production is discussed, with emphasis on species with potential in Atlantic Canada. Advances in fresh water or marine fish culture are considered. The class includes field trips to fish hatcheries, commercial mollusc production units, fish processing facilities, and other industrial facilities. A review of aquatic resource regulations is included.

BIOE 4191.03: Cell Biology.

An introduction to cell biology. Topics include cell metabolism, the structure and function of organelles of the eucaryotic cell, cell growth, cell movement, and the procaryotic cell. Specialized cell functions are also discussed.

BIOE 4301.03: Design Project for Biosystems Engineers I.

The objective of the class is to provide students with first hand experience in applying engineering design principles and practices to solve specific problems in the biological world. Students are expected to display a high level of initiative and ingenuity in carrying the project through its various design stages.

FORMAT: Lecture 1 hour, lab 5 hours
EXCLUSION: AE1480

BIOE 4302.03: Design Project for Biosystems Engineers II.

This is a continuation of BIOE4301 leading to a final presentation in both oral and written format.

FORMAT: Lecture 1 hour, lab 5 hours
EXCLUSION: AE1480

BIOE 4312.03: Microcomputer Interfacing.

This class integrates instrumentation, control and microcomputers to illustrate the formulation and utilization of measurement and control systems. The concept of discrete signals is discussed and the components of a microprocessor based system are presented. Input/output techniques are covered in terms of the interfacing of measurement and control hardware to the microcomputers. Topics covered include analog to digital conversion, digital to analog conversion and digital proportional-integral-derivative control.

FORMAT: Lecture 3 hours, lab 3 hours
EXCLUSION: AE1495

BIOE 4322.03: Aquacultural Engineering.

The general types of aquacultural engineering systems are discussed along with the main species of finfish, molluscs, crustaceans and algae currently cultivated in Canada. Controlling the characteristics of fresh and saline water is examined. Site selection and land impoundments are discussed. The design of marine systems, feeding systems and harvesting systems is developed. A project design is carried out by all students. Field trips are an integral part of the class.

FORMAT: Lecture 3 hours, lab 3 hours

BIOE 4325.03: Farm Power.

The objective of this class is to provide a basic knowledge of the generation of mechanical energy utilized on the farm, with special reference to the farm tractor. Topics covered include: internal combustion cycles, tractor engine design, engine accessories, electrical systems, fuels and lubricants, tractor chassis, power transmission systems, ground drive systems, slip and theory of traction, tractor stability, hydraulic systems, and tractor power costs.

FORMAT: Lecture 3 hours, lab 3 hours
EXCLUSION: AE1270

BIOE 4330.03: Thermal Environmental Control.

The class deals with the design of heating, ventilating, air conditioning and lighting systems for controlled environments such as plant and animal production units and modified atmosphere storages. Topics covered include: animal shelters, greenhouses, horticultural crop storages and rural housing. Methods of energy

conservation and recovery are discussed in relation to current methods of energy conversion in buildings. Completion of an assigned term project is a part of this class.

FORMAT: Lecture 3 hours, lab 3 hours

PREQUISITE: BIOE 3252.03 or equivalent

BIOE 4331.03: Design of Biomachines.

This class extends the design and analysis of machines to components such as belts, gearing, wire ropes, clutches and brakes. Reference is made to appropriate design codes. The Finite Element Methods is introduced for analysis of the machine frame. Design examples are from agricultural, aquacultural, biomedical, fisheries and food engineering fields to demonstrate their special requirements. Detailed design of a machine will be part of the class.

FORMAT: Lecture 3 hours, lab 2 hours
PREQUISITE: MECH 4330.03

BIOE 4341.03: Food Science for Engineers.

This class introduces the fundamental chemical, nutritional and microbiological aspects of food processing. Emphasis is placed on food quality, deterioration and principles of its preservation. Topics covered include: constituents of food (properties, significance, and nutritive aspects); factors related to quality and deterioration; fats and oils; food additives; and the requirements for food preservation, packaging and storage.

FORMAT: Lecture 2 hours, lab 3 hours
EXCLUSION: AE0760

BIOE 4351.03: Bioprocess Engineering.

This class focuses on the process design of unit operations involved in bioprocessing. Topics include fluid flow and mixing, transport phenomena in bioprocess systems, design and analysis of biological reactors, and bioseparation processes. Examples encompass various areas of bioprocessing. Simulation of a bioprocess is demonstrated using a software package.

FORMAT: Lecture 3 hours, lab 2 hours

PREQUISITE: BIOE 3252.03 or equivalent

BIOE 4352.03: Food Engineering.

This class focuses on the process design of unit operations in food processing, preservation, packaging and storage. Topics include mass and energy balances, reaction kinetics modelling, size reduction, emulsification, food dehydration, packaging and storage, extrusion processes, freezing and thawing, evaporation and freeze concentration, crystallization, thermal process calculations and microwave heating. As a term project, a food process is simulated using a software package.

FORMAT: Lecture 3 hours, lab 2 hours

PREQUISITE: BIOE 3252.03 or equivalent

BIOE 4401.03: Design Project for Environmental Engineers I.

The objective of the class is to provide students with first hand experience in applying engineering design principles, biogeochemical analyses and environmental assessment techniques to the solution of specific environmental problems related to air, soil and water pollution control. Students are expected to display a high level of initiative and ingenuity in carrying out the project.

FORMAT: Lecture 1 hour, lab 5 hours

BIOE 4402.03: Design Project for Environmental Engineers II.

This is a continuation of BIOE4401 leading to a final presentation in both oral and written format.

FORMAT: Lecture 1 hour, lab 5 hours

BIOE 4612.03: Waste Disposal and Utilization.

The physical, chemical and biological properties of liquid and solid wastes are discussed and related to current handling and disposal methods. Solution to problems of pumping liquid waste, lagoon design and holding facilities are presented. Methods of land application of wastes are compared based on pollution problems and fertilizer issues. Technological advances of utilization of wastes

for the production of compost, single cell protein, alcohol, fertilizer, biogas, and chemicals are discussed. The class includes a term project, field trips, and seminars.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: AE1440, AE1441

BIOE 4651.03: Solar Energy Utilization.

The objective of the class is to provide students with the principles for the design and performance analysis of active and passive solar heating systems. Topics covered include: estimation of solar radiation availability, analysis of solar collectors and sun spaces, sensible and latent heat thermal storages. Procedures for the design and optimization of solar thermal systems are presented. A design project on the application of solar energy in residential, industrial or agricultural sector is required.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: AE1491

PREQUISITE: BIOE 3252.03 or equivalent

BIOE 4641.03: Environmental Control and IAQ.

The class deals with the design of heating, ventilating and air conditioning systems for controlled environment facilities such as: animal housing, residential and commercial buildings. Indoor air quality for humans and animals is discussed in relation to current methods of environmental control and energy conservation in buildings. Completion of an assigned term project is a part of this class.

FORMAT: Lecture 3 hours, lab 3 hours

PREQUISITE: BIOE 3252.03 or equivalent

Chemical Engineering

Dean

Bell, A.C., BSc (Dal), BEng (TUNS), SM (MIT), ScD (MIT), PEng

Professors

Al Taweel, A.M., BSc (Alexandria), MSc, PhD (Colorado), PEng
Amyotte, P.R., BEng (RMC), MSc(Eng) (Qu), PhD (TUNS), PEng
Fels, M., BEng, MEng (McG), PhD (Wat), PEng, Department Head
(Interim)

Gupta, Y.P., BSc (BHU), MEng (TUNS), PhD (Calgary), PEng
Pegg, M.J., BSc(Hons.), PhD (Leeds), CEng

Dean and Professor Emeritus

Foran, M.R., BSc (Sask), PhD (McG), DEng (TUNS), FCIC, PEng

Professors Emeriti

Chen, B.H., BSc (Nat. Taiwan), MEng, PhD (McG), PEng
MacKay, G.D.M., BEng, MEng (TUNS), PhD (McG), PEng
McMillan, A.F., BSc, MSc (Qu), PhD (MIT), PEng

Assistant Professor

Kuzak, S.G., BEng, MEng (McG), PhD (TUNS)

Adjunct Professors

Greenblatt, J., BSc, MSc (Dal), PhD (McG)
MacKnight, S.D., BSc, MSc, PhD (Dal)
Mintz, K.J., BSc, MSc (UBC), PhD (Tor)
Palczynski, R.J., MSc, PhD (Wroclaw), PEng

I. Introduction

The Chemical Engineering programme prepares students for careers in the chemical and process industries and in a variety of related fields. These encompass, among others, the traditional areas of environmental control, plastics and polymers, pulp and paper, instrumentation and process control, petrochemicals, petroleum and natural gas processing, and energy conversion and utilization, as well as the growing fields of biotechnology, food processing, composite materials, corrosion and protective coatings, and manufacture of microelectronic components.

The responsibilities assumed by Chemical Engineers include a wide range of activities such as research and development of novel products and processes, the design, development and operation of process plants, and management of technical operations and sales. The curriculum is designed to provide the student with a broad background in the underlying sciences of Chemistry, Physics and Mathematics. This is then combined with a detailed knowledge of engineering principles and practice, along with a good appreciation of social and economic factors. Thorough understanding of the principles is accomplished through lecture, tutorial and laboratory activities, and extensive use is made of the departmental computing facilities. Laboratory involvement is considered an important component of the students' education. Emphasis in the laboratory is placed on team work and on the development of problem-identification and problem-solving skills. The Department stresses the preparation of students for independent work and the development of interpersonal skills necessary for professional engineers. Elective classes provide the student with the opportunity to obtain additional training in one of the following areas: computers and process control, biotechnology, environment, energy resources and utilization, and research and development. In the later academic terms, students have an opportunity to work under conditions similar to those encountered in consulting and engineering organizations, particularly in the computer-aided-

design and process design classes. They may also undertake a thesis project involving original research activities under the guidance of a faculty member or an industrial supervisor. Research opportunities leading to the Master's and Doctorate degrees are offered in a wide range of topics within the Department as well as in conjunction with other departments and a number of research centres on the campus. Detailed information regarding the graduate programme can be obtained from the Department. Students have the option of joining either the co-op or non co-op undergraduate programmes or doing an internship.

II. Entrance Requirements

Admission requirements are those specified by the Faculty of Engineering.

III. Co-Op Programme

The Chemical Engineering programme at DalTech enables the students to participate in a work-study co-operative programme. This allows the students to work for four terms under the guidance and supervision of practising engineers, thereby acquiring skills that are complementary to their academic training. Such professional training programmes have been well received and enthusiastically supported by industry.

A. Work Terms

The University solicits appropriate jobs from industry and government. Students compete for jobs of their preference by submitting resumes and attending interviews. The employer's preferences and the student's preferences are matched if possible. Students should be prepared to work anywhere in Canada.

The University endeavours, but makes no commitment to find a job for every student. A student is at liberty to arrange his or her own job, but in order to qualify as part of the co-op work experience, it must be approved by the Department.

Each work term will be evaluated as "Met Requirement" or "Requirement Not Met" and will not affect the computation of averages. Academic credit will be assigned if satisfactory evaluations of the various components of the work term are achieved.

Students who have successfully completed the requirements for the degree of Bachelor of Engineering and who, in addition, have accumulated 1400 hours or more of approved work experience, will receive the "Co-op Programme" designation on their degree.

B. Non Co-op Programme

Non co-op students take the same academic programme as the co-op students; however, Term 6 may be taken before Term 5 if desired. In this way, the programme can be done in a total of 4 years.

C. Internship Programme

It is sometimes to the student's advantage to do the co-op programme as an internship whereby the work experience is done all at once in a 12- or 16-month block.

Normally this would be done after either Term 4 or Term 5; it is necessary to do academic Terms 7 and 8 in sequence.

D. Co-Op Schedule

Yr/Term	Fall	Winter	Summer
Year 1	AT1	AT2	FREE
Year 2	AT3	AT4	FREE
Year 3	WT1	AT5	WT2
Year 4	AT6	WT3	WT4
Year 5	AT7	AT8	

E. Programme Guide

Year 1 follows the common programme outlined in the Engineering section of this calendar.

Year 2, Term 3 (Fall)

- ENGM 2021.03 Engineering Mathematics III
- ENGM 2081.03 Computer Programming
- ENGI 2800.03 Engineering Thermodynamics I
- ECED 2000.03 Electric Circuits
- CHEM 2441.03 Organic Chemistry
- Humanities I

Year 2, Term 4 (Winter)

- ENGM 2062.03 Engineering Mathematics IV(a)
- ENGM 2032.03 Applied Probability & Statistics
- ENGI 2300.03 Fluid Mechanics
- CHEE 2404.03 Industrial Chemistry
- CHEE 2420.03 Fundamentals of Chemical Engineering
- IDIS 2000.03 Fundamentals of Environmental Engineering

Year 3, Work Term 1 (Fall)

Year 3, Term 5 (Winter)

- CHEE 3544.03 Computer-Aided Process Design
- CHEE 3522.03 Mechanical Unit Operations
- CHEE 3530.03 Chemical Engineering Thermodynamics
- CHEE 3550.03 Process Dynamics & Control
- CHEE 3510.03 Communications
- CHEE 3525.03 Separation Processes

Year 3, Work Term 2 (Summer)

Year 4, Term 6 (Fall)

- ENGM 3052.03 Applied Numerical Methods
- CHEE 3624.03 Heat Transfer
- CHEE 3632.03 Kinetics & Ideal Reactors
- IENG 3005.03 Engineering Economics
- METL 3500.03 Materials Science
- Technical Elective 1

Year 4, Work Term 3 (Winter)

Year 4, Work Term 4 (Summer)

Year 5, Term 7 (Fall)

- CHEE 4741.03 Process & Plant Design I
- CHEE 4726.03 Mass Transfer
- CHEE 4734.03 Chemical Reactor Design
- CHEE 4752.03 Process Modelling, Simulation & Control Engineers & Society

Year 5, Term 8 (Winter)

- CHEE 4842.03 Process & Plant Design II
- METL 3611.03 Corrosion and its Prevention
- Technical Elective 2
- Technical Elective 3
- Non-Technical Elective

E. Technical Electives

Computers and Process Control

- CHEE 4856.03 Process Optimization
- CHEE 4854.03 Computer Process Control
- BIOE 4312.03 Microcomputer Interfacing

Environment

- CHEE 4872.03 Air Pollution Control
- CHEE 4772.03 Environment Assessment and Management
- CIVL 4440.03 Water and Wastewater Treatment

Energy

- CHEE 4760.03 Fundamentals of Combustion
- CHEE 4862.03 Fundamentals of Combustion Engineering
- MECH 4810.03 Energy Conversion Systems
- MECH 4820.03 Energy From Renewable Resources

Research and Development

- CHEE 4791.03 Research Project I
- CHEE 4892.03 Research Project II

Non-Specific

- CHEE 4714.03 Polymer Science
- CHEE 4701.03 Loss Prevention and Risk Assessment

NOTE: Not all technical electives are available each year and other elective classes may be available. Please check with the department prior to registration.

IV. Classes Offered

CHEE Series: Chemical Engineering

CHEE 2404.03: Industrial Chemistry.

This class reviews chemical knowledge as applied to the industrial chemical process industries, with particular emphasis on Canadian applications. An examination of the relationships between kinetics, thermodynamics, unit operations and process design is made. FORMAT: Lecture 3 hours, lab 1 hour EXCLUSION: ChE0704

CHEE 2420.03: Fundamentals of Chemical Engineering.

The main objective of this class is to develop the student's ability to perform mass and energy balances on reactive and non-reactive processes. Introductory topics include systems of units and a study of process variables such as temperature, pressure and flowrate. Also covered are fundamental properties of multiphase systems: phase equilibrium, vapour pressure, phase rule, Raoult's and Henry's Laws, and colligative properties. Emphasis is placed on developing problem solving skills. FORMAT: Lecture 3 hours, lab 2 hours EXCLUSION: ChE0720

CHEE 3510.03: Communications.

The class attempts to develop skills in written, oral and general interpersonal communication. Formal lectures concentrate upon the organization of knowledge required to improve writing and verbal skills. An introduction is made to software programmes to analyze written text. Students are required to make several individual oral and written presentations. Students are also expected to participate in work orientation programmes (resume preparation, interview procedures) relating to the co-op work terms. FORMAT: Lecture 3 hours, lab 2 hours EXCLUSION: ChE0710

CHEE 3522.03: Mechanical Unit Operations.

This class introduces the student to the principles and practices involved in contacting, conveying, separating and storing single and multiphase systems. It includes the flow of incompressible and compressible fluids in conduits and past immersed bodies, as well as the transportation, metering, and mixing of fluids. Unit operations involved in the contacting and separation of phases, such as fluidization, sedimentation and centrifugation, are also studied. Prerequisite: An introductory class in fluid dynamics. FORMAT: Lecture 3 hours, lab 3 hours EXCLUSION: ChE0722

CHEE 3525.03: Separation Processes.

This class provides an introduction to cascade theory and develops fundamentals for design and analysis of staged operations such as leaching, liquid-liquid extraction and distillation. Topics include single-stage operations, multi-stage, counter-current cascade with and without reflux, and binary and multi-component distillation. FORMAT: Lecture 3 hours, lab 2 hours EXCLUSION: ChE1025

CHEE 3530.03: Chemical Engineering Thermodynamics.

The class deals with theory and practice of chemical thermodynamics. A brief review is given of concepts in physical chemistry: partial molal quantities and vapour-liquid equilibria in ideal and non-ideal systems including miscible and partially miscible components. The class also deals with thermophysical properties of pure liquids, properties of solutions, and a comprehensive study of vapour-liquid equilibrium and equilibrium constants in chemical reactions.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ChE0830

CHEE 3544.03: Computer-Aided Process Design.

The class aims to develop the student's ability to solve process design problems using packaged software. Major emphasis is placed on how to translate a flow sheet into a suitable form for simulation and design. Other topics include relational data bases, and design of specific unit operations using both available software and student-developed programmes.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ChE1044

CHEE 3550.03: Process Dynamics and Control.

This class provides an introduction to control of chemical processes. The dynamics of behaviour of simple processes is analyzed through transfer functions and means of determining the dynamic performance of feedback control systems are presented. An introduction to stability of control systems is made. Procedures for selecting and designing proportional, proportional-integral and proportional-integral-derivative controllers are discussed.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: ChE1050

CHEE 3624.03: Heat Transfer.

This class deals mainly with theories of heat transfer and their applications. The class includes heat transfer by steady and unsteady conduction in solids, convection heat transfer and an introduction to radiation heat transfer. Evaporation and design of heat exchangers are also discussed.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ChE0824

CHEE 3632.03: Kinetics and Ideal Reactors.

This class introduces the subject of chemical reaction engineering. Classical reaction kinetics concerning rates, mechanisms, temperature effects, and multiple reactions are studied. The concepts of batch, continuous stirred-tank and plug flow reactors are introduced for the ideal case.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ChE1032

CHEE 4772.03: Environmental Assessment and Management.

This class examines the ecological impacts of human activities with regard to water, air and soil pollution. Ecological theory and practise are reviewed and methods of environmental regulation and management considered in the light of the concepts of sustainability and maintenance of biodiversity. Lectures will include presentations by government and corporate regulators and managers. Tutorials will be devoted to the preparation and presentation of hypothetical environmental impact statements and assessments.

FORMAT: Lecture 3 hours, lab 1 hour

EXCLUSION: ChE1472

CHEE 4791.03: Research Project I.

The class objective is to provide experience in the application of engineering principles to the solution of a specific problem in Chemical Engineering. A research project is chosen in collaboration with a particular faculty member. The student then prepares a work plan, carries out a literature search pertinent to the problem, designs

and experimental setup, if needed, and arranges for the acquisition of necessary equipment. Interim and final progress reports are required in both written and oral formats.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: ChE1391

CHEE 4726.03: Mass Transfer.

Unit operations based on the theory of diffusional mass transfer are discussed. Emphasis is on engineering applications and the understanding of basic design theory. Topics include molecular and turbulent diffusion, interfacial mass transfer, simultaneous heat and mass transfer, and design of mass transfer equipment.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ChE1326

CHEE 4734.03: Chemical Reactor Design.

This class is a continuation of Kinetics and Ideal Reactors, and involves the application of reaction kinetics to problems of reactor design. After a review of ideal, isothermal reactors, the topics of multiple reactions, temperature effects (non-isothermal reactors) and non-ideal flow are considered in the design of a chemical reactor system. Heterogeneous reactors and catalysis are also discussed. Emphasis is placed on computational techniques for reactor problem solution.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ChE1334

CHEE 4741.03: Process and Plant Design I.

This class aims to develop the student's abilities in the synthesis of processing elements into an integrated plant that is capable of achieving a prescribed goal. Various design projects are undertaken to emphasize: process selection and economic evaluation, and detailed design of process equipment as well as optimization of processing subsystems such as distillation systems.

FORMAT: Lecture 2 hours, lab 4 hours

EXCLUSION: ChE1341

PREREQUISITES: CHEE 3624.03/ChE0824, CHEE 3522.03/ChE0722, CHEE 3544.03, ChE1044

CHEE 4752.03: Process Modelling, Simulation & Control.

This class deals with formulation of mathematical models describing the dynamic behaviour of chemical processes. Numerical methods for analyzing the dynamic response of lumped parameter and distributed parameter systems on digital computers are presented. Frequency response techniques are used to analyze and design control systems. Design methods for control of processes with dead time, inverse response and those requiring control of more than one variable are discussed.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: ChE1352

PREREQUISITE: CHEE 3550.03

CHEE 4842.03: Process and Plant Design II.

This class is a continuation of Process and Plant Design I, but emphasizes the synthesis of whole systems. Design projects cover process identification and selection, material and energy balance, system sensitivity to various parameters and preliminary process optimization, design and specification of processing units, plant layout, costing and economic evaluation.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: ChE1442

PREREQUISITES: CHEE 3522.03/ChE0722, CHEE 3624.03/ChE0824, CHEE 3544.03/ChE1044

CHEE 4854.03: Computer Process Control.

This class deals with digital computer control of chemical processes. Methods for analyzing and designing control systems using z-transforms are covered. Experience is provided in the use of currently popular control methods, such as model predictive control. An introduction is given for other advanced techniques, such as adaptive control, optimal control and stochastic control.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: CHE1454

PREREQUISITE: CHEE 4752.03 or instructor's permission

CHEE 4856.03: Process Optimization.

The class deals with the study and application of optimization techniques to engineering problems, with particular emphasis on chemical processes. Topics include analytical and numerical techniques for optimization of single and multi-dimensional problems, linear programming, nonlinear programming and dynamic programming. The class employs available computer software and student-developed programmes to solve the problems.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: CHE1356

CHEE 4760.03: Fundamentals of Combustion.

This class is an introduction to the principles of combustion processes. The properties of premixed gas flames are examined. Diffusion flames and the burning of liquid and solid fuels are studied. Ignition phenomena and spontaneous combustion, with particular reference to safety in the chemical process industries, are examined.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: CHE1460

CHEE 4862.03: Fundamentals of Combustion Engineering.

In this class, the principles of combustion processes (studied in Fundamentals of Combustion) are applied to industrial applications. The properties of solid, liquid and gaseous fuels are discussed. Various burner systems and the importance of combustion aerodynamics in boilers, furnaces and kilns are studied. The method of determining boiler and furnace efficiency and an introduction to pollution control are presented.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: CHE1462

CHEE 4872.03: Air Pollution Control.

This class deals with air pollution from the standpoint of its generation and control, measurement of pollutant concentrations, and dispersion calculations. Both gaseous and particulate matter emitted from combustion and industrial sources are considered. Other aspects of air pollution such as urban smog, acid rain and the greenhouse effect and possible remedial measures are also discussed.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: CHE1372

CHEE 4892.03: Research Project II.

This class is a continuation of Research Project I. The student conducts the planned research work, analyses the data obtained and critically evaluates the findings. Written and oral progress reports are required at mid-term. A written report and an oral presentation are required at the end of the term.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: CHE1492

Civil Engineering

Dean

Bell, A.C., BSc (Dal), BEng (TUNS), SM (MIT), ScD (MIT), PEng

Professors

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Research Professor

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Studies

Professors Emeritus

Meyerhof, G.G., BSc, MSc, PhD, DSc (London)
Ing. Dr. H.C. (Aachen), DSchc (Ghent), DEng (TUNS), DSchc (McM
and Queens), LL.Dhc (C' dia), FEIC, FRSC, PEng
Jaeger, L.G., BA, MA (Cantab), PhD (London), DSc (London), DEng
(Carleton, Memorial, TUNS)(hc), PEng, FRSE, FEIC, FCSCE

Associate Professors

Ali, N.A., BSc (Baghdad), MSc, PhD (N. Carolina State), PEng
Hansen, D., BScE (Guelph), MScE (UNB), PhD (Ottawa), PEng
F. Taheri, BEng, MAsc, PhD (TUNS), PEng
Trottier, J.F., BScA, PhD (Laval), PEng

Assistant Professor

Gagnon, G.A., BScE (Guelph), PhD (Waterloo)

Adjunct Professors

Bakht, B., BSc (Aligarh), MSc, PhD (London), FCSCE, FEIC, PEng
Erki, M.A., BSc, MAsc, PhD (Toronto), MCSC, MEAC, PEng
Gillie, R.C., BSc (Dal), BEng, MEng (TUNS), PhD (London), FRSA,
FCSCE, PEng

Adjunct Associate Professors

Cross, H.S., BA (Queens), MSc (Dal), CGWP, MCGS
Hart, W.C., BSc (Ohio Wesleyan), MA (Indiana), PhD (Dal)
McCurdy, R., MSc (Minnesota), PhD (TUNS)
Pegg, N., BSc (Guelph), MAsc (UBC), PhD (TUNS), PEng
Sastry, V.V.R.N., BE (Osmania), MB (IIS Bangalore), PhD (TUNS),
MEIC, MCGS, PEng

Adjunct Assistant Professors

Salah, M.A., Ph.D. (TUNS)
Oguejiofor, E.C., MSc, Ph.D. (U. of Sask)

I. Introduction

Civil Engineering is concerned with the engineering (planning, design and construction) of systems of constructed facilities related to the needs of society. The scope and complexity as well as the interdisciplinary involvements of Civil Engineering continues to increase rapidly with the development of modern science and technology and the population growth with its spiralling demands upon the air-land-water environment. The preparation of the Civil Engineering student is aimed toward meeting these challenges through innovative application of known principles, creative research to discover new approaches, and imaginative design to fulfill society's needs.

Civil Engineering graduates are found in responsible engineering and administrative positions in industry and government. Some become consultants in planning, design or construction of engineering projects or in specialized fields where the application of research to the solution of practical problems is important. The professional practice of a Civil Engineer includes the conception, design, construction, operation, and maintenance of private and public projects. Included in this are bridges, buildings, highways, airports, railroads, harbors, docks, subways, tunnels, water supply and purification systems, sewage collection and treatment facilities and water power developments.

The curriculum consists of a systematic study of civil engineering problems and theory, selected to illustrate the application of scientific principles and engineering techniques in the analysis, design and synthesis of Civil Engineering works. Elective classes are provided to permit some degree of specialization in a particular branch of Civil Engineering.

The laboratory programs in each of the Civil Engineering subjects are conducted in the MacDonald Building, Building D. The students test and experiment with materials, components, models and processes to achieve the blend of experiment and theory that is characteristic of Civil Engineering education. The laboratories are equipped for tests and experiments involving structural components and materials (steel, concrete, timber, asphalt, masonry, plastics), highway materials, soils and soil structures and foundations, photo-elasticity and stress analysis of structural models, photogrammetry and surveying, hydraulic models, sanitary engineering processes and the analysis of water and wastewaters.

II. Co-Operative Programme

The Civil Engineering program enables students to participate in a work/study Co-operative program. This will allow students to work for three terms under the guidance and supervision of practicing engineers, thereby acquiring skills that are complementary to their academic training. Such professional training programs have been well received and supported by industry and government agencies.

A. Work Terms

The University solicits appropriate positions in industry and government. Students compete for positions of their preference by submitting resumes and attending interviews. The employer's preferences and the student's preferences are matched wherever possible. Students should be prepared to work anywhere in Canada.

The University endeavours, but makes no commitment to find a position for every student. A student is at liberty to arrange his or her own employment, but in order to qualify as part of the Co-op work experience, the position must be approved by the Department.

Each work term will be evaluated and academic credit will be granted on the condition that satisfactory evaluations of the various components of the work term are achieved.

Students who have successfully completed the requirements for the degree of Bachelor of Engineering and who, in addition, have accumulated 1400 hours or more of approved work experience, will receive the "Co-op Program" designation on their degree.

B. Co-Op Schedule

Yr/Term	Fall	Winter	Summer
Year 3	AT5	WT1	WT2
Year 4	AT7	AT6	WT3
Year 5	WT4	AT8	

NOTE: Terms 6 and 7 are interchangeable

C. Non Co-Op Schedule

Yr/Term	Fall	Winter	Summer
Year 3	AT5	AT6	FREE
Year 4	AT7	AT8	

D. Co-Op Programme Guide

Years 1 and 2 follow the common programme outlined in the Engineering section of this calendar.

Year 3, Term 5 (Fall)

- CIVL 3300.03 Hydraulics
- CIVL 3500.03 Theory of Structures I
- CIVL 3700.03 Mechanics of Materials II
- CIVL 3100.03 Soil Mechanics I
- CIVL3710.03 Engineering Surveying
- CIVL 3720.03 Properties of Construction Materials

Year 3, Work Term 1 (Winter)

Year 3, Work Term 2 (Summer)

Year 4, Term 6 (Fall)

- Complementary Studies
- CIVL3510.03 Theory of Structures II
- CIVL 3200.03 Transportation Engineering
- CIVL 3110.03 Soil Mechanics II
- CIVL 3520.03 Design of Concrete Structures

Technical Elective (Choose one of the following)

- CIVL3730.03 Building Construction
- CIVL3400.03 Environmental Chemistry for Engineers

Year 4, Term 7 (Winter)

- Complementary Studies
- CIVL4300.03 Engineering Hydrology
- CIVL4500.03 Design of Steel Structures I
- CIVL4200.03 Transportation Systems
- CIVL4400.03 Water Supply and Pollution Control

Technical Elective (Choose one of the following two)

- CIVL4710.03 Construction Planning
- CIVL4410.03 Engineering Hydrogeology

Year 4, Work Term 3 (Summer)

Year 5, Work Term 4 (Fall)

Year 5, Term 8 (Winter)

- CIVL4700.03 Civil Engineering Project
- CIVL4720.03 Civil Engineering Computation

Technical Electives (Choose four of the following)

- CIVL4540.03 Introduction to Finite Element Analysis
- CIVL4250.03 Highway Engineering
- CIVL4350.03 Hydraulic Engineering
- CIVL4100.03 Earth Slopes & Embankments
- CIVL4420.03 Geo-Environmental Engineering
- CIVL4510.03 Design of Concrete Structures II
- CIVL4520.03 Design of Steel Structures II
- CIVL4530.03 Design of Timber and Masonry Structures
- CIVL4430.03 Water Distribution and Sewerage Systems
- CIVL4440.03 Water and Wastewater Treatment

Notes:

1) One or more graduate class may be included as technical electives in Term 14, however, permission of the instructor and Department is required in order to register for such class.

2) Not all of the technical elective classes will be offered each year. A list will be published each year during Term 12.

D. Four-Year Programme Guide

Years 1 and 2 follow the common programme outlined in the Engineering section of this calendar.

Year 3, Term 5 (Fall)

- See Term 5 Of Co-op Programme

Year 3, Term 6 (Winter)

- See Term 6 Of Co-op Programme

Year 4, Term 7 (Fall)

- See Term 7 Of Co-op Programme

Year 4, Term 8 (Winter)

- See Term 8 Of Co-op Programme

III. Classes Offered

CPST 2000.03: Technical Communications.

The class deals with several aspects of professional activity including the preparation of technical memos, letters and reports. Topics include professional associations, the relationship of engineers to society and the subject of engineering societies and their work in publications, codes and standards. Guest lecturers are invited to participate in discussions. Throughout the class students practice their writing skills by submitting assignments which are marked for clarity, style and presentation as well as for proper English.

EXCLUSION: ME3210.

ECED 2000.03: Electric Circuits.

This is an introductory class in electric circuit analysis. The material covered starts with a review of the fundamental circuit variables such as voltage, current charge, power and energy. Kirchhoff's laws are introduced and developed into node and mesh analysis techniques. Terminal behaviour and circuit equivalence including Thevenin and Norton circuits are covered. Analysis with controlled sources and energy storage elements is developed including steady state and transient response for first order networks. Phasors and sinusoidal steady state are introduced. Students are introduced to circuit simulation tools such as p-spice.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ENGI 2230.03

ENGI 2200.03: Mechanics of Materials.

This introductory class 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. Incompressible viscous flow through pipes is also presented.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ENGI 2331.03

ENGI 2300.03: Fluid Mechanics.

This second class in Engineering Mechanics considers the kinematics and kinetics of a single particle and a single rigid body. The class builds on the concepts introduced in MECH 1200 (Mechanics I). Both vector and scalar methods are used. Topics include kinematics of a particle, kinetics of a particle, kinematics of a rigid body in plane motion, and planar kinetics of a rigid body.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ENGI 2341.03

ENGI 2800.03: Engineering Thermodynamics I.

Fundamental definitions and concepts are reviewed. Engineering analysis of properties, heat, work and systems is carried out. The zeroth, first, and second laws are presented. Ideal gases and mixtures, real gases, liquid-vapour relations, availability, irreversibility, entropy concepts, and flow in nozzles and diffusers is examined. Gas and vapour power cycles are studied with emphasis on cycle analysis.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ME 3810

ENGM 2021.03: Engineering Mathematics III.

This class covers first order linear and non-linear differential equations, differential equations of higher order with constant coefficients, applications to Engineering problems, power series

solutions, Laplace transforms, periodic functions, applications of Laplace transforms to linear systems, Fourier Series, the line spectrum.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MATH 3110.03 and MATH 3120.03

ENGM 2032.03: Applied Probability and Statistics.

The topics covered include probability laws and the interpretation of numerical data, probability distributions and probability densities, functions of random variables, joint distributions, characteristic functions, inferences concerning mean and variance, tests of hypotheses, and introduction to linear regression. The class emphasizes engineering applications and makes extensive use of statistical computer packages.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MATH 2060.03 and MATH 2080.03

ENGM 2062.03: Engineering Mathematics IV(a).

This class covers geometric vectors in three dimensions, dot product, cross product, lines and planes, complex numbers, systems of linear equations, matrix algebra; matrix inverse, rank, determinants, Cramer's rule, space curves, arc length, curvature, functions of several variables, partial derivatives, implicit functions, constrained and unconstrained extrema, multiple integrals, surface area and volume, scalar and vector fields, line integrals, gradient, divergence and curl.

FORMAT: Lecture 4 hours, lab 1 hour

EXCLUSION: MATH 2480.03 and MATH 2490.03

ENGM 2081.03: Computer Programming.

This class covers fundamental programming principles including flow control, modularity, and structured programming. The student will implement significant programs in the C language to solve engineering problems.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ENGI 2240.03

IENG 2005.03: Engineering Economics.

This class deals with the ergonomics of Engineering Design. After introducing fundamental concepts and cash flow diagrams, interest factors are dealt with in some detail. A variety of discounted cash flow techniques are covered including rate of return calculations. Inflation, tax, replacement and risk are also amongst the topics considered.

FORMAT: Lecture 3 hours, lab 1 hour

EXCLUSION: IE0718

MECH 2100.03: Engineering Design & Graphics II.

This class provides a project-based exercise in the engineering design process. Students work in teams and as individuals on defined projects which utilize knowledge and skills in graphics, statics, computing, and mechanics of materials. The projects encompass conceptual design, detailed analysis, engineering drawings, experimentation, physical model fabrication, laboratory testing, and preparation of professional reports.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ENGI 2101

CIVL Series: Civil Engineering

CIVL 3100.03: Soil Mechanics I.

This class is concerned with the physical and mechanical properties of soils. It includes the subjects of soil exploration, index properties and soil classification, permeability and seepage characteristics, soil compressibility and consolidation, and stress-deformation-strength behaviour of soils. The laboratory sessions involve the experimental evaluation of soil properties and solution of related problems.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: CE0735

CIVL 3110.03: Soil Mechanics II.

The geotechnical aspects of the design of cuts, embankments, earth dams, retaining walls, and foundations are discussed. Methods of analysis for slope stability, earth pressures, bearing capacity, and the

settlement of foundations are outlined. The application of these methods to the design of particular structures is included in the laboratory sessions.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE1236

CIVL 3200.03: Transportation Engineering.

This class commences with an introduction to transportation engineering in the context of planning, design and operations of urban and rural systems. The class also provides an introduction to route location with special emphasis on Canadian standards and specifications. Materials covered also include a detailed study of road design elements, vehicle motion, vehicle/pavement interaction and principles of roadway capacity.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE0815

CIVL 3300.03: Hydraulics.

Fluid mechanics principles are applied to practical hydraulic problems involving flow in open channels, including discharge and velocity measurements. These aspects are explained in lectures and by laboratory measurements and demonstrations. Modelling lessons are applied in tutorial sessions and confirmed by laboratory models. The fundamentals of flow net sketching are discussed.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: CE0725

CIVL 3400.03: Environmental Chemistry for Engineers.

The objective of this class is to examine those aspects of organic and inorganic chemistry that are particularly relevant to environmental engineers. Fundamental concepts such as reaction kinetics, thermodynamics, equilibrium chemistry, environmental fate and properties of organic compounds will be discussed. In addition, the class will develop an understanding for the quantitative analysis of treated waters. Laboratory assignments are an integral part of the class.

CIVL 3500.03: Theory of Structures I.

The focus of the class is the analysis of determinate structures. Analysis techniques for beams, frames and trusses are presented. The use of the National Building Code of Canada for the calculation of loads is introduced. Influence lines for moving loads on beams and trusses and the calculation of elastic deformations by several methods are covered. The introduction of approximate methods for analysis of indeterminate structures is the final topic.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE0745

CIVL 3510.03: Theory of Structures II.

This class develops the analytical methods used to analyze indeterminate structures: virtual work, least work, three moment equation, slope-deflection and moment distribution. Influence lines for indeterminate structures are also developed. Matrix methods of structural analysis and computer applications are introduced.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE0846

CIVL 3520.03: Design of Concrete Structures I.

This class deals with the basic design principles applied to reinforced concrete structural elements. Limit State Design methods of flexural members, beams, one-way slab systems, design of columns and footings will be covered.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE1050

CIVL 3700.03: Mechanics of Materials II.

This class deals with the analysis of strains, displacements, and stresses in solids beyond the scope of an introductory class. Numerical techniques are emphasized when analytical solutions are not practical. The subjects covered are: 3-Dimensional states of stress and strain, failure theories, torsion, bending and shear in

sections, column buckling, beam-column, and an introduction to plasticity and material orthotropy. Experimental works in laboratory will examine some of the theories covered.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE0848

CIVL 3710.03: Engineering Surveying.

This class covers surveying theory, methods, layout procedures, and calculations necessary for elementary mapping and most Civil Engineering construction work. During the practical session of this class students become familiar with the use and operation of modern surveying equipment to measure distances, elevations, directions, and angles.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE0765

CIVL 3720.03 Properties of Construction Materials.

The class deals with the structural and physical properties of materials important in civil engineering practice. Topics considered include: concrete mixes and fresh and hardened concrete; properties, uses and preservation of timber; properties of masonry units and soils, in relation to strength and behaviour under conditions encountered in civil engineering problems. Properties of bituminous materials, metals and polymers are also considered in detail. The laboratory includes experiments designed to illustrate the basic properties of these materials.

PREREQUISITE: ENGI 2200.03

EXCLUSION: CE0830

CIVL 3730.03: Building Construction.

The class presents the materials and types of construction primarily used in residential, commercial and industrial buildings. The subjects covered are: foundation systems, wall systems, roof systems, doors and windows, drainage and waterproofing, thermal and sound insulation, inspection of construction and failures in building construction.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE1049

CIVL 4100.03: Earth Slopes and Embankments.

Methods for the stability analysis of natural slopes, cuts, embankments and earth dams are outlined. The effects of porewater pressures and earthquake loads are considered, as well as stabilization methods for slopes. Seepage through small earth dams, together with measures to control seepage, is considered. A project dealing with earth slopes or embankments is undertaken by each student and an oral presentation is made to the class. Laboratory sessions deal with the evaluation of a particular soil for use in embankment construction.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: CE1438

CIVL 4150.03: Soils and Foundations.

This class deals with the nature and physical properties of soil. It covers the subjects of index properties, soil moisture, compressibility and consolidation characteristics, and stress-deformation-strength behaviour of soils. It presents the methods of analysis for the stability of slopes, evaluation of earth pressures and safe bearing capacity, and the design of various types of foundation elements. In the laboratory sessions certain soil properties are experimentally evaluated.

EXCLUSION: CE0741/1041

CIVL 4200.03: Transportation Systems.

This class covers urban transportation planning, transportation demand and supply, transportation management. The environmental impact of transportation systems such as noise and air pollution will be examined. Methods to measure, predict, and evaluate impact of transportation modes will be covered.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE1216

CIVL 4250.03: Highway Engineering.

This class deals with traffic engineering and pavement design. Topics in traffic engineering include traffic stream characteristics, traffic studies and analysis, traffic control devices, and capacity-performance relations for urban streets and intersections. Topics in pavement design include pavement structure and types, factors involved in pavement structure design, and design of flexible and rigid pavements.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE1420

CIVL 4300.03: Engineering Hydrology.

The emphasis in this class is on quantitatively describing the physical processes in the hydrologic cycle. Such processes include precipitation, evaporation, infiltration, groundwater movement, surface runoff, as well as open-channel and reservoir routing effects. A working rainfall-runoff model is developed and by convolution this model is used to produce a design hydrograph, so as to determine the appropriate size of a detention pond. Statistical hydrology and snow hydrology are also discussed.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE1070

PREREQUISITES: ENGM 2032.03 or AM3131, CIVL 3300.03 or CE0725

CIVL 4350.03: Hydraulic Engineering.

This class deals with the application of hydraulics in civil engineering design. The topics include flow through pipelines, design of culvert systems, storage dams, overflow and chute spillways with emphasis on the design of stilling basins. Hydraulic machinery will be discussed with an emphasis on the selection of a machine for a given use. Design of single port and multiport outfall structures for effluent disposal in rivers and in oceans will also be discussed.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: CE1426

CIVL 4400.03: Water Supply and Pollution Control.

This class is concerned with the hydraulic and hydrologic basis for the design of our water-related urban infrastructure. Specifically, the design of potable water distribution systems, sanitary sewerage systems, and stormwater management systems is presented. Students do a pre-design of one of these systems for an actual sub-2)

This relatively quantitative introduction to hydrogeology begins with a review of key definitions and hydraulic principles for flow through porous media. This is followed by consideration of well hydraulics in the context of the evaluation and management of groundwater resources. The theory and application of numerical methods is discussed in relation to simple groundwater systems, which is followed by discussion of the chemistry of natural and contaminated systems.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE1027

PREREQUISITE: CIVL 3300.03/CE0725, MINE 0700

CIVL 4420.03: Geo-Environmental Engineering.

This class deals with the geotechnical aspects of waste disposal and management. The aspects that are considered include nature and sources of subsurface pollution; site evaluation and selection; design of land fills, and liners; clean-up and decontamination techniques; regulations dealing with handling and storage of hazardous waste, and the role of numerical models in analyzing waste management projects.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE1441

CIVL 4430.03: Water Distribution and Sewerage Systems.

This class is concerned with the hydraulic and hydrologic basis for the design of our water-related urban infrastructure. Specifically, the design of potable water distribution systems, sanitary sewerage systems, and stormwater management systems is presented. Students do a pre-design of one of these systems for an actual sub-

division, and present their designs to the class. The minimization of environmental impacts due to the construction of a subdivision is also presented, both qualitatively and quantitatively.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE1472

PREREQUISITE: CIVL 4400.03 or CE1271, CIVL 4300.03 or CE1070

CIVL 4440.03: Water and Wastewater Treatment.

The focus of the class is on design of water treatment and municipal pollution control plants. Lectures and laboratory periods are on physical chemical and microbiological qualities of water and municipal wastewater. Lectures include various unit operations and unit processes of water and domestic wastewater treatment. Field visits to local water and wastewater treatment plants are included.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE1473

CIVL 4450.03: Environmental Engineering.

The class emphasis is on engineering solutions to environmental management problems. Civil engineers, before they embark on major construction projects (such as highways, airports, pipelines) are expected to participate in teams which conduct environmental impact assessment. Students are trained to conduct such surveys as part of a multi-disciplinary team. The subject matter also includes sludge handling, treatment and disposal, solid wastes management, air pollution control and lake and river water quality management. Field trips and student seminars are integral parts of the class.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE1274

CIVL 4500.03: Design of Steel Structures I.

This class presents the design of structural steel components and simple frames in buildings and bridges using limit states design methods. The theoretical and experimental background of the standardized design procedures is introduced. The subjects covered are: material and product properties, tension members, compression members, beams, and welded and bolted connections.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE1252

CIVL 4510.03: Design of Concrete Structures II.

This class presents the Limit State Design methods for reinforced and prestressed structural members. The topics covered are: Limit States, Load and Resistance factors, design of buildings, two-way slab system, principles and design methods of prestressed concrete structures used in buildings and bridges.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE1451

CIVL 4520.03: Design of Steel Structures II.

Advanced class in design of steel structures. Includes the behaviour of and the limit states design procedure for the following structural elements: welded connections, beam-columns, frames, plate girders, and composite steel and concrete members.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE1457

PREREQUISITES: CE1252

CIVL 4530.03: Design of Timber and Masonry Structures.

This class reviews the codes currently in use for both structural types. Limit States Design principles are used for the design of timber beams, columns, tension members, trusses and arches. Shear walls, diaphragms and connection design are presented. The masonry component reviews the properties of the materials used, and concentrates on the design of flexural members and combined load members. The class concludes with principles of masonry building design.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE1458

CIVL4540.03: Introduction to Finite Element Methods (FEM).

Linear elasticity and variation principles of elasticity will be reviewed. These principles will be used in developing the theory and analysis of stress-deformation, general constitutive relations, fluid flow, heat flow and beam bending. Typical FEM codes will be used to solve a variety of practical civil engineering problems.

EXCLUSION:

PREREQUISITE: CIVL 3700.03 or equivalent

CIVL 4700.03: Civil Engineering Project.

The class objective is to provide experience in the application of engineering principles to the solution of a specific problem in Civil Engineering. Students are required to select a topic and prepare a proposal, including a work program for a project to be undertaken under the supervision of a faculty member. Projects may include laboratory or field experiments, design problems, or literature reviews. Students are expected to prepare a typewritten report and to make an oral presentation of their project.

FORMAT: Lecture 1 hour, lab 3 hours

EXCLUSION: CE1404

CIVL 4710.03: Construction Planning.

This class deals with construction administration, bidding procedures, cost controls, planning and execution of civil engineering construction projects. The class also covers planning and scheduling techniques such as CPM and PERT. The class presents basic methods of estimating construction costs, with applications to buildings, bridges, foundations, highways and earthworks.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE1027

C4720.03: Civil Engineering Computations.

This class introduces the application of various computational methods for solving a range of practical problems in civil engineering. Example problems may include: beam deflections, analysis of space-frames, structural stability, structural vibration, optimization, infiltration and routing in hydrology, groundwater boundary-value problems, and other topics of interest in civil engineering of a computational nature.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE1059

PREREQUISITES: ENGM 2032.03 or AM3131, ENGM 2062.03 or AM3112

Electrical and Computer Engineering

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I. Introduction

Of all the various disciplines, perhaps no other branch of engineering can claim to have such an impact on modern society as Electrical & Computer Engineering. The ease, speed and precision by which electrical energy and electrical signals can be transmitted, transformed and controlled has influenced not only the everyday life of people, but has also changed the - of many other disciplines. Over the short span of only a few decades, Electrical & Computer Engineering has grown from a study of abstract phenomena to a multi-branch discipline with significant applications in the areas of power systems, communication systems, control systems, computers and electronics. This rapid growth, coupled with major advances in technology and material science, has made the field a very dynamic one, and poses a challenge to the student, to the educator and to the practising Electrical & Computer Engineer.

To meet the challenge of a rapidly expanding field, the E&CED curriculum has to be based on the physical and mathematical principles which constitute the unchanging foundation of the discipline, followed by classes which apply these principles to various specialized areas.

In the final year a number of technical elective classes are provided which enable the student to obtain a deeper, more detailed understanding of current technology in a field of interest. Technical electives may also be chosen from listed classes offered by other Departments. Also during the final year the students, usually in teams of 2, work on a project requiring the application of knowledge to a realistic engineering problem. The projects are submitted by professionals in local industrial and research facilities who then provide supervision in conjunction with an assigned Faculty Advisor.

Laboratory sessions form an integral part of most Electrical & Computer Engineering classes. These sessions are conducted in eight laboratories housed in C Building. The Electrical & Computer Engineering Department offers co-operative as well as internship programs. The internship program gives the student an opportunity to work in industry for 16 continuous months prior to graduation.

II. Degree Programmes

A. Electrical Engineering Programme

This is the curriculum for the standard electrical engineering programme

Year 2, Term 3 (Fall)

- ECED 2000.03 Electric Circuits
- ECED 2200.03 Digital Circuits
- ENGM 2021.03 Engineering Mathematics III
- ENGM 2041.03 Applied Linear Algebra
- ENGM 2081.03 Computer Programming
- ENGI 2800.03 Engineering Thermodynamics I

Year 2, Term 4 (Winter)

- CPST 2000.03 Technical Communications***
- ECED 2001.03 Circuit Analysis
- ECED 2900.03 Electrical Engineering Design I
- ENGM 2032.03 Applied Probability & Statistics
- ENGM 2262.03 Engineering Mathematics IV (b)
- ENGM 2282.03 Data Structures and Numerical Methods

Year 3, Term 5 (Fall)

- ECED 3003.03 Networks & Systems
- ECED 3100.03 Electromechanics***

- ECED 3201.03 Introduction to Electronics
- ECED 3300.03 Electromagnetic Fields***
- ECED 3500.03 Signal Analysis
- ECED 3800.03 Electrical Materials

Year 3, Term 6 (Winter)

- ECED 3101.03 Power Systems I**
- ECED 3202.03 Analog Electronics
- ECED 3203.03 Instrumentation
- ECED 3402.03 Real Time Systems
- ECED 3501.03 Analog Communications
- ECED 3502.03 Introduction to Signal Processing***
- ECED 3901.03 Electrical Engineering Design II

Year 4, Term 7 (Fall)

- ECED 4204.03 Microprocessors
- ECED 4301.03 Waves & Propagation***
- ECED 4503.03 Digital Communications
- ECED 4600.03 Modern Controls
- CPST 2035.03 The Engineering Profession
- TE***

Year 4, Term 8 (Winter)

- ECED4601.03 Digital Controls***
- ECED4902.03 Senior Year Project
- IENG2005.03 Engineering Economics
- NTE
- TE***

**A "Writing Class" is one in which written work is considered in detail as part of the grading activity. Students must choose a writing class from the approved Faculty list. These classes are:

- Classics 1000.06, 1010.06, 1100.06
- German 1000.06
- Political Science 1103.06
- Philosophy 1010.06
- English 1000.06
- Theatre 1000.06
- Russian 2050.06

*** If you choose the computer engineering option, take the classes listed in A. Computer Engineering Option in place of these.

B. Computer Engineering Option

This is an option within the B.Eng. Degree Programme in Electrical & Computer Engineering, available to students registered in the Department of Electrical & Computer Engineering who wish to specialize in the area of Computer Engineering. Students wishing to pursue the Computer Engineering option must have completed ECED 2400.03 Systems Analysis prior to Term 5.

Students follow the Electrical Engineering programme for Terms 1 to 4. In Year 2, Term 4, the student starts the computer engineering option as outlined below.

Year 2, Term 4 (Winter)

- ECED2400.03 Systems Analysis
- ECED 2001.03 Circuit Analysis
- ECED 2900.03 Electrical Engineering Design I
- ENGM 2032.03 Applied Probability & Statistics
- ENGM 2262.03 Engineering Mathematics IV (b)
- ENGM 2282.03 Data Structures and Numerical Methods

Year 3, Term 5 (Fall)

- ECED 3003.03 Networks & Systems
- CS3120.03 Operating Systems
- ECED 3201.03 Introduction to Electronics
- ECED4204.03 Microprocessor
- ECED 3500.03 Signal Analysis
- ECED 3800.03 Electrical Materials

Year 3, Term 6 (Winter)

- ECED3402.03 Real Time Systems
- ECED 3202.03 Analog Electronics
- ECED 3203.03 Instrumentation

- ECED 3402.03 Real Time Systems
- ECED 3501.03 Analog Communications
- CPST2000.03 Technical Communications
- ECED 3901.03 Electrical Engineering Design II

Year 4, Term 7 (Fall)

- ECED 4204.03 Microprocessors
- ECED3100.03 Electromechanics
- ECED 4503.03 Digital Communications
- ECED 4600.03 Modern Controls
- CPST 2035.03 The Engineering Profession
- ECED4403.03 Computer Architecture

Year 4, Term 8 (Winter)

- ECED4404.03 Computer Networks & Communications
- ECED4902.03 Senior Year Project
- IENG2005.03 Engineering Economics
- NTE
- ECED3502.03 Introduction to Signal Processing

D. Cooperative Education Programme

The schedule for the cooperative education program includes eight academic terms (AT) and three work-terms (WT), as follows:

Yr/Term	Fall	Winter	Summer
Year 1	AT1	AT2	FREE
Year 2	AT3	AT4	FREE
Year 3	AT5	WT	AT6
Year 4	AT8/WT	AT7	WT
	AT8		

A student may find his/her own industry work position for the term to count as a work-term. Departmental approval is required.

A student may elect to do an internship at A7?????.

A student may elect to do Term 8 before Term 7 if the classes are offered, in order to complete the programme in four years. In 1998/99 Term 6 will be taught in the winter instead of the summer. In 1999/2000 Term 7 will be taught in the Fall and Term 8 in the winter.

III. Classes Offered

ECED 2000.03: Electric Circuits.

This is an introductory class in electric circuit analysis. The material covered starts with a review of the fundamental circuit variables such as voltage, current, charge, power and energy. Kirchhoff's laws are introduced and developed into node and loop analysis techniques. Terminal behavior and circuit equivalence including Thevenin and Norton circuits are covered. Analysis with controlled sources and energy storage elements is developed including steady state and transient response for first order networks. Phasors and sinusoidal steady state are introduced. Students are introduced to circuit simulation tools such as p-spice.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ENGI 2230.03

ECED 2001.03: Circuit Analysis.

This class covers advanced circuit analysis techniques, starting with sinusoidal excitation. The concepts of phasors and complex impedance are fully developed. Mutual inductance and magnetically coupled coils are used to introduce transformer behavior and performance. Real and reactive power flow is covered before the introduction of balanced three phase circuits for power distribution. Symmetrical components are introduced as a means of dealing with unbalanced networks. The concepts of grounding and harmonics are also introduced.

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITES: ECED 2000.03

ECED 2200.03: Digital Circuits.

This class includes an introduction to: Boolean algebra, encoders, decoders, shift registers, asynchronous and synchronous counters, together with timing considerations. Design of asynchronous circuits, synchronous sequential circuits, and finite state machines,

is covered. Karnaugh mapping techniques and state tables and diagrams are taught. Programmable logic is introduced. Contemporary computer aided design and analysis software is used throughout the class.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ENGI 2231.03

ECED 2400.03: System Analysis.

Requirement analysis, specifications, concepts of transforming an ill-defined problem into a set of specifications. Functional decomposition and data dictionaries. Top down structured and object oriented analysis techniques. Laboratory and assignment work will address the analysis of relatively complicated systems using the different techniques.

FORMAT: Lecture 3 hours, lab 2 hours

ECED 2900.03: Electrical Engineering Design I.

This class will cover aspects of design methodology in electrical engineering. Issues addressed include: the engineering design method covering design overview, problem decomposition, solving & planning; decision support techniques, uncertainty and time management; analysis and synthesis for implementation, technical design, design evaluation, prototype construction and evaluation technical design rules, design heuristics, testability, manufacturability, and troubleshooting; project reports; and ethics in design including the employee's dilemma, the value of written records, and reporting problems.

FORMAT: Lecture 2 hours, lab 3 hours

ECED 3003.03: Networks & Systems.

This class provides the basic networks and systems analysis skills required in subsequent classes in the Electrical and Computer Engineering program. It covers topics such as signals and systems modelling concepts; applications of Laplace transform in network analysis, Bode plots, block diagram; state-variable analysis; generalized two-port parameters; properties and analysis of linear time-invariant (LTI) systems, the convolution integral and Eigenfunction and Eigenvalues of LTI systems.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: ECED 2001.03, ENGM 2021.03

EXCLUSION: EE3020

ECED 3100.03: Electromechanics.

This class covers the principles of electromechanical energy conversion and electric motors. A review of magnetic field behavior leads to magnetic circuit calculations and permanent magnet circuit behavior. Energy balance principles are used to develop force and torque relationships for many electromechanical applications including relays, meter movements and motor operation. Basic principles of motor operation such as rotating magnetic fields, efficiency and machine ratings are given as a prelude to an in depth presentation of AC and DC motor behavior. Emphasis is placed on motor control and application.

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITES: ECED 2001.03

EXCLUSION: EE4110

ECED 3101.03: Power Systems I.

This class presents the development of the models of each of the components making up a power system including: transformer behavior (power, control and instrument transformers), synchronous machine behavior (cylindrical rotor and salient pole theory) and transmission line behavior (lumped and distributed parameter). Per unit normalization is covered. The equipment models are compiled to present network models that can be used to study power system operation. Load flow is discussed as well as fault estimation and circuit protection.

FORMAT: Lecture 3 hours, Lab 2 hours

PREREQUISITES: ECED 3100.03, ECED 2001.03

ECED 3201.03: Introduction to Electronics.

The class gives an introduction to semiconductor physics. The theory of operation of semiconductor diodes, bipolar junction transistors (BJTs), and junction and metal oxide field effect

transistors (MOSFETs), is covered in detail. The analysis and design of diode, BJT, and MOSFET circuits is covered including voltage multipliers and low frequency small signal amplifiers.

Contemporary computer aided design and analysis software is applied to the aforementioned circuits.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: EE3212

ECED 3202.03: Analog Electronics.

This class covers behaviour of real op-amps, BJTs and FETs in high-frequency and multistage applications. Topics include linear and non-linear op-amp circuits; current mirrors, active loads and biasing; multistage amplifier design; feedback in amplifiers; high-frequency narrow-band amplifier tuning, coupling and matching; crystal, resonant, phase-shift and relaxation oscillators; waveform generation; class A, AB, B, C and D power amplifiers; voltage regulator design; heatsinking; design of MOSFET motor control circuits and pulse-width modulators. In addition, filtering, noise and distortion are introduced.

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITES: ECED 3800.03, ECED 3003.03, ECED3201.03

EXCLUSION: EE4223

ECED 3203.03: Instrumentation.

This class provides an in depth coverage of instrumentation systems and practices. Topics covered include: accuracy, precision, resolution and linearity, noise and noise sources, noise-equivalent bandwidth, signal conditioning and low noise measurement technique, quantization, sampling, shielding and grounding.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: ECED 3201.03

ECED 3300.03: Electromagnetic Fields.

This class forms an introduction to basic electromagnetic principles upon which Electrical Engineering is based. The laws underlying the theory are presented in integral and differential form. A classical development of electrostatics, steady state current, and magnetostatics will lead to Maxwell's equations. The theory developed is applied to calculating circuit parameters such as resistance, capacitance, and inductance for any electronic or magnetic structure.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: ENGM 2262.03

EXCLUSION: EE3320

ECED 3402.03: Real Time Systems.

This class reviews system analysis and design techniques and then addresses real time implementation methods. Real time operating system (RTOS) requirements are covered. Topics include message queuing, resource sharing, priority assignments, event flags, interrupts, memory allocation, and typical RTOS configurations. Examples in engineering and networking will be discussed. A significant implementation Design and implementation project will be undertaken.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: ENGM 2282.03

EXCLUSION: EE5810

ECED 3500.03: Signal Analysis.

This class has three parts. The first is complex analysis, including the residue theorem and its applications. The second part concerns transform theory including Fourier Series, Fourier Transform the frequency domain representation of signals, impulse response, and transfer function. The third part concerns partial differential equations including the classification of equations and boundary conditions, separation of variables, the wave equation, Laplace's equation, and applications to electrical engineering problems.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: ENGM 2021.03, ENGM 2041.03 and ENGM 2262.03

CROSS-LISTING: ENGM 3271.03

EXCLUSION: EE4510

ECED 3501.03: Analog Communications.

This class is concerned with techniques for communicating using continuous time/continuous amplitude signals. The spectra of useful functions are reviewed. Then, the principles of analog communications are covered, including amplitude, frequency, and phase modulation and demodulation techniques, their implementation, the performance of these techniques in noise, the principle of operation of a phase locked loop, and the principle of frequency division multiplexing. Standard AM and FM radio and TV signals are discussed.

FORMAT: Lecture 3 hours, lab 2 hours
PREREQUISITES: ECED 3500.03
EXCLUSION: EE4521

ECED 3502.03: Introduction to Signal Processing.

This class introduces the basics of filtering and analysis of discrete time signals and systems. The synthesis and implementation of analog filters is discussed. An overview of the sampling theorem is followed by a discussion of the discrete Fourier transform and the z-transform. The analysis of discrete time signals is introduced, and synthesis of digital filters is covered. Contemporary signal processing hardware and design software is introduced.

FORMAT: Lecture 3 hours, Lab 2 hours
PREREQUISITES: ECED 3500.03

ECED 3800.03: Electrical Materials.

This class deals with the understanding and application of electronic materials used by electrical engineers. The class will begin by introducing Schrodinger's equation in context with understanding the electronic transport properties of semiconductor and metals. The concept of holes, effective mass, polarization, optical absorption, dielectric breakdown, and lasers will be developed. The properties and characteristics of pn junctions, dielectrics, magnetic materials, optical materials, and pn light detectors will be introduced.

FORMAT: Lecture 3 hours

ECED 3901.03: Electrical Engineering Design II.

This class covers advanced aspects of design, interdisciplinary design and failure analysis. Students gain experience in the design of complex systems. The class culminates in a design contest in which groups of students design and implement a system to meet design objectives, and present and defend their design in an oral design review. The class will consist of both classroom and lab work. The classroom component will use case studies, design reviews and conventional lectures. The lab component is devoted to the design and implementation of a solution to the contest challenge.

FORMAT: Lecture 2 hours, lab 3 hours
PREREQUISITES: ECED 2900.03

ECED 4204.03: Microprocessors.

This class will present an overview of currently available microprocessors and microcontrollers. Topics include I/O methods and I/O devices (programmable I/O, priority/vectored interrupts, DMA), coprocessors, and A/D's and D/A's. Development of microprocessor systems is covered (memory allocation, I/O allocation, software development, debugging, and system integration).

FORMAT: Lecture 3 hours, lab 3 hours
PREREQUISITES: ECED 2200.03
EXCLUSION: EE4212

ECED 4301.03: Waves & Propagation.

This class presents the basic theory and applications of propagation of electromagnetic waves. Major topics include: time-varying Maxwell's equations, electromotive force, electromagnetic spectrum, transmission of plane waves, reflection and refraction, polarization, radiation, transmission line theory, standing wave ratio, Smith Chart, impedance matching, guided wave structures, modes and cut-off frequencies.

FORMAT: Lecture 3 hours, lab 2 hours
PREREQUISITES: ECED 3300.03

ECED 4403.03: Computer Architecture.

This class deals with controllers, processor instruction sets, and memory systems. The student will study design methods, implementation techniques, modelling techniques, and performance analysis. Reduced instruction set architectures (RISC), pipelining, pipeline hazards, and their implementation for modern high speed applications will be studied. The student project will require a team to design and implement (or simulate) a RISC architecture.

FORMAT: Lecture 3 hours, lab 2 hours
PREREQUISITES: ECED 4204.03
EXCLUSION: EE4420

ECED 4404.03: Computer Networks & Communications.

Network architecture and topology, ISO, physical and data link layers, LANS, ATM, routing, quality of service, and emerging technologies. The laboratory and assignments will require implementation of network software and evaluation of current technologies.

FORMAT: Lecture 3 hours, lab 2 hours
PREREQUISITES: ECED 4503.03, CS 3120.03

ECED 4503.03: Digital Communications:

This class extends the communication techniques introduced for analog signals to discrete time signals. First, digital representation of analog signals is considered, including pulse amplitude, width, and position modulation. Pulse code modulation, delta modulation, and associated adaptive and differential techniques are also considered. Then the principles of digital signal transmission are discussed, including consideration of amplitude, frequency, and phase shift keying techniques. The implementation of these techniques and their performance in noise are discussed. The principle of time division multiplexing is introduced, and an overview of current digital telecommunication standards is given.

FORMAT: Lecture 3 hours, lab 3 hours
PREREQUISITES: ECED 3501.03

ECED 4600.03: Modern Controls.

This class deals with control systems analysis and design aspects. Techniques for analyzing the performance of analog systems are introduced. Emphasis is on the use of the Laplace transform and state space techniques in evaluating system performance indicators including its stability. Tools introduced include frequency response methods, and the root locus. Practical examples involving design of controllers for small systems to achieve desired response are discussed.

FORMAT: Lecture 3 hours, lab 2 hours
PREREQUISITES: ECED 3003.03

ECED 4601.03: Digital Control Systems.

This class deals with digital control systems analysis and design aspects. Techniques for analyzing the performance of sampled data systems are introduced. Emphasis is on the use of the Z-transform in evaluating system performance indicators including its stability. Tools introduced include frequency response methods, and the root locus. Practical examples involving design of controllers for digital control systems to achieve desired response are discussed.

FORMAT: Lecture 3 hours, lab 2 hours
PREREQUISITES: ECED 4600.03
EXCLUSION: EE5661

ECED 4902.03: Senior Year Project.

Senior year students will be required to select a thesis topic and prepare a proposal, including a work program, for a project to be undertaken under the supervision of a faculty member and an industrial advisor. Preliminary work on the project may take place Term 7, but the bulk of the project will be completed in Term 8. Projects may include laboratory or field experiments, design problems, or literature reviews. The student will be expected to produce a typewritten report.

FORMAT: Lab 5 hours
EXCLUSION:

IV. Technical Electives

5th YEAR ONLY OF THE 5-YEAR PROGRAMME

Fall Academic Term

ECED 4071.03: Analog Filter Design.

This class deals with the theory and design of active filters, for audio-frequency applications, using op amps. It consists, basically, of two phases. Phase I deals with the realization of a given transfer function using cascade of first and/or second-order RC-op amps circuits. In phase II, the transfer functions of filters are studied in combination with frequency-response approximations such as Butterworth, Chebyshev, Inverse-Chebyshev, Caver (or Elliptic) and Bessel-Thompson. The design of Monolithic MOS switched-capacitor filters is also introduced.

FORMAT: Lecture 3 hours, lab 2 hours
EXCLUSION: EE5071

ECED 4130.03: Electric Power Systems II.

Analysis of Interconnected Systems, Power Flow problem, and iterative methods for its solution. Power System Protection, Power System Stability, Optimal Operation of Electric Power Systems.

FORMAT: Lecture 3 hours, lab 2 hours
EXCLUSION: EE5130

ECED 4260.03: IC Design and Fabrication.

The theory of operation of MOS transistors is reviewed. Processing technologies such as diffusion, ion implantation, and etching are presented with an emphasis on CMOS circuit fabrication. Electrical and physical characteristics of circuits and clocking and I/O structures are studied. Subsystem design of PLA's, adders, counters, ROM, and RAM will be examined. Extensive use of CAD tools will give the student hands-on experience with systems typical of those used in industry.

FORMAT: Lecture 3 hours, lab 2 hours
EXCLUSION: EE5260

ECED 4350.03: Optical Electronics.

This class deals with the fundamentals of generation and detection of light in semiconductor materials as they pertain to optoelectronic devices such as light emitting diodes, laser diodes, photo detectors, and optocouplers. Major topics include: review of semiconductor properties; photo detectors such as PIN photodiodes and avalanche photodiodes (APDS); spontaneous emission and injection luminescence in light emitting diodes (LEDs); and stimulated emission and optical gain in laser diodes (LDS). Typical materials, structures, characteristics and parameters of these devices are discussed with relation to various applications.

FORMAT: Lecture 3 hours, lab 2 hours
PREREQUISITES: Year III and Year IV classes
EXCLUSION: EE5350

ECED 4424.03: System Analysis and System Design for Engineers.

This class covers the fundamentals of system analysis and design for hardware/software systems. Hardware and software trade-offs to meet system timing and cost constraints are covered. The students learn how to analyze complex systems using modern analysis techniques. Class, state transition, interaction, process, and object diagrams are covered. Principles of management, quality assurance, and documentation as they apply to software systems are introduced. Representative applications employing the techniques taught in the class are studied.

FORMAT: Lecture 3 hours, lab 2 hours
PREREQUISITES: Software Engineering
EXCLUSION: EE5424

ECED 4460.03: Communications Electronics.

This class provides an introduction to the theory and design of electronic circuits for communications systems. Topics include: the realization of passive components for high frequency applications; small signal amplifier design and characterization employing s-parameter techniques; large signal circuit design realization and

analysis employing volterra series and harmonic balance nonlinear analysis procedure; the realization and characterization of nonlinear circuits as high efficiency power amplifiers, oscillators, frequency converters, and modulator/demodulator subsystems; the integration of appropriate subsystems into analog and digital terrestrial and space borne radio communication systems.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: EE4321

EXCLUSION: EE5460

ECED 4530.03: Digital Communications I.

Baseband Digital Transmission - Probability of error in binary systems: basic technique of calculation, threshold, SNR, optimum threshold for binary detection. Optimum receiver - Matched Filter and Correlation Receiver: derivation of the MF, colored and white noise, P_e with MF; realizability of MF, intersymbol interference (ISI), the optimum binary receiver, suboptimum linear filters. ISI and pulse shaping: Nyquist's first criterion, partial response signalling - Nyquist's second criterion, optimum transmitting and receiving filters, eye diagram; Equalization: zero-forcing equalizer, analytical analysis; M-ary baseband signalling, comparison-binary versus M-ary signalling.

Digital Modulation (Bandpass) Systems: Introduction: block-diagram, definitions of bandwidth, band-limited and power-limited channels, spectra of digitally modulated signals; binary ASK; Binary PSK, differentially encoded PSK and differentially coherent PSK; Binary FSK (CP FSK, coherent and noncoherent, demodulation, comparison of binary digital modulation systems. M-ary signalling: encoding for M-ary transmission, signal space and signal constellation, spectral efficiency; Quadrature multiplexed signals (QAM) and APK: two-dimensional signal constellations, modulator and demodulator, performance; M-ary PSK; Offset Q PSK; MSK; QPRK.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: EE5530

ECED 4610.03: Control Engineering I.

Linear systems theory and analytic techniques are applied to feedback control systems. Root-locus and Bode diagrams are used for analysis and for compensation design procedures. System sensitivity is analyzed in both d.c. and carrier control systems. State variable procedures are used for both analysis and for computer modelling design. The class ends with an introduction of linear optimal control and non-linear systems.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: EE5610

Winter Academic Term

ECED 4081.03: Sampled-Data and Digital Filters Design.

This class deals with the theory and design of sampled data and digital filters. It consists of two parts. Part I is devoted to the study of sampled-data filters, in particular the switched-capacitor (sc) filters. It covers exact analysis and design techniques of SC filters using the transformation. Part II deals with the theory and design of digital filters. It covers topics such as: design techniques of recursive digital filters (the impulse response method, matched Z-transformation, bilinear transformation, and digital filter transformation) and design techniques of nonrecursive digital filters (using the Fourier-series approach, the window functions and design based on numerical analysis formulas).

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: EE5081

ECED 4140.03: Power Systems III.

The class covers topics such as load curves and forecasting, characteristics and peak demand forecasting, weather-load models, discounted multiple regression and ARMA models, introduction to power system reliability evaluation, generating capacity reserve evaluation, contingency evaluation and an introduction to long-range power system expansion planning packages and production costing.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: EE5140

ECED 4170.03: Power Electronics.

Introduction to Power Semiconductor Devices and Systems, SCR and its characteristics, commutation and commutation circuits. Power Electronic Systems, voltage controllers, controlled rectifiers, D.C. Choppers, inverters. D.C. Motors operating characteristics. Introduction Motors operating characteristics. Adjustable Speed Drives: Induction motor speed control, D.C. motor speed control. EXCLUSION: EE5170

ECED 4180.03: Electrical Machines.

The general theory of electrical machines is developed from dynamic circuit concepts. Linear transformations used in machine analysis are derived. The matrix equations of basic rotating machines are examined. Application of matrix techniques to routine performance calculations is discussed. The general theory is used to study the steady state and transient performance of commutator machines, induction machines and synchronous machines.

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITES: Electromechanics

EXCLUSION: EE5180

ECED 4250.03: Electronic System Design.

The theory of operation and characteristics of sensors are studied. Noise sources, shielding, grounding, and impedance matching are discussed. Radio frequency amplifiers, mixers, filters and oscillators will be studied. Both analogue and digital signal conditioning techniques are covered including noise figure, unit conversion, control loop implementation. Phase-locked loops (PLL) are studied.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: EE5250

ECED 4360.03: Antenna Theory and Design.

This course is concerned with the basic theory and design of antennas. Major topics include: potential wave equations and solutions, the concept of retarded potentials, radiation from a current element and a half-wave antenna, fundamental parameters of antennas, impedance matching and methods of excitation, antenna arrays and signal processing antennas, induction and equivalence theorems, horn and slot antennas, antenna design and measurement.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: EE4310

EXCLUSION: EE5360

ECED 4421.03: Technology and Applications of Fiber Optics.

This class deals with the basic principles and applications of optical fiber communications. Major topics include: ray theory and electromagnetic modes in optical fiber waveguides; step-index and graded-index multimode and single-mode fibers; transmission characteristics of optical fibers such as attenuation (absorption, scattering, bending), dispersion (multipath, waveguide, material, profile), and polarization (random, preserved); optical fiber communication systems (transmitter, receiver, digital and analog system design); advanced systems; non-communications applications.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: Year III and Year IV classes

EXCLUSION: EE5421

ECED 4540.03: Digital Communications II.

This class will cover the following: Information Theory and Coding: The concept of information, coding for a discrete memory less source, discrete communication channels, discrete memory less channel capacity, channel coding and Shannon's Second Theorem, continuous AWGN channels and Shannon-Hartley Theorem, block coding, convolutional codes, line codes.

Digital Transmission of Analog Signals: PCM signals, delta modulation (DM) and differential PCM (DPCM), noise in PCM and DM systems, comparison of PCM and DM systems, time division multiplexing (TDM) and PCM hierarchy, T-carrier systems, regenerative repeaters, low-bit rate encoding techniques.

Practical Communications Systems: Principles of TV and colour TV, principles of telephony, principles of land mobile radio communications, satellite communication systems, new digital services.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: EE5540

ECED 4661.03: Digital Control Systems.

This class deals with the use of digital computers in real-time control of dynamic systems. Discrete and sampled-data system analysis are introduced, along with the relationship between the Z-transform and the Laplace transform. Emphasis is on the design of digital controls to achieve desired dynamic response. Principal methods discussed include root locus, Bode and w-plane. Some State-space methods are also discussed.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: EE5661

ECED 4760.03: Biomedical Engineering.

Basic anatomy and physiology of the cardiovascular, respiratory and neurophysiological systems, and their contemporary mathematical and electrical models. Physiological transducers and data acquisition systems. Biophysical signal conditioning and processing. Biotelemetry. The computer in biomedical instrumentation. Electrical safety of medical equipment. Guest lectures in the areas of electrocardiography, echocardiography, respiratory technology, hospital engineering and neurophysiological measurements.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: EE5760

ECED 4810.03: Real Time Systems.

The following topics will be covered: Concurrent processes, inter-process synchronization and communication, concurrent programming, interrupts and device drivers, and structured development methodology. Application areas include process control, digital signal processing, and data communications.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: EE5810

Engineering Mathematics

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I. Introduction

The Department provides the Applied Mathematics classes required to support the engineering programmes offered by the other departments. It also provides a specialized graduate programme in Engineering Mathematics with several specializations offered with the co-operation of Engineering Departments and the Faculty of Computer Science.

The technical subjects offered by the Engineering Departments depend upon a sound knowledge of mathematical principles. Classes in Engineering Mathematics are therefore offered to students in each of the Engineering Departments. Emphasis is placed on the application of mathematical techniques to the description and solution of engineering problems. The lectures are supplemented by tutorial sessions and, when appropriate, are illustrated by application of techniques that require use of the available computing facilities.

II. Classes Offered

ENGM 1011.03: Engineering Mathematics I.

This class covers functions, limits, continuity, differentiation and integration of polynomials, exponential, logarithmic and trigonometric functions, product, quotient and chain rules applications of differentiation to graphing, maximum-minimum problems and related rate problems, definite and indefinite integrals, and the fundamental theorem of Calculus.
FORMAT: Lecture 3 hours, lab 2 hours

ENGM 1012.03: Engineering Mathematics II.

This class covers applications of integration including areas, volumes, moments, pressure and work, techniques of integration, numerical integration, length of curves, surfaces of revolution, parametric equations, polar coordinates, sequences and series, and Taylor series.
FORMAT: Lecture 3 hours, lab 2 hours
PREREQUISITE: ENGM 1011.03

ENGM 2021.03: Engineering Mathematics III.

This class covers first order linear and non-linear differential equations, differential equations of higher order with constant coefficients, applications to Engineering problems, power series solutions, Laplace transforms, periodic functions, applications of Laplace transforms to linear systems, Fourier Series, the line spectrum.
FORMAT: Lecture 3 hours, lab 2 hours
EXCLUSION: MATH 3110.03, MATH 3120.03
PREREQUISITES: ENGM 1011.03 and ENGM 1012.03

ENGM 2032.03: Applied Probability and Statistics.

The topics covered include probability laws and the interpretation of numerical data, probability distributions and probability densities, functions of random variables, joint distributions, characteristic functions, inferences concerning mean and variance, tests of hypotheses, and introduction to linear regression. The class emphasizes engineering applications and makes extensive use of statistical computer packages.
FORMAT: Lecture 3 hours, lab 2 hours
EXCLUSION: MATH 2060.03, MATH 2080.03
PREREQUISITES: ENGM 1011.03 and ENGM 1012.03

ENGM 2041.03: Applied Linear Algebra.

This class covers geometric vectors in three dimensions, dot product, cross product, lines and planes, complex numbers, systems of linear equations, matrix algebra, matrix inverse, determinants, Cramer's rule, introduction to vector spaces, linear independence and bases, rank, linear transformations, orthogonality and applications, Gram-Schmidt algorithm, eigenvalues and eigenvectors.
FORMAT: Lecture 3 hours, lab 2 hours
PREREQUISITES: ENGM 1011.03 and ENGM 1012.03

ENGM 2062.03: Engineering Mathematics IVa.

This class covers geometric vectors in three dimensions, dot product, cross product, lines and planes, complex numbers, systems of linear equations, matrix algebra, matrix inverse, rank, determinants, Cramer's rule, space curves, arclength, curvature, functions of several variables, partial derivatives, implicit functions, constrained and unconstrained extrema, multiple integrals, surface area and volume, scalar and vector fields, line integrals, gradient, divergence and curl.
FORMAT: Lecture 4 hours, lab 1 hour
EXCLUSION: MATH 2480.03, MATH 2490.03
PREREQUISITES: ENGM 1011.03 and ENGM 1012.03

ENGM 2081.03: Computer Programming.

This class covers fundamental programming principles including flow control, modularity, and structured programming. The student will implement significant programs in the C language to solve engineering problems.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ENGI 2240.03

PREREQUISITES: ENGM 1011.03 and ENGM 1012.03

ENGM 2262.03: Engineering Mathematics IVb.

This class covers space curves, arclength, curvature, functions of several variables, partial derivatives, implicit functions, constrained and unconstrained extrema, multiple integrals, line, surface, and volume integrals, change of variables in multiple integrals, scalar and vector fields, gradient, divergence and curl, Stokes Theorem, the Divergence Theorem, and applications to heat flow, electrostatics and fluid flow.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MATH 2480.03, 2490.03

PREREQUISITES: ENGM 1011.03 and ENGM 1012.03

ENGM 2282.03: Data Structures and Numerical Methods.

This class introduces the student to system analysis, and software techniques. Topics covered include objects, stacks, queues, multiple linked lists, searching and sorting algorithms, and their implementation in the C++ programming language. The students use linear algebra and numerical methods in engineering examples while learning to implement properly structured solutions.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: ENGM 2081.03 and ENGM 2041.03

ENGM 3052.03: Applied Numerical Methods.

This class provides an introduction to Numerical Analysis with emphasis on solution of Engineering problems. The class covers the following topics: a brief review of FORTRAN; concepts of software engineering; approximations and errors; roots of linear and non-linear equations; LU decomposition, Singular value decomposition, condition number; curve fitting; numerical differentiation and integration; and numerical solution of ordinary differential equations.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: ENGM 2021.03 and ENGM 2062.03

EXCLUSION: AM3652

ENGM 3271.03: Engineering Mathematics V.

This class has three parts. The first is complex analysis, including the residue theorem and its applications. The second part concerns transform theory including Fourier Series, Fourier Transform, the frequency domain representation of signals, impulse response, and transfer function. The third part concerns partial differential equations including the classification of equations and boundary conditions, separation of variables, the wave equation, Laplace's equation, and applications to electrical engineering problems.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: ENGM 2021.03, ENGM 2041.03 and ENGM 2262.03

CROSS-LISTING: ECED 3500.03

ENGM 3352.03: Numerical Methods and Linear Algebra.

This class provides an introduction to Numerical Analysis and Linear Algebra with emphasis on solution of problems related to Mechanical Engineering. The following topics are covered: a review of FORTRAN; concepts of software engineering; approximations and errors; roots of non-linear equations; matrix algebra, vector spaces and systems of equations, numerical solution of systems of equations, LU decomposition, Singular Value Decomposition, condition number; curve fitting; numerical integration and differentiation; and numerical solution of ordinary differential equations.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITE: ENGM 2021.03

EXCLUSION: AM3352

ENGM 3361.03: Engineering Mathematics IVc.

This class covers space curves, arclength, curvature, functions of several variables, partial derivatives, implicit functions, constrained and unconstrained extrema, multiple integrals, line, surface, and volume integrals, scalar and vector fields, gradient, divergence and curl, Stokes Theorem, the Divergence Theorem, and applications to heat flow and fluid flow, boundary value problems, partial differential equations, separation of variables, solution of the heat equation, wave equation, and Laplace's equation with various boundary conditions.

FORMAT: Lecture 4 hours, lab 1 hour

PREREQUISITE: ENGM 2021.03

Industrial Engineering

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I. Introduction

Industrial Engineers design systems to enable people and society to improve productivity, efficiency, effectiveness and the quality of the work environment. All engineers work at planning, designing, implementing and controlling the systems that represent the way people use technology. The systems that are the subject of Industrial Engineering design are broad and are characterized by a need to integrate both the physical and decision making capabilities of humans together with all other aspects of the system design. Problems range from the design of a work method and work station, to the design of a factory layout and methods of controlling the flow of materials on the factory floor, to the design of an overall corporate plan involving materials procurement, production, inventory and distribution. The idea of a factory is also extended to include health care systems, municipal systems, transportation systems; in fact all the systems that are essential to the functioning of modern society. Systems that facilitate effective decision making and implementation in areas such as scheduling, inventory, and quality control are typical of industrial engineering.

Human behaviour and capabilities are key element in the systems Industrial Engineers work with. In designing the layout of a production line for an automobile manufacturer, the checkout counter for a supermarket, the organization of office work flow for a bank or the materials handling system for a steel plant, the engineer

must consider both physical requirements and cost parameters and the physiological and behavioral performance of the human operators. The Industrial Engineer has a dual role, both to extend human capability to operate, manage and control the overall production system and to ensure the safety and well being of those working in the system.

Design and development of these systems requires the unique background of the Industrial Engineer. The process of engineering always starts with measurement. Where other engineers might measure temperatures, pressures or wind loads, the Industrial Engineer measures the time of a work cycle, dollar values of expenditures, rates of machine failures, and demand processes for finished goods. Usually the mathematical analysis must take into account risk and uncertainty to a larger extent than in other engineering fields. Computer simulation and optimization are often required. The concepts and techniques found in the Industrial Engineering curriculum have been selected to assist the student to develop the skills that meet the specific challenges of systems which involve managerial activities.

Students begin the Industrial Engineering program with a background in engineering fundamentals studied during their initial two years. In the DalTech portion of the IE program, they are introduced to the fundamental approaches of work place design and operations research while at the same time being required to enhance their mathematical and computer background. Later more advanced modeling approaches are examined together with courses more directly related to the management process. Production scheduling, inventory control, quality management and plant layout are studied as are the factors which influence human performance. Students are provided with the opportunity to take extra courses related to such areas as manufacturing, computer science, or management science through the Department's elective course offerings.

In their final year all students undertake a major project. Projects are drawn from companies or institutions outside the University and are treated as a consulting assignment. The students are evaluated based upon their ability to achieve an innovative solution by drawing upon the analytical skills developed throughout their program of studies. They must also, of course, satisfy the practical requirements of the outside client.

Job opportunities for Industrial Engineers are both challenging and widely based. Former graduates are currently practicing Industrial Engineering in all types of work activity ranging from paper product manufacturing, to airlines, to utilities, to hospitals. Invariably, the work assigned is original in its nature demanding that the Industrial Engineer to be creative in applying his or her many abilities to achieve the best solution. Managers require such results if they are to keep their costs under control in this increasingly competitive world. This requirement should sustain the high demand for Industrial Engineers well into the future.

II. Co-op Programme

The Industrial Engineering Department is strongly committed to our co-op program. This incorporates three work terms taken alternately with study terms until the final two terms of the senior year. The Faculty works closely with the University's co-op office to secure work term positions for the students. While no guarantees are possible, our goal is 100% placement of our students, a goal that we have achieved for qualified students who actively participate in the job seeking process. A wide variety of work term placements have been available ranging from smaller sized local companies to larger national corporations.

Students not wishing to participate in the co-op programme are able to structure their academic program over a two year time period. To do so requires the student to begin the program at the beginning of the study term which commences the first week of May. This term, which is the second study term of the co-op program, is followed by the fall and winter study terms. After the normal summer term break these students would complete the final two study terms in the same fashion as students in the co-op program thus completing their five (5) study or academic terms within two calendar years.

Students who have successfully completed the requirements for the degree of Bachelor of Engineering and who, in addition, have accumulated 1400 hours or more of approved work experience, will receive the "Co-op Program" designation on their degree.

A. CO-Op Schedule

Yr/Term	Fall	Winter	Summer
Year 1	AT1	AT2	FREE
Year 2	AT3	AT4	FREE
Year 3	AT5	WT6	AT7
Year 4	WT8	AT9	WT10
Year 5	AT11	AT12	

B. Programme Guide

NOTE: The following curriculum pertains to incoming students only. Students already in the programme continue to follow their original curriculum.

Year 1 follows the common programme outlined in the Engineering section of this calendar.

Year 2, Term 3 (Fall)

- ENGM 2021.03 Engineering Mathematics III
- ENGM 2081.03 Computer Programming
- ENGI 2800.03 Engineering Thermodynamics I
- ECED 2000.03 Electric Circuits
- ENGI 2200.03 Mechanics of Materials
- Humanities I

Year 2, Term 4 (Winter)

- MECH 2100.03 Engineering Design and Graphics II
- ENGM 2032.03 Applied Probability & Statistics
- ENGI 2300.03 Fluid Mechanics OR
- ENGI 2400.03 Mechanics II
- Humanities Class
- ENGM 2062.03 Engineering Math IV(a) OR
- ENGM 2262.03 Engineering Math IV (b)
- IENG 2000.03 Engineering Economics

Please see appropriate department for a description of Year 2 classes.

NOTE: Students who take the Industrial Engineering programme are not required to take the two humanities classes in Year 2. However, students are advised to take these to preserve their ability to transfer to other departments after Year 2.

Year 3, Term 5 (Fall)

- IENG 3311.03 Modelling and Design of Industrial Systems
- IENG 3316.03 Design of Information Management Systems
- IENG 3342.03 Operations Research I
- IENG 3305.03 Computational Methods and Algorithms for IE
- IENG 3313.03 Analysis and Design of Work

Year 3, Term 6 (Winter)

- Work Term I

Year 3, Term 7 (Summer)

- IENG 3315.03 Accounting
- IENG 3334.03 Industrial Statistics
- IENG 3333.03 Operations Research II
- IENG 3321.03 Manufacturing Processes and Materials
- IENG 3338.03 Ergonomic and Safety Engineering

Year 4, Term 8 (Fall)

- Work Term II

Year 4, Term 9 (Winter)

- IENG 3432.03 Simulation of Industrial Systems
- IENG 3445.03 Facilities Design
- IENG 3443.03 Quality Control and Reliability
- MECH4330.03 Mechanical Design

- IENG 3452.03 Design of Inventory and Production Systems

Year 4, Term 10 (Summer)

- Work Term III

Year 5, Term 11 (Fall)

- IENG 4541.03 Industrial Engineering Design Project I
- IENG 4529.03 Industrial and Organizational Psychology
- IENG 4548.03 Systems Engineering
- IE Electives
- IE Electives

Year 5, Term 12 (Winter)

- IENG 4551.03 Industrial Engineering Design Project II
- IENG 4547.03 Company Operations and Management
- Complementary Studies
- 2 IE Electives

C. Industrial Engineering Electives

- IENG 4571.03 Computer Integrated Manufacturing Systems
- IENG 4574.03 Decision and Risk Analysis
- IENG 4564.03 Design and Optimization of Service Systems
- IENG 4573.03 Industrial Biomechanics
- IENG 4562.03 Maintenance Engineering and Management
- IENG 4578.03 Organizational Aspects of Quality Management
- IENG 4558.03 Project Management and Control
- IENG 4544.03 Routing and Scheduling
- IENG 4575.03 Stochastic Processes and Queueing

III. Class Descriptions

IENG 2000.03: Engineering Economics.

This class is designed to provide students with the fundamentals of Engineering Economics. Engineers must function as managers in the real world of decision making where the criteria include not only technological excellence, but cost. Time value of money, project screening, and a variety of discounting analysis techniques are learned. We must know when to repair or when to replace, when to make and when to buy. Taxes and inflation can also have significant impact on the viability of projects. This class is designed to introduce students to these fundamentals, and apply them through the use of software and projects.

EXCLUSION: IE0718

IENG 3305.03: Computational Methods and Algorithms for IE.

An overview of advanced programming methods is presented with an introduction to algorithms used in industrial engineering applications. Topics covered include sorting, searching, data structures, shortest paths, random number generation, simulated annealing, matrix operations, curve fitting and geometric algorithms. Algorithms for solving several classes of equations are considered. Techniques for writing and debugging large programs, and controlling numerical errors are taught. The C programming language will be used for implementation.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: ENGM 2081.03

IENG 3311.03: Modelling and Design of Industrial Systems.

This class introduces students to the modelling and design of industrial systems. The history, development and theoretical basis of industrial engineering will be discussed. A broad cross section of industrial engineering techniques for designing, modelling or analyzing production processes will be presented. Specific topics include manufacturing planning, work place design and

ergonomics, operations management, project planning, and operations research. Students will submit a project which uses IE techniques to analyze and improve an existing production process.
FORMAT: Lecture 3 hours, lab 2 hours
EXCLUSION: IE0711

IENG 3313.03: Analysis and Design of Work.

A comprehensive approach to work analysis and design is pursued through the application of classical industrial engineering, ergonomics, safety and behavioral science concepts. The course will deal with work design/redesign concepts, models and application. The course includes ergonomic workstation and tool design, graphical techniques of work methods analysis, operations analysis, time study, performance rating, allowances, predetermined time standards, work sampling, indirect labour standards, computerized work measurement, job evaluation and wage payments.
FORMAT: Lecture 3 hours, lab 3 hours
EXCLUSION: IE0713
PREREQUISITES: ENGM 2032.03

IENG 3315.03: Accounting.

This class deals with the principles of financial and managerial accounting. Students are exposed to accounting theory and the manner in which the accounting system integrates with the overall functioning of an organization. Attention is given to the build-up of accounting data within the system and the preparation of financial statements. Considerable time is devoted to the use accounting data by management as a means of anticipating the effect of changes on future operations.
FORMAT: Lecture 3 hours
EXCLUSION: IE0915

IENG 3316.03: Design of Information Management Systems.

Techniques used in the design of information management systems to support decision making are taught. This includes the principles of systems analysis, software engineering and requirements analysis. The design of relational database systems, user interfaces and documentation are covered. Current technologies for computer hardware, software, networking and communications are reviewed. Students are taught how to program database applications in a fourth generation environment. Software development projects will be assigned.
FORMAT: Lecture 3 hours, lab 2 hours
EXCLUSION: IE0716
PREREQUISITES: ENGM 2081.03

IENG 3321.03: Manufacturing Processes and Materials.

The class deals with properties of manufacturing materials, casting and forming, traditional and non-traditional machining processes, welding and computer-integrated manufacturing (CIM). Theoretical background is provided that includes equilibrium diagrams, heat treatment, tool life and wear, and dimensioning and tolerance analysis. There will be lab experiments, video presentations and manufacturing plant visits.
FORMAT: Lecture 3 hours, lab 2 hours
EXCLUSION: IE0921

IENG 3333.03: Operations Research II.

The class consists of an analysis of important probabilistic and nonlinear models in Operational Research. These include dynamic programming, queuing models and reliability models. Aspects of Markov processes and nonlinear programming are introduced. Application of these methods is reinforced through a term project.
FORMAT: Lecture 3 hours, lab 2 hours
EXCLUSION: IE1133
PREREQUISITES: ENGM 2032.03

IENG 3334.03: Industrial Statistics.

This class covers hypothesis testing, chi-square tests and nonparametric techniques, analysis of variance and experimental design, as well as simple and multiple linear regression. Numerical examples are solved by straightforward calculation as well as by

computer software, and various applications are presented. Time series and forecasting techniques are taught. A project concerns the building and testing of a multiple linear regression model.
FORMAT: Lecture 3 hours, lab 2 hours
EXCLUSION: IE1134
PREREQUISITES: ENGM 2032.03

IENG 3338.03: Ergonomic and Safety Engineering.

This class deals with those aspects of the design and use of machines which are influenced by the human operator. The ways of designing human/machine systems, displays, controls, the workplace, manual materials handling systems, hand tools and the work environment are considered so as to match functionality with human capabilities and limitations. An extensive lab project is performed using instrumentation facilities. A design project is undertaken applying principles of ergonomics and safety engineering.
FORMAT: Lecture 3 hours, lab 2 hours
EXCLUSION: IE1138

IENG 3342.03: Operations Research I.

This class is an introduction to linear programming and its applications to industrial engineering design. The simplex method and duality theory are covered in detail. Formulation, solution algorithms, and applications of several problem classes are presented including network models and integer programs. Through a course project, students are introduced to the process of developing an optimization model, including the ideas of database, matrix generators, and report writers.
FORMAT: Lecture 3 hours, lab 3 hours
EXCLUSION: IE0942

IENG 3432.03: Simulation of Industrial Systems.

This class covers discrete event systems simulation. Model development includes validation and verification methods, the generation of pseudo-random numbers from continuous and discrete distributions, selection of probability distributions and variance reduction techniques. Statistical output analysis and inference are studied for effective interpretation of results. Applications in areas such as manufacturing, service operations, project management and system design are reviewed. Simulation software is used throughout the course.
FORMAT: Lecture 3 hours, lab 2 hours
EXCLUSION: IE1132
PREREQUISITES: ENGM 2032.03, IENG 3305.03

IENG 3443.03: Quality Control and Reliability.

This class deals with aspects of production to ensure that products meet specifications. Statistical quality control, which is used to determine process capability and to detect process changes, covers the design and use of different types of control charts. Sampling inspection, which is used to separate good lots from poor lots, covers the design of sampling plans. Reliability is concerned with the design of products and reliability testing.
FORMAT: Lecture 3 hours, lab 2 hours
EXCLUSION: IE1343
PREREQUISITES: ENGM 2032.03, IENG 3334.03

IENG 3445.03: Facilities Design.

This class deals with the principles, concepts and methods of plant layout and materials handling for the optimum design of a facility. The topics include information requirements for facility design, conventional and newer quantitative techniques for analyzing material flow, facilities location, space determination, computerized plant layout techniques, the unit load concept, materials handling equipment selection and automatic storage and retrieval systems. A project involves facilities design for the manufacture and assembly of a mechanical device.
FORMAT: Lecture 3 hours, lab 2 hours
EXCLUSION: IE1345

IENG 3452.03: Design of Inventory and Production Systems.

This class introduces a number of quantitative methods for the analysis and improvement of productivity of modern manufacturing. Focusing on inventory control in production, various static and dynamic production planning models are considered. These include deterministic and probabilistic economic order quantity (EOQ) models and variants, single and multiple period inventory models, material requirements planning (MRP) and production lot sizing, just-in-time (JIT) models, and other advanced production and inventory models. Forecasting algorithms applicable to production systems are discussed.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: IE1352

PREREQUISITES: ENGM 2032.03, IENG 3342.03, IENG 3333.03

IENG 4529.03: Industrial and Organizational Psychology.

Individual behaviour and group processes are reviewed, particularly as they relate to activities in organizations. Perception, learning, motivation and attitudes are covered. The implications of different personality types at work are taught. Organizational issues such as group dynamics, communication, power and conflict are studied. Applications include job analysis, team effectiveness, personnel selection and training, job enrichment, leadership and career management.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: IE1429

IENG 4541.03: Industrial Engineering Design Project I.

In this class the students work in pairs on an actual industrial engineering design problem from an organization outside the university. The problem may be in a manufacturing plant, a consulting firm, or a service industry. The ability to solve problems and communicate with the client organizations and with professional Industrial Engineers is stressed. Students are required to maintain a professional log, to prepare an interim report and to demonstrate their presentation skills.

FORMAT: Lab 6 hours

EXCLUSION: IE1341

PREREQUISITES: Completion of all courses except those in the last two academic terms of the Industrial Engineering Program.

IENG 4544.03: Routing and Scheduling.

Optimization techniques for solving vehicle routing and scheduling problems are covered. Elementary concepts and notation for graphs, networks, maps and geographic information systems (GIS) are presented. Specific issues include NP-Complete problems, shortest paths and traveling salesperson problems. Vehicle routing and scheduling with capacity constraints, time windows, pick-up and delivery constraints are also discussed. Applications in manufacturing and transportation are reviewed.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: IENG 3305.03, IENG 3342.03

IENG 4547.03: Company Operations and Management

The purpose of this course is to introduce the student to the management and operation of large and small businesses. Topics include business environment in Canada, entrepreneur, small business startup and financing, organizational theory, management cycle, managing projects, human resources, industrial relations, management finance, marketing and sales. A term project is an integral part of this course.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: IE1347

IENG 4548.03: Systems Engineering.

This class places the industrial engineering viewpoint in the context of systems theory. The course begins with an introduction to the general concepts of systems, and then examines classical linear systems theory as applied traditionally in engineering. It is shown how industrial engineering design can be viewed as a control

system problem. The concepts of systems engineering are in turn applied to industrial engineering design. Systems dynamics simulation is used to explore these ideas.

Issues of capacity planning, hierarchical production planning and control, short term scheduling and data development analysis are presented.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: IE1448

PREREQUISITES: Only final year IE students eligible.

IENG 4551.03: Industrial Engineering Design Project II.

This class is a continuation of the earlier industrial engineering design project. The orientation leans heavily towards the application of more innovative solutions to the industrial problem already worked upon with the idea of making some worthwhile contribution to the advancement of the application of industrial techniques in the solution of real industrial problems. Successful completion of the course requires a high-caliber final report and oral presentation.

FORMAT: Lab 6 hours

EXCLUSION: IE1451

PREREQUISITES: IENG 4541.03

IENG 4558.03: Project Management and Control.

This class identifies the common aspects and peculiarities of projects and then illustrates the applications of analytical approaches to meet the challenges of achieving effective project management. The following topics are covered: feasibility studies, project planning, cost estimation, bidding, use of professional engineering and other types of consultants, organization and control, resource allocation and project life cycle concepts. The role of the professional engineer in society and the impact that engineering in all its forms makes on the environmental, social, economic and cultural aspirations of society are discussed.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: IE1458

IENG 4562.03: Maintenance Engineering and Management.

The course deals with basic maintenance systems of equipment and buildings, maintenance job planning and scheduling, maintenance work measurement/universal maintenance standard (UMS), breakdown versus preventive maintenance, total productive maintenance (TPM), budgets and cost control, computerized maintenance management information system, reliability measurement based on the Weibull distribution, maintainability measures and managing maintenance.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: ENGM 2031.03, IENG 2005.02

IENG 4564.03: Design and Optimization of Service Systems.

This class will focus on the design of systems in Canada's largest industry: health care. Throughout the course, examples drawn from health care will be used to illustrate how industrial engineering techniques can be applied in a wide variety of settings. Topics to be discussed include capacity planning, service distribution, quality, decision analysis, scheduling, and waiting line models.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: IENG 3311.03

IENG 4571.03: Computer Integrated Manufacturing Systems.

Techniques are introduced for the analysis and design of computer integrated manufacturing systems. The architecture of CIM systems is discussed, including machining stations, material handling, robotics, computer control and information systems. Specific topics include manufacturing simulation, automated material handling, warehouse management, robotics, manufacturing planning and control, just-in-time systems, group technology, cellular manufacturing, flexible manufacturing systems, concurrent engineering, computer aided process planning and information system design.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: IE1371

PREREQUISITES: IENG 3432.03

IENG 4573.03: Industrial Biomechanics.

The class primarily deals with the functioning of the structural elements of the human body and the effects of external and internal forces on the body. Due emphasis is given to the biomechanical approach to job design. This takes into account human motor capabilities and limitations, work physiology, task demands, equipment and workplace characteristics in an integrated manner. Use of bioinstrumentation and applications of biomechanics in work, industry and rehabilitation are discussed.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: IE1373

IENG 4574.03: Decision and Risk Analysis.

This class teaches the principles and applications of decision analysis. The cognitive processes involved with information acquisition, judgement, value assessment, and decision-making are presented. Methods for scoping a decision-making problem, decomposing it into elements, establishing criteria, and evaluating the options are discussed. Probability assessment under uncertainty, decision trees, value of information, utility theory, and multiple-agent contexts are explored to address increasingly complex scenarios.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: IE1474

PREREQUISITES: ENGM 2031.03, IENG 2005.02

IENG 4575.03: Stochastic Processes and Queuing.

This class covers the analysis of stochastic models. After a review of the relevant aspects of probability theory, the course examines discrete-time Markov chains, Poisson processes, continuous-time Markov chains, and renewal theory. The course also touches on applications of the theory to queuing, inventory, and reliability.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: IE1475

PREREQUISITES: ENGM 2031.03, IENG 3333.03

IENG 4578.03: Organizational Aspects of Quality Management.

In this class, quality is investigated as a strategic initiative for organizations. The concept of quality is described in relation to the philosophies of Shewart, Deming and Juran. The organizational structures needed to support Total Quality Management (TQM) programs are described. Tools for process analysis and improvement are discussed, as is the concept of change management. The course concludes with an evaluation of current quality certification protocols, particularly the ISO 9000 series of standards.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: IE1478

PREREQUISITES: IENG 3311.03, IENG 3443.03

Mechanical Engineering

Professors

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 Bell, A.C., BSc (Dal), BEng (TUNS), SM, ME, ScD (MIT), PEng, Dean of Engineering
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 Ugursal, V.L., BSc (Bogazici), MEng, PhD (TUNS), PEng
 Watts, K.C., BSA, MSc (Guelph), PhD (Wat), PEng, PAg, joint appointment with Biological Engineering

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I. Introduction

Mechanical Engineering covers a very broad field of professional activity in such areas as land, sea, air, and space transportation; primary and secondary manufacturing industries; power generation, utilization and control; environmental control; and industrial management. In these areas, the Mechanical Engineer may become involved with design, construction, operation, development, research, planning, sales and management.

The curriculum is designed to develop an understanding of the fundamental principles of Mechanical Engineering through lecture, tutorial, and laboratory activities. Modern well-instrumented laboratories in thermofluids, energy conversion, stress analysis, vibrations, and control systems provide experience in measurements

and applications to ensure a thorough understanding and appreciation of the subject matter. Classes in mathematics, engineering management and various non-technical subjects are offered to broaden the student's outlook and understanding of his profession.

Laboratory involvement is considered an important component of mechanical engineering students' education. Emphasis in the laboratory is placed on project work in which design, development and testing are combined in term projects. The laboratory facilities include extensive equipment which is available for use by both undergraduate and graduate students. Measurement techniques and interpretation of test data are emphasized in the laboratories which include several testing machines, photoelastic equipment and strain gage facilities. The control systems laboratories include hydraulic, pneumatic and electronic control systems and components. Several test cells are available for engine testing and a well instrumented, low turbulence wind tunnel is available. Modern laboratory facilities in vibrations, holography and acoustics are utilized for calibration, testing and research.

Most undergraduate laboratories use portable high-speed PC-based digital data acquisition and control systems with graphical interfaces for lab experiments and computations, and the Department has several advanced computer graphics systems.

A design project is an integral part of the senior year curriculum. This involves the student in the original design of a machine or system. Generally, the material learned in several classes must be applied in an imaginative way to achieve the required objective. Non-credit machine shop practice and AutoCAD classes are available to aid the design and construction of projects. Many design projects are sponsored by industry. Those projects involving hardware may result in construction and testing of prototypes.

Postgraduate studies in the Department are concentrated in the areas of stress analysis, heat transfer, multi-phase flow, fluid and thermal power, dynamics of rotating machines, robotics, vibrations, and computer aided design and manufacturing. Research and project master's degrees as well as the doctoral degree are offered.

Since DalTech is so closely associated with Canada's oceans, the Department of Mechanical Engineering also offers programmes in Naval Architecture, particularly at the post-graduate level. Both research and project master's degrees are available as well as the doctoral degree in Naval Architecture. A small towing tank is used for model experiments and the analytical part of the program is supported by excellent computer facilities.

II. Co-op and Internship Programmes

All students registering in the Mechanical programme are classified as co-op students and all of them are eligible for co-op or internship work terms. The first two and the last academic years at DalTech cannot be interrupted by co-op work terms or an internship year. The longest possible work period is four (4) terms of internship. All the work terms are subject to departmental approval.

Students who have successfully completed the requirements for the degree of Bachelor of Engineering and who, in addition, have accumulated 1400 hours or more of approved work experience, will receive the "Co-op Programme" designation on their degree.

Mechanical Engineering offers two versions of the BEng programme:

1. Co-Op Programme which is completed over 9 academic terms
2. Internship Programme which is completed over 8 academic terms

A. Co-Op Schedule

Yr/Term	Fall	Winter	Summer
Year 1	AT1	AT2	FREE
Year 2	AT3	AT4	FREE
Year 3	AT5	WT	AT6
Year 4	WT	AT7	WT
Year 5	AT8	AT9	

B. Co-op Programme Guide

Year 1 follows the common programme outlined in the Engineering section of this calendar.

Year 2, Term 3 (Fall)

- ENGM 2121.03 Engineering Mathematics III
- ENGM 2081.03 Computer Programming
- ENGI 2800.03 Engineering Thermodynamics I
- ECED 2000.03 Electric Circuits
- ENGI 2200.03 Mechanics of Materials
- Humanities I

Year 2, Term 4 (Winter)

- MECH 2100.03 Engineering Design and Graphics II
- ENGM 2032.03 Applied Probability & Statistics
- ENGI 2300.03 Fluid Mechanics
- ENGI 2400.03 Mechanics II
- Humanities II

Year 3, Term 5 (Fall)

- ENGM 3361.03 Vector Calculus & PDE
- CPST 2000.03 Technical Communication
- MECH 3010.03 Machine Design I
- MECH 3500.03 Dynamics of Machines
- MECH 3800.03 Engineering Thermodynamics II

Year 3, Work Term 1 (Winter)

Year 3, Term 6 (Summer)

- ENGM 3352.03 Numerical Methods & Linear Algebra
- METL 3500.03 Material Science
- IENG 2005.03 Engineering Economics
- Complementary Studies I

Year 4, Work Term 2 (Fall)

Year 4, Term 7 (Winter)

- MECH 3900.03 Systems I
- MECH 3300.03 Fluid Dynamics
- MECH 3700.03 Heat Transfer I
- MECH 3020.03 Machine Design II
- Complementary Studies II

Year 4, Work Term 3 (Summer)

Year 5, Term 8 (Fall)

- MECH 4010.03 Design Project I
- MECH 4600.03 Engineering Measurements
- MECH 4300.03 Stress Analysis
- MECH 4900.03 Systems II
- Technical Elective I

Year 5, Term 9 (Winter)

- MECH 4020.03 Design Project II
- MECH 4500.03 Vibrations
- MECH 4000.03 Manufacturing (Content TBA)
- Technical Elective II
- Technical Elective III

C. Internship Programme Schedule

Year 1 follows the common programme outlined in the Engineering section of this calendar.

Yr/Term	Fall	Winter	Summer
Year 1	AT1	AT2	FREE
Year 2	AT3	AT4	FREE
Year 3	AT5	AT6	WT
Year 4	WT	WT	WT
Year 5	AT7	AT8	

NOTE: This version of the curriculum allows graduation within 4 years if a student does not take an internship.

D. Internship Programme Guide

Year 1 follows the common programme outlined in the Engineering section of this calendar.

Year 2, Term 3 (Fall)

- ENGM 2021.03 Engineering Mathematics III
- ENGM 2081.03 Computer Programming
- ENGI 2800.03 Engineering Thermodynamics I
- ECED 2000.03 Electric Circuits
- ENGI 2200.03 Mechanics of Materials
- Humanities I

Year 2, Term 4 (Winter)

- ENGM 2032.03 Applied Probability & Statistics
- ENGI 2300.03 Fluid Mechanics
- ENGI 2400.03 Mechanics II
- MECH 2100.03 Engineering Design and Graphics II
- Humanities II
- IENG 2005.03 Engineering Economics

Year 3, Term 5 (Fall)

- ENGM 3361.03 Vector Calculus & PDE
- CPST 2000.03 Technical Communication
- MECH 3010.03 Machine Design I
- MECH 3500.03 Dynamics of Machines
- MECH 3800.03 Engineering Thermodynamics II
- METL 3500.03 Material Science

Year 3, Term 6 (Winter)

- MECH 3900.03 Systems I
- MECH 3300.03 Fluid Dynamics
- MECH 3700.03 Heat Transfer I
- MECH 3020.03 Machine Design II
- Complementary Studies I
- ENGM 3352.03 Numerical Methods & Linear Algebra

Year 3, Work Term 1 (Summer)

Year 4, Work Term 2 (Fall)

Year 4, Work Term 3 (Winter)

Year 4, Work Term 4 (Summer)

Year 5, Term 7 (Fall)

- MECH 4010.03 Design Project I
- MECH 4600.03 Engineering Measurements
- MECH 4300.03 Stress Analysis
- MECH 4900.03 Systems II
- Technical Elective I
- Technical Elective II

Year 5, Term 8 (Winter)

- MECH 4020.03 Design Project II
- MECH 4500.03 Vibrations
- MECH 4000.03 Manufacturing
- MECH 4000.03 Technical Elective III
- Complementary Studies II

E. Technical Elective Choices

- MECH 4340.03 Engineering Applications of Plastics
- MECH 4440.03 Principles of Marine Craft Design
- MECH 4450.03 Marine Craft Design and Construction
- MECH 4460.03 Structural Analysis and Design of Marine Vehicles
- MECH 4521.03 Applied Dynamics
- MECH 4530.03 Acoustics
- MECH 4540.03 Aerodynamics
- MECH 4631.03 CAD/CAM
- MECH 4638.03 Computer Aided Toler. & Dimensioning
- MECH 4640.03 Introduction to Robotics
- MECH 4650.03 Biomechanical Engineering
- MECH 4660.03 Finite Element Method in Mechanical Design
- MECH 4710.03 Heat Transfer II
- MECH 4810.03 Energy Conversion Systems
- MECH 4820.03 Energy from Renewable Resources

- MECH 4830.03 Reciprocating Internal-Combustion Engines
- MECH 4840.03 Steam Plant Engineering
- MECH 4851.03 Heating, Ventilating & Air Conditioning
- MECH 4910.03 Fluid Power
- MECH 4960.03 Computational Methods in Engineering

F. Service Class

For Agricultural and Industrial Engineering Programmes:

- MECH 4330.03 Mechanical Design

NOTES:

1. Not all of these classes will be offered every year.
2. Seniors may take a postgraduate class as a Technical Elective with the approval of the Department Head and the professor offering the class.
3. Technical Electives may be taken from other engineering departments with the permission of the Head of the Mechanical Engineering Department.

III. Classes Offered

CPST 2000.03: Technical Communication.

This class deals with several aspects of professional activity including the preparation of technical memos, letters and reports. Topics include professional associations, the relationship of engineers to society and the subject of engineering societies and their work in publications, codes and standards. Guest lecturers are invited to participate in discussions. Throughout the class students practice their writing skills by submitting assignments which are marked for clarity, style and presentation as well as for proper English.

EXCLUSION: ME3210

ECED 2000.03: Electric Circuits.

This is an introductory class in electric circuit analysis. The material covered starts with a review of the fundamental circuit variables such as voltage, current charge, power and energy. Kirchhoff's laws are introduced and developed into node and mesh analysis techniques. Terminal behaviour and circuit equivalence including Thevenin and Norton circuits are covered. Analysis with controlled sources and energy storage elements is developed including steady state and transient response for first order networks. Phasors and sinusoidal steady state are introduced. Students are introduced to circuit simulation tools such as p-spice.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ENGI 2230.03

ENGI 2200.03: Mechanics of Materials.

This introductory class 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. Incompressible viscous flow through pipes is also presented.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ENGI 2331.03

ENGI 2300.03: Fluid Mechanics.

This second class in Engineering Mechanics considers the kinematics and kinetics of a single particle and a single rigid body. The class builds on the concepts introduced in MECH 1200 (Mechanics I). Both vector and scalar methods are used. Topics include kinematics of a particle, kinetics of a particle, kinematics of a rigid body in plane motion, and planar kinetics of a rigid body.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ENGI 2341.03

ENGI 2400.03: Mechanics II.

This second class in Engineering Mechanics considers the kinematics and kinetics of a single particle and a single rigid body. The class builds on the concepts introduced in MECH 1200.03

(Mechanics I). Both vector and scalar methods are used. Topics include kinematics of a particle, kinetics of a particle, kinematics of a rigid body in plane motion, and planar kinetics of a rigid body.
PREREQUISITES: MECH 1200.03, ENGM 2081.03
EXCLUSION: ENGI 2222.03

ENGI 2800.03: Engineering Thermodynamics I.

Fundamental definitions and concepts are reviewed. Engineering analysis of properties, heat, work and systems is carried out. The zeroth, first, and second laws are presented. Ideal gases and mixtures, real gases, liquid-vapour relations, availability, irreversibility, entropy concepts, and flow in nozzles and diffusers is examined. Gas and vapour power cycles are studied with emphasis on cycle analysis.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ME3810

ENGM 2021.03: Engineering Mathematics III.

This class covers first order linear and non-linear differential equations, differential equations of higher order with constant coefficients, applications to Engineering problems, power series solutions, Laplace transforms, periodic functions, applications of Laplace transforms to linear systems, Fourier Series, the line spectrum.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MATH 3110.03, MATH 3120.03

ENGM 2032.03: Applied Probability and Statistics.

The topics covered include probability laws and the interpretation of numerical data, probability distributions and probability densities, functions of random variables, joint distributions, characteristic functions, inferences concerning mean and variance, tests of hypotheses, and introduction to linear regression. The class emphasizes engineering applications and makes extensive use of statistical computer packages.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MATH 2060.03, MATH 2080.03

ENGM 2081.03: Computer Programming.

This class covers fundamental programming principles including flow control, modularity, and structured programming. The student will implement significant programs in the C language to solve engineering problems.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ENGI 2240.03

ENGM 3352.03: Numerical Methods and Linear Algebra.

This class provides an introduction to Numerical Analysis and Linear Algebra with emphasis on solution of problems related to Mechanical Engineering. The following topics are covered: a brief review of FORTRAN; concepts of software engineering; approximations and errors; roots of non-linear equations; matrix algebra, vector spaces and systems of equations, numerical solution of systems of equations, LU decomposition, Singular Value decomposition, condition number; curve fitting; numerical integration and differentiation; and numerical solution of ordinary differential equations.

PREREQUISITES: ENGM 2021.03

ENGM 3361.03: Vector Calculus and Partial Differential Equations.

This class covers space curves, arclength, curvature, functions of several variables, partial derivatives, implicit functions, constrained and unconstrained extrema, multiple integrals, line, surface, and volume integrals, scalar and vector fields, gradient, divergence and curl, Stokes Theorem, the Divergence Theorem, and applications to heat flow and fluid flow, boundary value problems, partial differential equations, separation of variables, solution of heat equation, wave equation, and Laplace's equation with various boundary conditions.

PREREQUISITES: ENGM 2021.03

ENGR 2005.03: Engineering Economics.

This class deals with the ergonomics of Engineering Design. After introducing fundamental concepts and cash flow diagrams, interest factors are dealt with in some detail. A variety of discounted cash flow techniques are covered including rate of return calculations. Inflation, tax, replacement and risk are also amongst the topics considered.

FORMAT: Lecture 3 hours, lab 1 hour

EXCLUSION: IE0718

MECH 2100.03: Engineering Design and Graphics II.

This class provides a project-based exercise in the engineering design process. Students work in teams and as individuals on defined projects which utilize knowledge and skills in graphics, statics, computing, and mechanics of materials. The projects encompass conceptual design, detailed analysis, engineering drawings, experimentation, physical model fabrication, laboratory testing, and preparation of professional reports.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ENGI 2101.03

PREQUISITES: ENGI 1100.03, ENGI 1400.03, ENGI 2200.03

MECH 3010.03: Machine Design I.

(Design for Reliability)

The application of basic concepts of strength of materials to machine design including design concepts, stress, and theories of failure is developed. Topics include: load analysis, materials, static stresses, strain and deflection, failure, impact, fatigue, surface damage. Applications include: screw fastenings, weldments, springs.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ME3320

MECH 3020.03: Machine Design II.

(Machine Components)

The use of engineering principles in the design of machine components is developed. Topics include: Lubrication and sliding bearings, roller bearings, spur gears, helical, bevel and worm gears, shafts, clutches and brakes, power transmissions such as belts, chains and hydrodynamic drives.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ME4310

PREQUISITES: MECH 3010.03

MECH 3300.03: Fluid Dynamics.

This class presents an introduction to turbines, pumps, fans and compressors. The concept of ideal fluid flow is introduced. Velocity potential and stream function solutions are obtained for inviscid flows. Boundary layer theory is presented. Numerical methods for solving fluid flow problems are given.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ME4420

PREQUISITES: ENGI 2300.03

MECH 3500.03: Dynamics of Machines.

The class focuses on design of mechanism, their motion, static and dynamic link loads, and power transmission. It includes planar and spatial 4-bar, 5-bar, and 6-bar linkages, cam mechanisms, gear trains, rotor systems, and manipulators. Linkage inversion, transformation, and synthesis are used for design of new mechanisms. Graphic, analytical, computer, and physical modeling techniques are used. Many real life mechanisms are analyzed.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ME3520

MECH 3700.03: Heat Transfer I.

This class is an introduction to the three modes of heat transfer: conduction, convection, and radiation. Topics covered in conduction include steady-state conduction, in one and two dimensions. In convection heat transfer forced internal and external flows are examined. Some basic concepts of natural convection are introduced. The fundamentals of radiant heat transfer are covered, including solar radiation and radiative heat transfer between simple geometric objects.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ME4710

PREQUISITES: ENGI 2800.03

MECH 3800.03: Engineering Thermodynamics II.

This class is a continuation of Engineering Thermodynamics I. The basic thermodynamic laws and principles are applied to various engineering problems, with emphasis on non-reacting mixtures, psychrometry, combustion processes, enthalpy of formation, chemical equilibrium, compressible flow; expansion and compression processes, vapor compression and absorption refrigeration, and heat pumps. Laboratory section includes experiments in psychrometric processes, reciprocating compressors, and vapor refrigeration cycles.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ME4810

PREQUISITES: ENGI 2800.03

MECH 3900.03: Systems I.

The class deals with the analysis of dynamic physical systems. Differential-equation models are developed for mechanical, thermal, fluid and electrical systems. System equations are solved using classical methods and Laplace-transform techniques. S-plane characteristics are introduced, as are block-diagram & state-space representations. Systems are simulated by digital computer in the laboratory portion.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ME4910

MECH 4000.03: Manufacturing.

The class starts with a manufacturing process overview and a detailed process study in the following areas: manual assembly, machining, injection molding, thermoforming and casting. A relationship between process and design is examined and design for manufacturing methodologies is introduced. Quality control and quality assurance issues are overviewed. The principles of cell design for assembly and machining are introduced and part redesign for process and system is studied.

FORMAT: Lecture 3 hours, lab 2 hours

MECH 4010.03: Design Project I.

This class develops the use of fundamental theory in the detailed design of a suitable project selected by the student in consultation with the department. The student is expected to take the project from its preliminary stage through the various design stages to the ultimate completion of the design, which include a detailed report with calculations, drawings, possibly a model and a verbal presentation.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ME5310

MECH 4020.03: Design Project II.

This class is a continuation of Design Project I leading to a final report and formal presentation. The presentation will be made to fellow students and departmental staff members prior to the last day of lectures.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ME5320

PREQUISITES: MECH 4010.03

MECH 4300.03: Stress Analysis.

Course topics include: general state of stress, equilibrium equations, stress-strain-temperature relations, plane stress, axisymmetrical stress problems, thick cylindrical pressure vessels, rotating disks, bending of rectangular and circular plates, torsion of non-circular members, membrane analogy, thin-walled hollow sections, non-symmetrical bending, properties of cross-sections, shear center, composite beams, plastic hinge, buckling of columns with partial end constraints, beam columns, Energy Methods, Castigliano's theorems, statically indeterminate problems, introduction to the finite element method.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ME4320

MECH 4330.03: Mechanical Design.

This class deals with design of machine elements as well as machines. The class utilizes the background of knowledge in mechanics, properties of materials, and strength of materials. The class is designed to develop sound judgement and practice in design. Emphasis is placed on design and not simply on problem solving or analysis. The class is not intended for Mechanical Engineering students.

FORMAT: Lecture 3 hours, lab 3 hours
EXCLUSION: ME5330

MECH 4340.03: Engineering Applications of Plastics.

A basic overview of polymer science for engineers is presented. Manufacturing processes for Thermoset and Thermoplastic materials are considered. Injection molding is covered in detail for Thermoplastic materials. Injection mold design and the flow of the melt into the mold as well as the heat transfer and mold cooling systems are studied. The testing and quality control of plastic products is considered. A major portion of the class will be devoted to the design and analysis of injection molds using a commercial CAD/CAM software package CADMOLD.

FORMAT: Lecture 2 hours, lab 3 hours
EXCLUSION: ME5340

MECH 4430.03: Turbomachines.

Various types of turbomachines, from wind turbines to high-ratio compressors are studied. Although hydraulic pumps and turbines are treated, the majority of the class time is devoted to compressible flow turbomachines and their characteristics. Emphasis is placed on practical design and performance parameters.

FORMAT: Lecture 2 hours, lab 3 hours
EXCLUSION: ME5430

MECH 4440.03: Principles of Marine Craft Design.

This class covers the fundamentals of hydrostatics and hydrodynamics of marine craft. Topics include: hydrostatics and stability calculations for marine craft; dimensional analysis and modelling of marine systems; resistance estimation of low-speed and high-speed craft; sail power, marine propellers and jet propulsion; directional stability and control and wave theory and motion in waves.

FORMAT: Lab 3 hours
PREREQUISITES: ME3420, MECH 3300.03
EXCLUSION: ME5440

MECH 4450.03: Marine Craft Design and Construction.

This class deals with design and construction methods for marine craft. Each student completes a preliminary design of a small marine vessel. Topics include: engineering and economic principles governing selection of dimensions and coefficients for marine craft, computer-aided design, design and generation of hull forms, performance and operability in the ocean environment, construction methods for glass-fibre, wood, aluminum and steel marine craft, and structural analysis and design.

FORMAT: Lab 3 hours
PREREQUISITES: ME5440/MECH 4440.03 or instructor's consent
EXCLUSION: ME5450

MECH 4460.03 Structural Analysis and Design of Marine Vehicles.

Types of loading and environmental conditions affecting a marine vehicle are considered. Topics include: longitudinal, transverse and local deformations of a marine structure; determination of stresses and strains; materials of construction; composite construction; superstructures and discontinuities; grillages, hull plates and the effect of stiffeners; hull structural dynamics; statistical approach to strength; hull structural design concepts; role of the Classification Societies in structural design process.

FORMAT: Lecture 3 hours, lab 3 hours
EXCLUSION: ME5450

MECH 4500.03: Vibrations.

Single and multiple degree of freedom lumped parameter systems subjected to harmonic and transient excitation are examined. Analytical as well as numerical solutions are covered. Vibrations of continuous systems such as beams and shafts are introduced. Laboratory experiments deal with vibration of lumped parameter physical models as well as vibrations of rotating machinery. Vibration control in industrial applications is emphasized and the effects of whole body vibration on humans is treated as a safety issue.

FORMAT: Lecture 3 hours, lab 2 hours
EXCLUSION: ME5510

MECH 4521.03: Applied Dynamics.

This class begins with a review of planar kinematics and kinetics of rigid bodies. These concepts are extended to kinematics and kinetics of rigid bodies undergoing general three dimensional motion. Euler's Equations are applied to a wide range of engineering problems including vehicular and gyroscopic dynamics. Energy methods for bodies undergoing three dimensional motion are applied to multi-degree-of-freedom systems. Single-degree-of-freedom systems subjected to random and shock inputs are analyzed.

FORMAT: Lecture 2 hours, lab 3 hours
EXCLUSION: ME5521

MECH 4530.03: Acoustics.

This class introduces the engineer to the physics of sound. The theoretical aspects of sound will be used to explore the effects of sound on man in various environments. Methods to control noise in buildings, special rooms and mechanical equipment will be treated in depth. Practical examples and some measurements as well as discussion of existing legislation will also be included.

FORMAT: Lecture 2 hours, lab 3 hours
EXCLUSION: ME5530

MECH 4540.03: Aerodynamics.

The class deals with the fundamentals of aerodynamics and the theory of flight. Material covered includes: the standard atmosphere; airfoil coefficients and section properties; finite wings and induced drag; airplane performance - power required, rate of climb, range and endurance; basics of stability and control.

FORMAT: Lecture 2 hours, lab 3 hours
EXCLUSION: ME5540

MECH 4600.03: Engineering Measurements.

The static and dynamic characteristics of first and second order transducers and measurement systems are examined. The experimental versus theoretical approach to engineering problems is studied. Topics include data acquisition, analysis, and presentation, including the probabilistic nature of engineering measurements. The class is laboratory intensive covering measurements of force, strain, temperature, pressure, and fluid flow. Computers are used extensively in the laboratory experiments.

FORMAT: Lecture 3 hours, lab 3 hours
EXCLUSION: ME4620

MECH 4631.03: CAD/CAM - Computer Aided Design/Computer Aided Manufacturing.

The student is introduced to the concept of automation with application to design, production, and manufacturing systems. The use of digital computers is considered in design, including peripheral equipment and types of languages. Other topics include numerical control manufacturing systems such as Direct Numerical Control (DNC), Computer Numerical Control (CNC), Adaptive Control and Industrial Robots. Due to the diverse nature of the class content, various personnel from both the academic and industrial community aid in the class presentation.

FORMAT: Lecture 3 hours, lab 3 hours
EXCLUSION: ME5630

MECH 4638.03: Computer Aided Tolerancing and Dimensioning.

This class deals with dimensioning and mechanical tolerances to international standards - key factors in quality production. Topics covered include: review of basic manufacturing processes and tools, fundamental dimensioning and tolerances techniques, working and assembly drawings, CAD/CAM drawings for computer numerical control, geometric and positional tolerancing, quantity production, parts assembly, quality control and application of statistical and probabilistic methods. Biweekly assignments requires use of Auto-CAD, interactive computer programs for geometrical dimensioning/tolerancing, and a Coordinate Measuring Machine (CCM).

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITES: ME3220/MECH 3020.03, ME4310/MECH

3010.03, completed or concurrently taking Auto-CAD class

offered by the DalTech authorized Auto-CAD Training Centre

EXCLUSION: ME5638

MECH 4640.03: Introduction to Robotics.

The prime objective of the class is to provide a survey of the state-of-the-art in robotics. A large portion of the class is focused on the robot hardware. However, robotics is an inherently interdisciplinary field and the class will also involve robotics control and application. Topics covered include kinematics and dynamics of the robot arm and gripper, drives, robot position measuring systems, external sensors and feeding, storage, changing position and clamping devices, all of which, together with the robot itself, constitute a "robotized" workplace.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: ME5640

CROSS-LISTINGS: BIOE 4011.03

MECH 4650.03: Biomechanical Engineering.

Engineering analysis of biological systems provides novel insight into evolutionary design of animals and plants and into the intelligent design of medical devices. This class examines the structure and function of the cardiovascular, pulmonary, and musculoskeletal systems using tools from solid and fluid mechanics. Topics include the heart as a pump, blood flow, arterial pulse propagation, the mechanics of breathing lung elasticity, muscle contraction, tissue mechanics, basic skeletal design, locomotion, and engineering of surgical implants.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: Permission of the instructor

EXCLUSION: ME5650

MECH 4660.03: Finite Element Method in Mechanical Design.

Class deals with the application of the finite element method to stress analysis problems encountered in mechanical design. Introduction to the finite element method is followed by the necessary relationships from linear elasticity, beam and plate theory. Various categories of structural elements are discussed in order of increasing complexity. Stresses in one- and two-dimensional trusses, beams, axisymmetric solids, and plates are considered. Finite element program is introduced and used in the class assignments.

FORMAT: Lecture 2 hours, lab 3 hours

PREREQUISITES: ME4320/MECH 4300.03, ENGI 2331/ENGI

2200.03

EXCLUSION: ME5660

MECH 4710.03: Heat Transfer II.

Solution techniques for complex heat transfer problems are studied. Radiation heat transfer is examined along with natural and forced convection systems. Other topics include condensation and boiling heat transfer, heat exchangers, radiation exchange between real surfaces and solar radiation. Natural convection topics include empirical and practical relationships. Radiation including radiation properties, shape factors, energy exchange between non-black bodies are covered.

FORMAT: Lecture 2 hours, lab 3 hours

PREREQUISITE: ME4710/MECH 3700.03

EXCLUSION: ME5710

MECH 4810.03: Energy Conversion Systems.

Application of basic principles of thermodynamics, fluid mechanics and heat transfer to the analysis and synthesis of energy conversion systems are studied. Primary energy sources and global energy demand are examined. Principles of conventional methods, thermal systems, fuel types, combustors, and gas turbines, initial planning of a hydroelectric power plant, selection of turbines and other components, nuclear fission and fusion, clean energy production, and environmental aspects of energy production are covered.

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITES: ME3810/ENGI 2800.03, ME4820/ENGI 3800.03,

ENGI2341/ENGI 2300.03, ME4420/MECH 3300.03,

ME4710/MECH 3700.03

EXCLUSION: ME5810

MECH 4820.03: Energy from Renewable Resources.

This class concentrates on the theoretical and practical aspects of solar, wind, tidal and wave sources of energy with particular emphasis on their availability and use in the Atlantic Provinces.

Design feasibility studies are undertaken on particular aspects of energy conversion from these sources. The impact of the environment of consumption of conventional energy forms is investigated. The nature and magnitude of energy consumption world-wide and locally is considered.

FORMAT: Lecture 2 hours, lab 3 hours

PREREQUISITE: ME4820/ENGI 3800.03

EXCLUSION: ME5820

MECH 4830.03: Reciprocating Internal-Combustion Engines.

The major topics of this class are basic engine types, test methods and pressure measurements, combustion, ideal cycles and model processes, equilibrium charts, fuel specifications and tests, engine knock, exhaust analysis, fuel systems, ignition systems, engine performance and supercharger matching. Hands-on laboratory work is an integral part of this class.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ME5830

MECH 4840.03: Steam Plant Engineering.

This class aims to provide basic fundamental and practical information to engineering students to design and operate thermal power plants. The following topics are covered: classification of steam generators; comparison of water tube and fire tube boilers; energy sources: nuclear and fossil fuel; fuels and combustion; thermal analysis of furnaces, superheaters, economizers, and air pre-heaters; boiler efficiency calculations; description of different types of heat exchangers; evaporators and condensers; steam generation systems: Pulverized, Cyclone, Fluidized beds; auxiliary equipment (fans, stacks); control system; cooling system design; environmental considerations.

FORMAT: Lecture 2 hours, lab 3 hours

PREREQUISITE: ME3810/ENGI 2800.03, ME4820/ENGI 3800.03,

ENGI2341/ENGI 2300.03, ME4420/MECH3300.03,

ME4710/MECH 3700.03

EXCLUSION: ME5840

MECH 4851.03: Heating, Ventilating and Air Conditioning.

This is an introduction to the design of thermal systems for indoor climate control. The major topics include: human comfort requirements, outdoor climate variables, heating and dehumidification loads, cooling and dehumidification loads, ventilation requirements and criteria, central system types and selection, energy sources and costs, piping, pumps, ducts, fans, refrigeration systems and control systems. Computer programs will be used for design calculations involving heating and cooling load, piping, ducting and energy consumption.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: ME4820/ENGI 3800.03

EXCLUSION: ME5851

MECH 4900.03: Systems II.

Response characteristics of open loop and feedback control systems are studied. Various controller types and their uses are analyzed. Techniques such as root-locus diagrams and Bode & Nichols plots are used for stability and performance evaluation. Digital simulations and experiments on computer-based control systems are done in the laboratory portion.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ME4920

MECH 4910.03: Fluid Power.

This is an introductory class to fluid power systems covering the principles of power hydraulics, hydraulic fluids, hydraulic actuators and power generation transducers. The concept of pressure controls, volume controls and directional controls is also covered, including an introduction to electro-hydraulic servos and the design of basic open and closed-center circuits. The time domain analysis of feedback systems is introduced. The student is introduced to the design and compensation of systems using both s-plan and time domain methods. Other topics include simulation and analysis of control systems using graphics terminal computer facilities.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ME5910

MECH 4960.03: Computational Methods In Engineering.

The class presents basic computer methods of application of mathematical tools to solve engineering problems. Numerical methods such as finite differences, series expansions, and numerical integration are introduced. Numerical solutions of ordinary and partial differential equations with applications to equilibrium, eigenvalue and propagation problems in engineering are considered. Application of mathematical libraries, X-window system and the software tools associated with the Unix system are included.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: ME5960

METL 3500.02: Materials Science.

This class correlates properties of engineering materials with their structure. Laboratory objectives include preparation of reports in publication format and illustration of lecture material. Basic concepts of crystallography, chemical bonding and binary phase diagrams are introduced. These are used to describe properties of metallic and nonmetallic materials and how these may be controlled by engineers. Materials discussed include ferrous and nonferrous metals and alloys, ceramics, polymers, concrete, composites and semiconductors.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: MET0700

Mining and Metallurgical Engineering

Professors

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 Kipouros, G.J., DipEng (Athens), MASC (Tor), PhD (Tor), PEng,
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Adjunct Assistant Professor

Kasemets, J.T., BEng (RMC), MEng (Albta), MBA (Ott)

I. Co-op Metallurgical Engineering Programme

To be eligible to enter the Co-op B.Eng. Programme, a student must successfully complete all the classes in the Associated Universities. Students who have credits different than those described in Terms 1 through 4, should consult the Head of the Department.

Co-operative Education Programmes consist of alternating periods of planned work experience in industry and academic study. The concept has been applied successfully to many branches of education including engineering and several universities have adopted this method of study for their whole engineering faculty. In 1979, Metallurgical Engineering was the first engineering discipline at DalTech to introduce the Co-op system. It has proven to be very popular with both students and employers.

The Metallurgical Engineering Programme at DalTech has been designed to give the student extensive coverage of a field which is itself very broad. There are three main branches of metallurgy: ore dressing, chemical metallurgy and physical metallurgy. Ore dressing is concerned with the purification of metal bearing minerals after they have been mined. The processes depend on separations based on the physical properties of the minerals (density, surface characteristics and magnetic properties) and are usually carried out at the mine site. Chemical metallurgy involves the extraction of the metals from the minerals by chemical reactions.

Traditionally, these processes have involved high temperature reactions (smelting) or aqueous extraction processes (hydrometallurgy). Physical metallurgy pertains to the properties of metals and alloys, their fabrication and production. Usually the graduating metallurgist will choose to specialize in one of these three branches.

The main employers of metallurgists are primary metal producers, large fabricators of metals and Government research establishments. There are two Co-op Programs offered in Metallurgical Engineering, one a BEng Degree and the other a Combined BEng/MASc Degree. The undergraduate curriculum is the same for both programmes.

The Combined BEng/MASc Program was developed to permit the identification of students interested in and eligible to pursue graduate studies before they have completed all of their undergraduate classes. It allows the Department to do more advanced planning for graduate studies and offers the student an additional Co-op work period plus financial assistance during part of the undergraduate portion as well as the graduate portion. The decision to select the Combined BEng/MASc option may be made at the end of the common first three academic terms in Metallurgical Engineering.

II. Co-Op Bachelor Degree Programme

A. Entrance Requirements

The entrance requirements for the BEng Programme in Metallurgical Engineering are the normal entrance requirements to the Faculty of Engineering at DalTech. Students who are unable to obtain complete transcripts from their Associated Universities may be accepted conditionally for registration in the programme.

B. Work Experience

The University Co-op Office solicits appropriate jobs from industry and government. Students compete for jobs of their preference by submitting resumes and attending interviews. The employer's preferences and the student's preferences are matched if possible. Students should be prepared to work anywhere in Canada.

The University endeavours, but makes no commitment to find a job for every student. A student is at liberty to arrange his or her own job, but in order to qualify as part of the Co-op work experience, it must be approved by the Department.

Each work term will be evaluated as "Met Requirement" or "Requirement Not Met" and will not affect the computation of averages. Academic credit will be assigned if satisfactory evaluations of the various components of the work term are achieved.

Students who have successfully completed the requirements for the degree of Bachelor of Engineering and who, in addition, have accumulated 1400 hours or more of approved work experience, will receive the "Co-op Program" designation on their degree.

C. Co-op BEng (Metallurgical Engineering) Schedule

Yr/Term	Fall	Winter	Summer
Year 1	AT1	AT2	FREE
Year 2	AT3	AT4	FREE/WT0
Year 3	AT5	AT6	WT1
Year 4	AT7	WT2	WT3
Year 5	AT8	AT9	

D. Programme Guide

Year 1 follows the common programme outlined in the Engineering section of this calendar.

Year 2, Term 3 (Fall)

- ENGM 2021.03 Engineering Mathematics III
- ENGM 2081.03 Computer Programming
- ENGI 2800.03 Engineering Thermodynamics I
- ECED 2000.03 Electric Circuits
- ENGI 2200.03 Mechanics of Materials
- Humanities I

Year 2, Term 4 (Winter)

- ENGM 2062.03 Engineering Mathematics IV(a)
- ENGM 2032.03 Applied Probability & Statistics
- ENGI 2300.03 Fluid Mechanics
- ENGI 2400.03 Mechanics II OR
- MECH 2100.03 Engineering Design and Graphics II
- IENG 2005.03 Engineering Economics
- CPST 2000.03 Technical Communications

Year 2, Work Term 0 (Summer)

Year 3, Term 5 (Fall)

- ENGM 3652.03 Applied Numerical Methods
- IDIS 2000.03 Fundamentals of Environmental Engineering
- METL 3500.03 Materials Science
- METL 3510.03 Fundamental Extractive Metallurgy
- MINE 3500.03 Geology for Engineers
- MINE 3530.03 Mineral Processing

Year 3, Term 6 (Winter)

- CHEE 3550.03 Process Dynamics and Control
- METL 3601.03 Structure of Materials
- METL 3611.03 Corrosion and its Prevention
- METL 3612.03 Metallurgical Thermodynamics
- METL 3620.03 Introduction to Physical Metallurgy
- METL 3621.03 Mechanical Behaviour of Materials

Year 3, Work Term 1 (Summer)

Year 4, Term 7 (Fall)

- CHEE 3632.03 Kinetics and Ideal Reactors
- METL 4714.03 Hydrometallurgy
- METL 4703.03 Non-Metallic Materials
- METL 4722.03 Ferrous Alloys and Welding
- Technical Elective I
- METL 4704.03 Metallurgical Project
- Graduate Class I (For combined B.Eng./M.A.Sc. Students)

Year 4, Work Term 2 (Winter)

Year 4, Work Term 3 (Summer)

Year 5, Term 8 (Fall)

- CPXXXX Complementary Studies
- METL 4802.03 Metallurgical Process Design
- METL 4804.03 Metallurgical Project
- METL 4815.03 Kinetics of Pyrometallurgical Processes
- Technical Elective II
- Technical Elective III
- Graduate Class II (for combined B.Eng./M.A.Sc. Students)

Year 5, Term 9 (Winter) (Optional for B.Eng.)

- Technical Elective I
- Technical Elective II
- Technical Elective III
- Graduate Class III (for combined B.Eng./M.A.Sc. Students)

III. Co-Op Combined BEng - MASC Programme

A. Programme Entrance Requirements

To be eligible to enter the Combined BEng/MASC Programme, a student must be able to demonstrate an overall average of 70% based on the subjects in the first three academic terms of the Metallurgical Engineering Programme.

Since the first three academic terms of the BEng and combined BEng/MASC Programmes are common, students enrolled in the B.Eng. Programme may apply for entrance into the combined degree programme at any time before the beginning of the seventh academic term.

B. Financial Support

All students accepted into the BEng/MASC Programme will be eligible for financial assistance beginning at the start of the seventh academic term. The assistance will be spread over the remainder of the academic terms and may have a total value of approximately \$10,000.00.

Part of the financial assistance is derived from money obtained to further specific research objectives on which the student is expected to work for his or her Master's Thesis. The remainder of the financial support is normally derived from assigned duties as Part-Time Teaching Assistants. A class work Master's Programme (MEng) can be followed but the amount of financial assistance will be considerably reduced.

C. Maintenance of Standing

In order to retain standing in the Combined BEng/MASC Programme, students must continue to maintain an academic average of B-. Failing this, a student may obtain a BEng Degree only by completing the required classes, but will not be eligible for further financial assistance from the Department. However, on graduation should the student attain an average of B-, he/she may be eligible to pursue graduate studies in the department.

D. Scholarships

Students in the Combined BEng/MASC Programme are encouraged to apply for the usual scholarships and bursaries in order to partially augment the financial support received. See the Department for details.

E. Co-op Combined BEng/MASC Schedule

The combined BEng/MASC Degree follows the same programme as the BEng with the addition of one additional work term and two academic terms as follows:

Yr/Term	Fall	Winter	Summer
Year 1	AT1	AT2	FREE
Year 2	AT3	AT4	FREE/WT0
Year 3	AT5	AT6	WT1
Year 4	AT7	WT8	WT2
Year 5	AT9	AT10	WT3
Year 6	AT11	AT12	

F. Programme Guide

Years 1 to 5 follow the same curriculum as the BEng programme. The curriculum for Year 6 follows.

Year 5 Work Term 3 (Summer)

Year 6, Term 11 (Fall)

- Graduate Class IV
- Graduate Class V
- Thesis
- Thesis
- Thesis

Year 6, Term 12 (Winter)

- Graduate Class VI
- Thesis
- Thesis
- Thesis

G. Technical Electives

Choose 3:

- METL 4823.03 Non-Ferrous Alloys
- METL 4824.03 Industrial Metallurgy
- METL 4805.03 Electrochemical Processing of Materials
- MINE 4830.03 Advanced Mineral Processing
- MECH 4330.03 Mechanical Design
- METL 4813.03 Iron and Steel Production
- METL 4806.03 Particulates in Metallurgical Processes
- METL 4825.03 Solidification and Casting
- MINE 4831.03 Coal Processing

Technical electives from other departments may be selected subject to availability and the approval by the departments concerned.

Not all technical electives will be offered every year.

IV. Co-Op Mining Engineering Programme

Mining is a world-wide activity and an indispensable supplier of raw materials to industrialized nations.

In addition to the discovery, extraction and preparation of minerals from the Earth's crust, the skills of mining engineers are needed to evaluate the economics of mineral deposits; develop plans for the location of roads, shafts, tunnels and chambers; plan surface mines, underground openings and structures, mine ventilation systems and drainage systems; ensure mine safety and environmental protection; and develop innovative mining technology.

Areas of study in the Mining Engineering Programme include surface and underground mining, material handling, rock drilling and fragmentation, rock mechanics, mine ventilation, safety and environmental control, mineral processing, mining economics, geology and mine waste management.

The Mining Engineering Programme also offers Petroleum Engineering studies in the areas of well drilling, reservoir engineering, formation evaluation, well completion and production.

The development of an analytical attitude, team work and communication skills are important aims of the Mining Engineering Programme. Participation in field trips to mining operations in the Maritime region is a degree requirement and each student is required to share costs.

The main employers for mining engineers are the mineral resource industries, oil and gas industries, financial and government institutions, consulting companies, equipment manufacturers and dealerships, marketing mine service companies, mineral investment and financial institutions, research and teaching institutions. Students enrolled in B.Eng. in Mining Engineering can obtain Co-op work experience alongside the academic education.

Students who have successfully completed the requirements for the degree of Bachelor of Engineering and who, in addition, have accumulated 1400 hours or more of approved work experience, will receive the "Co-op Program" designation on their degree. Opportunity also exists to continue in the M.A.Sc., M.Eng., and Ph.D. programmes for those who would like to specialize in areas of Mining and Petroleum Engineering at DalTech.

A. Co-Op BEng (Mining Engineering) Schedule

Yr/Term	Fall	Winter	Summer
Year 1	AT1	AT2	FREE
Year 2	AT3	AT4	FREE
Year 3	AT5	AT6	WT1
Year 4	AT7	WT2	WT3
Year 5	WT4	AT8	

B. Programme Guide

Year 1 follows the common programme outlined in the Engineering section of this calendar.

Year 2, Term 3 (Fall)

- ENGM 2021.03 Engineering Mathematics III
- ENGM 2081.03 Computer Programming
- ENGI 2800.03 Engineering Thermodynamics I
- ECED 2000.03 Electric Circuits
- ENGI 2200.03 Mechanics of Materials
- Humanities I

Year 2, Term 4 (Winter)

- ENGM 2062.03 Engineering Mathematics IV(a)
- ENGM 2032.03 Applied Probability & Statistics
- ENGI 2300.03 Fluid Mechanics
- ENGI 2400.03 Mechanics II
- IENG 2005.03 Engineering Economics

- CPST 2000.03 Technical Communications OR Humanities Class

Year 3, Term 5 (Fall)

- ENGM 3652.03 Applied Numerical Methods
- CIVL 3710.03 Engineering Surveying
- METL 3500.03 Materials Science
- MINE 3500.03 Introduction to Geology for Engineers
- MINE 3510.03 Operations of the Minerals Industry
- MINE 3530.03 Mineral Processing

Year 3, Term 6 (Winter)

- IENG 3311.03 Modelling & Design of Industrial Systems
- MINE 3605.03 Mining Geology I
- MINE 3610.03 Mining Engineering Analysis I
- MINE 3611.03 Rock Mechanics
- MINE 3612.03 Rock Penetration & Fragmentation
- MINE 3620.03 Petroleum Engineering

Year 3, Work Term 1 (Summer)

Year 4, Term 7 (Fall)

- CIVL 4150.03 Soils and Foundation
- IDIS 2000.03 Fundamentals of Environmental Engineering
- MINE 4705.03 Mining Geology II
- MINE 4711.03 Mine Ventilation and Environment Control
- MINE 4712.03 Mineral Economics
- MINE 4714.03 Computer-Aided Mine Planning

Year 4, Work Term 2 (Winter)

Year 4, Work Term 3 (Summer)

Year 5, Work Term 4 (Fall)

Year 5, Term 8 (Winter)

- CP XXXX Complementary Studies
- MINE 4810.03 Mine Plant Design & Valuation
- MINE 4812.03 Mine Production Engineering
- MINE 4814.03 Mining Engineering Analysis II
- Technical Elective I
- Technical Elective II

C. Technical Electives

- CIVL 4420.03 Geo-Environmental Engineering
- CIVL 4440.03 Water and Wastewater Treatment
- CIVL 4450.03 Environmental Engineering
- IENG 4574.03 Decision and Risk Analysis
- MINE 4801.03 Advanced Topics in Rock Mechanics
- MINE 4815.03 Mining and the Environment
- MINE 4816.03 Mining Engineering Project
- MINE 4817.03 Mining Engineering Seminar
- MINE 4818.03 Mine Waste Management
- MINE 4820.03 Surface Mine Slope Stability
- MINE 4821.03 Petroleum Reservoir Engineering
- MINE 4830.03 Advanced Mineral Processing
- MINE 4831.03 Coal Processing
- MINE 4832.03 Flotation

Technical electives from other departments may be selected subject to availability and the approval by the departments concerned.

Not all technical electives will be offered every year.

V. Classes Offered

CHEE 3550.03: Process Dynamics and Control.

This class provides an introduction to control of chemical processes. The dynamics of behaviour of simple processes is analyzed through transfer functions and means of determining the dynamic performance of feedback control systems are presented. An

introduction to stability of control systems is made. Procedures for selecting and designing proportional, proportional-integral and proportional-integral-derivative controllers are discussed.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: CHE1050

CHEE 3632.03: Kinetics and Ideal Reactors.

This class introduces the subject of chemical reaction engineering. Classical reaction kinetics concerning rates, mechanisms, temperature effects, and multiple reactions are studied. The concepts of batch, continuous stirred-tank and plug flow reactors are introduced for the ideal case.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CHE1032

CIVL 3710.03: Engineering Surveying.

This class covers surveying theory, methods, layout procedures, and calculations necessary for elementary mapping and most Civil Engineering construction work. During the practical session of this class students become familiar with the use and operation of modern surveying equipment to measure distances, elevations, directions, and angles.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: CE0765

CIVL 4150.03: Soils and Foundations.

This class deals with the nature and physical properties of soil. It covers the subjects of index properties, soil moisture, compressibility and consolidation characteristics, and stress-deformation-strength behaviour of soils. It presents the methods of analysis for the stability of slopes, evaluation of earth pressures and safe bearing capacity, and the design of various types of foundation elements. In the laboratory sessions certain soil properties are experimentally evaluated.

CPST 2000.03: Technical Communication.

The class deals with several aspects of professional activity including the preparation of technical memos, letters and reports. Topics include professional associations, the relationship of engineers to society and the subject of engineering societies and their work in publications, codes and standards. Guest lecturers are invited to participate in discussions. Throughout the class students practice their writing skills by submitting assignments which are marked for clarity, style and presentation as well as for proper English.

EXCLUSION: ME3210

ECED 2000.03: Electric Circuits.

This is an introductory class in electric circuit analysis. The material covered starts with a review of the fundamental circuit variables such as voltage, current charge, power and energy. Kirchhoff's laws are introduced and developed into node and mesh analysis techniques. Terminal behaviour and circuit equivalence including Thevenin and Norton circuits are covered. Analysis with controlled sources and energy storage elements is developed including steady state and transient response for first order networks. Phasors and sinusoidal steady state are introduced. Students are introduced to circuit simulation tools such as p-spice.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ENGI 2230.03

ENGI 2200.03: Mechanics of Materials.

This introductory class 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. Incompressible viscous flow through pipes is also presented.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ENGI 2331.03

ENGI 2300.03: Fluid Mechanics.

This second class in Engineering Mechanics considers the kinematics and kinetics of a single particle and a single rigid body. The class builds on the concepts introduced in MECH 1200 (Mechanics I). Both vector and scalar methods are used. Topics include kinematics of a particle, kinetics of a particle, kinematics of a rigid body in plane motion, and planar kinetics of a rigid body.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ENGI 2341.03

ENGI 2400.03: Mechanics II.

This second class in Engineering Mechanics considers the kinematics and kinetics of a single particle and a single rigid body. The class builds on the concepts introduced in MECH 1200.03 (Mechanics I). Both vector and scalar methods are used. Topics include kinematics of a particle, kinetics of a particle, kinematics of a rigid body in plane motion, and planar kinetics of a rigid body.

FORMAT: Lecture 3 hours, lab/tutorial 3 hours

PREREQUISITES: MECH 1200.03, ENGM 2081.03

EXCLUSION: ENGI 2222.03

ENGI 2800.03: Engineering Thermodynamics I.

Fundamental definitions and concepts are reviewed. Engineering analysis of properties, heat, work and systems is carried out. The zeroth, first, and second laws are presented. Ideal gases and mixtures, real gases, liquid-vapour relations, availability, irreversibility, entropy concepts, and flow in nozzles and diffusers is examined. Gas and vapour power cycles are studied with emphasis on cycle analysis.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ME3810

ENGM 2021.03: Engineering Mathematics III.

This class covers first order linear and non-linear differential equations, differential equations of higher order with constant coefficients, applications to Engineering problems, power series solutions, Laplace transforms, periodic functions, applications of Laplace transforms to linear systems, Fourier Series, the line spectrum.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MATH 3110.03, MATH 3120.03

ENGM 2032.03: Applied Probability and Statistics.

The topics covered include probability laws and the interpretation of numerical data, probability distributions and probability densities, functions of random variables, joint distributions, characteristic functions, inferences concerning mean and variance, tests of hypotheses, and introduction to linear regression. The class emphasizes engineering applications and makes extensive use of statistical computer packages.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MATH 2060.03, MATH 2080.03

ENGM 2062.03: Engineering Mathematics IV(a).

This class covers geometric vectors in three dimensions, dot product, cross product, lines and planes, complex numbers, systems of linear equations, matrix algebra, matrix inverse, rank, determinants, Cramer's rule, space curves, arc length, curvature, functions of several variables, partial derivatives, implicit functions, constrained and unconstrained extrema, multiple integrals, surface area and volume, scalar and vector fields, line integrals, gradient, divergence and curl.

FORMAT: Lecture 4 hours, lab 1 hour

EXCLUSION: MATH 2480.03, MATH 2490.03

ENGM 2081.03: Computer Programming.

This class covers fundamental programming principles including flow control, modularity, and structured programming. The student will implement significant programs in the C language to solve engineering problems.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ENGI 2240.03

ENGM 3652.03: Applied Numerical Methods.

This class provides an introduction to Numerical Analysis with emphasis on solution of Engineering problems. The class covers the following topics: a brief review of FORTRAN; concepts of software engineering; approximations and errors; roots of linear and non-linear equations; LU decomposition, Singular value decomposition, condition number; curve fitting; numerical differentiation and integration; and numerical solution of ordinary differential equations.

FORMAT: Lecture 3 hours, lab 2 hours

PREREQUISITES: ENGM 2021.03 and ENGM 2062.03

EXCLUSION: AM3652

IDIS 2000.03: Fundamentals of Environmental Engineering.

The class will focus on sources of environmental pollutants, the effects of pollutants on living and non-living systems, and the processes by which pollutants are generated or by which their effects can be minimized or remediated. Lectures are supplemented by tutorials which include guest speakers, case studies and field trips.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: ID0066

IENTG 2005.03 - Engineering Economics.

This class deals with the ergonomics of Engineering Design. After introducing fundamental concepts and cash flow diagrams, interest factors are dealt with in some detail. A variety of discounted cash flow techniques are covered including rate of return calculations. Inflation, tax, replacement and risk are also amongst the topics considered.

FORMAT: Lecture 3 hours, lab 1 hour

EXCLUSION: IE0718

IENTG 3311.03: Modelling and Design of Industrial Systems.

This course introduces students to the modelling and design of industrial systems. The history, development and theoretical basis of industrial engineering will be discussed. A broad cross section of industrial engineering techniques for designing, modelling or analyzing production processes will be presented. Specific topics include manufacturing planning, work place design and ergonomics, operations management, project planning, and operations research. Students will submit a project which uses IE techniques to analyze and improve an existing production process.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: IE0711

MECH 2100.03: Engineering Design & Graphics II.

This class provides a project-based exercise in the engineering design process. Students work in teams and as individuals on defined projects which utilize knowledge and skills in graphics, statics, computing, and mechanics of materials. The projects encompass conceptual design, detailed analysis, engineering drawings, experimentation, physical model fabrication, laboratory testing, and preparation of professional reports.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: ENGI 2101.03

METL 3500.03: Materials Science.

This class correlates properties of engineering materials with their structure. Laboratory objectives include preparation of reports in publication format and illustration of lecture material. Basic concepts of crystallography, chemical bonding and binary phase diagrams are introduced. These are used to describe properties of metallic and nonmetallic materials and how these may be controlled by engineers. Materials discussed include ferrous and nonferrous metals and alloys, ceramics, polymers, concrete, composites and semiconductors.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: MET0700

METL 3510.03: Fundamental Extractive Metallurgy.

The lecture portion of this class covers the fundamental principles involved in the high temperature extraction of metals from their ores. Included are descriptions of the equipment used in unit operations such as roasting, smelting and refining and the application of these operations to the production of iron and steel and the more common nonferrous metals. The laboratory portion of this class consists of practice in stoichiometric and thermochemical calculations of common pyrometallurgical processes for extracting metals.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: MET0710

METL 3601.03: Structure of Materials.

This class presents the following topics: the electronic structure of materials, fundamentals of crystallography, electron motion in the space lattice, introduction to composites, X-ray diffraction and X-ray diffraction techniques, and the crystal structure of crystalline materials. Typical binary phase diagrams are discussed from the structural point of view. Structural changes produced by cold working and precipitation hardening are discussed.

Laboratory experiments include preparation and evaluation of X-ray films and diffractometer charts, structural investigation of binary alloys, and crystallite size structure.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: MET 0801

PREREQUISITE: MET0700 or METL 3500.03

METL 3611.03: Corrosion and Its Prevention.

This class covers the basic theories of corrosion and their application to its prevention. It includes a description of corrosion testing methods, metal failure arising from corrosion processes and design factors affecting corrosion. Laboratory experiments are used to illustrate the processes involved in corrosion.

FORMAT: Lecture 2 hours, lab 2 hours

EXCLUSION: MET0811

METL 3612.03: Metallurgical Thermodynamics.

The class covers the application of thermodynamic concepts such as entropy, enthalpy, free energy, and activities to the understanding of high temperature reactions in chemical metallurgy. The application of computer programs to the analysis of chemical thermodynamics is demonstrated. Problem solving sessions to illustrate the applications of these concepts to typical metallurgical reactions are given.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: MET0812

METL 3620.03: Introduction to Physical Metallurgy.

Crystallography, solid solutions and mechanical properties of metals are reviewed. Stereographic projection is introduced. Deformation twinning, martensite formation and the shape memory effect are studied as practical examples. Binary phase diagrams are reviewed. Vacancies, diffusion, and nucleation and growth phenomena are discussed. Solidification and growth phenomena are introduced. Dislocation interactions are examined to describe work hardening and precipitation hardening. Laboratory exercises illustrate lecture material and provide experience in metallography.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: MET 0820

PREREQUISITES: MET0700 or METL 3500.03

METL 3621.03: Mechanical Behaviour of Materials.

This class includes a review of the Mohr's stress and strain circles. Three-dimensional stress and strain concepts are considered, including plane stress and plane strain. Flow theories, fracture, fatigue and creep of materials are studied. Linear elastic fracture mechanics is introduced. Emphasis is on metallic materials, although polymers, composites and ceramics are also studied.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: MET1021

METL 4703.03: Non-Metallic Materials.

This class includes a description of the chemical and structural characteristics of various common non-metallic materials as well as manufacturing methods. A number of applications for such materials are considered including glass, composites, refractories, solid electrolytes and electronic materials. The chemistry of multi-component systems are also discussed. The laboratory experiments are designed to illustrate the lecture material.

FORMAT: Lecture 2 hours, lab 2 hours

EXCLUSION: MET1303

METL 4704.03/5804.03: Metallurgical Project.

The class objective is to provide experience in the application of engineering principles to the solution of a specific problem in Metallurgical Engineering. A research project is chosen in collaboration with a particular faculty member. The student then prepares a work plan, carries out a literature search, designs experimental setup as needed, and arranges for the acquisition of necessary equipment. The student conducts the planned research work, analyses the data obtained and critically evaluates the findings. Oral progress reports are required. A written report and an oral presentation are required at the end of the term.

FORMAT: Lab 6 hours

EXCLUSION: MET1404

METL 4714.03: Hydrometallurgy.

Lectures cover the principles of hydrometallurgy including leaching processes, solution purification and metal recovery methods. The laboratory experiments are designed to illustrate the main principles covered in the lecture periods.

FORMAT: Lecture 2 hours, lab 2 hours

EXCLUSION: MET1014

METL 4722.03: Ferrous Alloys and Welding.

The class reviews the iron-carbon system, including the transformation products of austenite, alloying elements and combined thermo-mechanical treatments. Specific classes of steels, ranging from the simple plain carbon steels to the duplex stainless steels, are considered. The class also discusses the fusion welding of a representative selection of steels. Fusion welding process variables are studied together with the metallurgy of the weld metal and the heat-affected zone. Welding defects are discussed and the application of ASME Boiler and Pressure Vessel Code, Section IX, to the welding of pressure vessels and piping.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MET1322

METL 4802.03: Metallurgical Process Design.

This class focuses on the design of new metallurgical plants, processes and products based on knowledge acquired in previous core classes. Material and heat balances, metal economics, design and optimization aspects are covered. Groups of students undertake design projects aiming at modernization of existing plants or establishing new plants operating on new technology. Emphasis is placed on process selection and economic evaluation, detailed design of process equipment, sizing, costing and optimizing the processing units.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: MET1302

METL 4805.03: Electrochemical Processing of Materials.

The class discusses principles of electrochemistry and electrochemical engineering as they apply to the design of processes for the production of materials. The theory and application of various electrochemical techniques such as electroplating, electroforming, electromachining, electrorefining, and fused-salt electrolysis are included. A brief overview on the development of electrochemical sensors and devices using solid state electrolytes is presented. Surface modification by electrochemical means is also discussed.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: MET1305

METL 4806.03: Particulates In Metallurgical Processes.

The class covers the preparation, characterization, physical and chemical properties and processing of powders in metallurgical processes including agglomeration, gas-solid reactions, sintering and hot pressing.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: MET1406

METL 4813.03: Iron and Steel Production.

This class discusses factors affecting the global iron and steel industry with particular reference to Canadian participation. These factors include the supply of raw materials, new technology, environmental concerns and economics. The future of any metallurgical industry is influenced by many concerns, not all of which are technical.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: MET1013

PREREQUISITE: MET0710 or METL 3510.03

METL 4815.03: Kinetics of Pyrometallurgical Processes.

This class covers the physical, chemical and thermal factors affecting the kinetics of the heterogeneous reactions used in the production of metals by pyrometallurgical processes. The principles of physical and mathematical modeling are demonstrated. Problem-solving sessions to illustrate the application of the above concepts to metallurgical processes are given.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: MET1315

METL 4817.03: Metallurgical Processing.

This class covers the principal practices related to metallurgical processing and the marketing of metals, including modification of concentrates (sintering, pelletizing, briquetting). Descriptive outlines of metallurgical processes such as iron and steel, lead, aluminum and zinc production are presented, along with utilization of fuels for metallurgical purposes (coal, coke, oil).

FORMAT: Lecture 3 hours

EXCLUSION: MET 0717

METL 4823.03: Non-Ferrous Alloys.

A review of special alloy requirements for design of pressure vessels, gas turbines, nuclear applications and airframes is presented. An investigation of mechanics in alloy design, properties of solid solutions, microstructure in alloy design for strength and toughness, and alloys with oxide dispersions and precipitates is included. The design of structural alloys with high temperature corrosion resistance is also investigated.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: MET1323

METL 4824.03: Industrial Metallurgy.

The fundamentals of metalworking in relation to rolling, forging, extrusion and drawing are studied. Casting principles related to pattern design moulding, coremaking, gating and risering are studied. The production of metal powders, pressing and sintering operations in powder metallurgy are covered. In each field the physical metallurgy principles involved are considered. Laboratory experiments in rolling, casting and powder metallurgy are performed.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: MET1324

METL 4825.03: Solidification and Casting.

The fundamental principles of solidification and practical applications in the casting industry are dealt within this class. The topics covered are nucleation processes, the growth of single crystals, plane front, cellular and dendritic solidification in single and polyphase alloys, solidification of castings, ingot moulding and core making processes, moulding sands, design of risers and gates, and the melting of metals. The laboratory experiments cover the

growth of single crystals of pure metals, alloys, and semiconductors; pattern, mould and core making; and, the casting of commercial alloys.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: MET1425

METL 4826.03: Physical Metallurgy and Ceramics.

The first portion of this class covers the physical metallurgy, properties and uses of the principle industrial alloys. The remainder of the class deals with the structure of important ceramic materials such as glass, porcelain and refractories, their properties, and the processing and applications of ceramics. The laboratory experiments will illustrate the principles discussed in the lectures.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: MET1026

MINE 3500.03: Introduction to Geology for Engineers.

This class deals with the fundamental principles of geology. Topics include mineralogy, rock-forming processes, weathering, erosion, groundwater, glaciation, mass wasting, running water, deserts, shorelines, geologic structures, tectonism, and Earth's interior. The links between geology, engineering and the environment are explored through case studies. Laboratory exercises covering the identification and interpretation of minerals, rocks, landforms (using topographic maps and remote sensing images) and geologic map structures are an important part of the class.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MIN0700

MINE 3510.03: Operations of the Minerals Industry.

This class is an introduction to the mineral industry and mining engineering. Emphasis is placed on mining methods, equipment, and ground control practices. Innovative technologies such as bioleaching, solution mining and seafloor mining are covered. A summary of the relationships between mining and metallurgical processing is included. Laboratory periods are used to view audio-visual presentations of mineral industry processes, prepare limited projects on mining operations and review mine plans.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: MIN0710

MINE 3530.03: Mineral Processing.

This class is concerned with the principles of unit operations employed in the physical processing of minerals: examination of mineral characteristics on which mineral separation methods are based, liberation of minerals, crushing, grinding, screening and classification. Mineral separation methods include: gravity, dense medium, magnetic and high tension separations, radiometric sorting, flotation and selective flocculation. Laboratory tests, their interpretations, and assessment of separation performance are covered.

FORMAT: Lecture 3 hours

EXCLUSION: MIN1030

MINE 3605.03: Mining Geology I.

This class covers the topics of mineralogy, petrology of igneous, sedimentary and metamorphic rocks and tectonic structures. Emphasis is placed on the relationships between these topics and mining engineering. Laboratory exercises and assignments cover petrographic analysis, geologic maps and sections, structure contours, core logging, grade and tonnage calculations, stereographic projection and mineral stoichiometry.

FORMAT: Lecture 3 hours, lab 3 hours

PREREQUISITE: MIN0700 or MINE 3500.03

EXCLUSION: MIN0805

MINE 3610.03: Mining Engineering Analysis I.

This class deals with mining equipment, analysis of parameters influencing the performance of equipment, and equipment selection. Included are cost analysis and estimation, unit costs, compressed air and hydraulic power systems applications in mining, materials handling systems in underground and surface mining operations, ore and waste pass systems, and storage bins.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MIN1010

MINE 3611.03: Rock Mechanics.

Concepts of mechanical behaviour and intact strength properties of rock masses are discussed. Classification systems and failure criteria for rocks are described. The principles of engineering design for underground and surface mine structures are covered. Stereographic projections and numerical methods are used to analyze surface and underground rock stability. Rock mechanics instrumentation is discussed. Laboratory sessions cover sample preparation and rock testing.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: MIN1010, MIN1011

PREREQUISITE: MIN0805 or MINE 3605.03

MINE 3612.03: Rock Penetration and Fragmentation.

This class presents the principles and theories of rock drilling and blasting in both underground and surface mining applications. It covers the properties of explosives and the principles for selection of explosives for different situations. The transportation methods, loading techniques and priming procedures for explosives are discussed. Current trends in drilling and blasting practices are considered as well as controlled blasting and blast monitoring methods. State-of-the-art techniques in rock penetration and fragmentation are presented.

FORMAT: Lecture 3 hours

EXCLUSION: MIN1012

MINE 3620.03: Petroleum Engineering.

This class is designed to provide a comprehensive overview of the engineering aspects of the petroleum industry. Similarities between mining and petroleum engineering are stressed. Major topics cover well planning, rotary drilling techniques, drilling optimization, well cementing, well completion, and production methods. Equipment selection and design procedures follow each unit operation.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MIN1320

MINE 4705.03: Mining Geology II.

The physical characteristics and origins of the main types of ore deposits are covered. Individual orebodies are described in terms of their mineralogy, rock types, structures and geologic factors affecting mining engineering. Laboratory sessions and assignments concentrate on the three dimensional analysis of ore deposits using hand specimen petrography, stereographic and orthographic projection, isopach maps, structure contour maps and computerized reserve modelling. A field project using the first suitable weekend is mandatory.

FORMAT: Lecture 3 hours, lab 3 hours

EXCLUSION: MIN 1005

PREREQUISITE: MIN0805, MINE 3605.03

MINE 4711.03: Mine Ventilation and Environment Control.

This class presents the main principles of total mine air conditioning: air quality, air quantity, and temperature-humidity control in underground mines. Health hazards such as mine dusts, gases, radiation, and heat stress are discussed. Design of airflow in single openings, circuit analysis, and ventilation network design are studied using manual and computer based techniques.

Temperature-humidity control systems design is discussed. Mine illumination and noise control are studied as part of the total mine environment.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MIN0811

MINE 4712.03: Mineral Economics.

This class applies the economic concept of a free enterprise system to evaluate the investment risk factors in the mineral industry. The major subjects discussed are the influence of mineral commodities on economy and politics, mineral policy, marketing of mineral commodities, price mechanisms, mine project evaluation, feasibility studies, and mine financing. A term report is assigned to each student to conduct a mineral economics analysis.

FORMAT: Lecture 2 hours, lab 2 hours

EXCLUSION: MIN1312

MINE 4714.03: Computer-Aided Mine Planning.

This class deals with planning and design of underground and surface mining operations, long and short-term mine production, planning, and project planning and execution. Students are familiarized with computer-aided mine planning through the application of software in CAD. Computer experience is gained in the use of commercially available software for geological data analysis, mineral resource modelling, mine design and valuation.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MIN1314

MINE 4801.03: Advanced Topics In Rock Mechanics.

This class deals with several specific topics in rock mechanics related to ground stability control in surface and underground mines. It covers ground failure, ground movement monitoring, "in-situ" stress management, application of numerical modelling methods, and back-analysis techniques in mining engineering. Theory and state-of-the-art of relevant techniques are discussed. Case studies are introduced to discuss practical problems.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: MIN1401

PREREQUISITE: MINE3611.03 or permission by instructor

MINE 4810.03: Mine Plant Design and Valuation.

This class is an application of mine planning, including preparation of feasibility studies, financial analysis, and mine plans and maps. Individual counseling of students is provided. Each student is required to prepare one evaluation report of a selected mining property, including presentation of mining methods, equipment selection, and economic valuation.

FORMAT: Lecture 2 hours, lab 4 hours

EXCLUSION: MIN1410

MINE 4812.03: Mine Production Engineering.

The topics covered in this class are: engineering and management techniques to increase mine productivity; operating units problems analysis, production scheduling and optimization; material movement modelling, and mine maintenance. The tutorial includes computer applications in mine production and class discussions of case studies. Each student is required to solve problems and produce a term project using computer simulation programs.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: MIN1412

MINE 4814.03: Mining Engineering Analysis II.

This class deals with several specialized mining topics including mine drainage in underground and surface operations, excavation systems including tunneling and shaft sinking techniques, mining related soil mechanics, pressure grouting, ground freezing and mine backfilling.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MIN1310

MINE 4815.03: Mining and the Environment.

This class covers environmental practices, problems and solutions in the mineral industry, including air and water contamination, conservation, surface subsidence, land reclamation, geologic hazards, nuclear waste disposal, government regulations, environmental ethics, and alternative resources. Case studies are used to highlight these topics. Oral and written student presentations based on library research form an integral part of the class.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MIN1315/1415

PREREQUISITE: MIN0700 or MINE 3500.03

MINE 4816.03: Mining Engineering Project.

This project allows interested students to investigate a mining topic, which may also be oriented towards geology, mineral processing, environmental issues, or petroleum engineering. The topic must be original and acceptable to the department. A detailed written report of the investigation is required, which is evaluated by two professionals, one of whom is the student advisor.

FORMAT: Lab 5 hours

EXCLUSION: MIN1316/1416

MINE 4817.03: Mining Engineering Seminar.

At each session students give prepared addresses on subjects related to developments on mining engineering topics that are of common interest to the members of the group. Careful selection of subject matter and adequate preparation is required. The use of proper English expression is stressed. Constructive criticism is offered by the staff and discussion by the students is encouraged.

FORMAT: Lecture 2 hours

EXCLUSION: MIN1417

MINE 4818.03: Mine Waste Management.

This class provides general understanding of the relationship between planning, technical requirements and design of safe, economical and environmentally acceptable mine waste disposal sites. A major portion of the class is devoted to site selection, waste disposal methods and design procedures for waste disposal sites. Monitoring techniques of waste water quality are discussed along with efficient treatment for environmental control. Other topics include acid mine drainage, site reclamation and alternative options to mineral waste disposal.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: MIN1318/1418

MINE 4820.03: Surface Mine Slope Stability.

This class deals with the fundamentals of slope stability analysis in surface mining. A brief discussion is first given to field data collection and the mechanism of slope failure. Various techniques for solving slope problems encountered in the mining industry are then introduced, including plane failure, wedge failure, toppling, and rotational failure.

FORMAT: Lecture 2 hours, lab 3 hours

PREREQUISITE: MIN1011 and MIN0710 or MINE 3611.03 and MINE 3510.03

MINE 4821.03: Petroleum Reservoir Engineering.

This class discusses the theory and calculations in petroleum reservoir engineering. Major topics include petroleum composition, formation, migration and trapping mechanisms, classification and properties of reservoir rocks and fluids, fluid flow through porous media, phase behaviour diagrams, reservoir energy and recovery mechanisms, reservoir evaluation, as well as geological and reservoir considerations in drilling, and production engineering. An introduction to petroleum exploration methods, and data interpretation techniques is also included.

FORMAT: Lecture 3 hours, lab 2 hours

EXCLUSION: MIN1321/1421

MINE 4830.03: Advanced Mineral Processing.

The objective of this class is to teach how unit operations of mineral processing may be integrated into overall plant operation. The topics considered are: the influence of ore characteristics on the choice of process, concentration methods applicable to various ores with reference to flow diagrams and operations in existing concentrators, basic principles of mineral processing plant design and development of a process flow sheet of a plant based on laboratory test work.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: MIN1430

PREREQUISITE: MIN1030 or MINE 3530.03

MINE 4831.03: Coal Processing.

This class offers detailed study of coal cleaning processes and is intended for students with a special interest in the field. The topics covered are: properties of coal, size reduction, screening, jigs, dense medium baths and cyclones, Dyna-whirlpool and Vorsyl separators, water-only cyclones, shaking tables, spirals, flotation, split conditioning, oil agglomeration, selective flocculation, dry concentration, sulphur reduction, dewatering, refuse disposal, evaluation of optimum cleaning results and a flowsheet design project.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: MIN1331/1431

MINE 4832.03: Flotation.

This class provides detailed study of flotation and is designed for students who intend to work in mineral processing or related fields. The topics covered are: interfaces involved in a flotation system; interfacial energies; contact angle; electrical double-layer effects; stability of suspensions; adsorption mechanisms; collectors, frothers, activators and depressants; modulation of collectors; froth stability; fines entrainment in froth lamellae; flotation kinetics; flotation machines; flotation of sulphides, oxides, salines and nonmetallic minerals, and flotation circuit design.

FORMAT: Lecture 2 hours, lab 3 hours

EXCLUSION: MIN1332/1432

Centres and Institutes

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

Atlantic Health Promotion Research Centre

Director: Dr. R. Lyons
Co-ordinator: S. Crowell

The AHPRC was established in 1993 and is dedicated to research which can improve the health of individuals and communities - physically, mentally, socially, and spiritually. The main goal is to conduct research and to encourage health promotion research initiatives in Atlantic Canada.

The AHPRC provides assistance with the development of health related research ideas, offers advice and consultation on proposals and reports; helps with networking, advises on potential funding sources, offers letters of support, a regular newsletter, a Web site, a library of health promotion materials and workshops and seminars on health promotion research.

The AHPRC works with community groups, individuals, academic researchers, health professionals and students.

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 classes 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, MSc, 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 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 cations and signalling, and neurobiology. 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 and neurological disorders 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 agencies such as the Medical Research Council of Canada, the Dalhousie Medical Research Foundation, and the governments of the three Maritime provinces and by private donations.

Canadian Institute of Fisheries Technology

Director: T.A. Gill, BSc, MSc, PhD

The Canadian Institute of Fisheries Technology was established at DalTech as part of its thrust in the early 1980's toward the creation of applied research centres. The Institute was created by the DalTech Board of Governors with funding from the University and the Government of Canada. In addition, the federal Department of Fisheries and Oceans provided much of its early specialized laboratory and seafood pilot scale processing equipment. As a government approved laboratory for advanced technology, it also provides R&D services on a cost recovery basis to industry and to various governmental agencies. The Institute promotes technology transfer and the development of advanced technologies aimed at more effective commercial utilization of fish supplies in Canada and throughout the world.

In addition, the CIFT offers unique opportunities for post graduate training and research through the Department of Food Science and Technology. Major areas of emphasis are: food biochemistry; fats, oils and nutraceuticals; physical properties of foods; fish/food process engineering; computerized control in the food processing industry; seafood safety and preservation; seafood toxins and food rheology.

Facilities

The Canadian Institute of Fisheries Technology is located in the MacDonald building of DalTech at 1360 Barrington Street in downtown Halifax. The Institute's facilities consist of the following areas:

- general office
- marine oils laboratory
- seafood chemistry laboratories and instrument rooms
- microbiology laboratory and autoclave room
- food kitchen and sensory panel area
- engineering pilot plant
- computer-controlled cold storage facility
- teaching laboratory
- physical properties laboratory

These areas contain instrumentation and food processing equipment for experimental processing, product storage and evaluation and laboratory analyses. In addition to a cold storage facility, the pilot plant is equipped for experimental processing including modified atmosphere storage, freezing, retorting, packaging, chilling, drying and smoking, and meat-bone separation. The pilot plant is especially well equipped for thermal processing research. Specialized laboratory instrumentation includes Waters automated HPLC equipment, Perkin-Elmer differential scanning calorimeter, Pen-Ken electrokinetic analyzer, ultracentrifuge, computer-driven U.V. Visible spectrophotometer, Perkin Elmer spectrofluorometer, Pharmacia fast protein liquid chromatography system, research microscope equipped with bright field/dark field, phase contrast and fluorescence optics, Du Nouy tensiometer, vertical and horizontal isoelectric focussing/electrophoresis equipment, capillary electrophoresis, Instron Universal Tester, Bohlin controlled stress rheometer, Paar rolling ball viscometer, 2 HP impedance analyzers and a Molecular Devices micro-plate reader. Gas and high pressure liquid chromatographic systems, as well as an ion trap GLC detector and a purge-and-trap headspace analyzer are available for the analysis of fish oils and trace constituents.

Educational Opportunities

Graduate programs are available in Fisheries Engineering and Food Science at the Master's and Doctoral level through the Department of Food Science and Technology. Graduate level class work and research opportunities relate to food science, seafood processing technology, marine oils, engineering design, packaging technology,

fish post-mortem biochemistry, food rheology and food process science. Students with degrees in food science, engineering, chemistry/biochemistry, microbiology or biology are invited to apply.

Centre for African Studies

Location: 1461 Seymour Street
Halifax, NS B3H 3J5
Telephone: (902) 494-3814/2105
Fax: (902) 494-2105
Director: J.L. Parpart, MA, PhD

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

Centre for Foreign Policy Studies

Director: Timothy M. Shaw, PhD

Established in 1971 the Centre is concerned with teaching, research, publication, policy advice and other professional activities in the various aspects of foreign policy, security studies and international politics. It is funded through the Security and Defence Forum of the Department of National Defence and other foundations, government agencies and contracts.

The Centre's work is concentrated in the area of Canadian and comparative maritime and oceans policy and strategy but it also deals with international political economy and regional and global development. Its geographical specializations include foreign policy in Canada, Europe, the South (especially Africa, Asia and the Caribbean), and the U.S. The Centre encourages activities in these areas by Research & Doctoral Fellows and advances communication among local and international communities in these fields through seminars, workshops, conferences and colloquia, often co-sponsored by local, national and/or international organizations. It publishes occasional papers and monographs plus a monthly Defence Newsletter on Canadian defence and security policy issues.

The Centre is an integral part of the Department of Political Science. Centre faculty offer classes through the Department in foreign and defence policy, international relations and development, and maritime affairs at both undergraduate (majors & honours) and graduate (MA and PhD) levels. They also supervise masters and doctoral theses in these fields.

Centre for International Business Studies

Director: M.R. Brooks, BOT, MBA, PhD

The Centre was established in 1975 and is funded by the Department of Foreign Affairs and International Trade. 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

Acting Director: David B. Scott, 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 Earth Sciences, Oceanography and Physics and has close links with other oceanographic institutions in North America. 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.

Centre for Marine Vessel Development and Research (CMVDR)

Director: C.C. Hsiung, PhD, PEng, CEng, FRINA, Professor of Naval Architecture, Former McConnell Chair of Engineering Manager, Business Development: T.W. Edwards, BSc, PEng, CEng, MRINA

The Centre was established at DalTech in 1989 to provide specialized technical services to the Marine Industry. Emphasis is on pure and applied research in marine dynamics, with particular focus on the performance prediction analysis of marine vessels and offshore structures.

Areas of expertise include:

- Fundamental research of ship/boat hydrodynamics
- Ship/boat motion and wave-loads, including response of offshore structures in waves
- Vessel seakeeping and safety studies, including swamping and capsize behaviour in extreme seas
- Optimal hull forms for minimum resistance
- Ship maneuverability in restricted waters
- Computer simulation of ship motions and flow fields
- Small Craft model tank tests
- Full scale tests, at sea

CMVDR has a policy to involve graduate students of the Naval Architecture Programme as much as possible in its research contracts with industry.

Research Facilities

Small Craft Towing Tank

The small craft towing tank is located in the Civil Engineering Hydraulic Laboratory at DalTech. The tank's dimensions are 1m x 1m x 30m. The carriage has a maximum velocity of 4.0m/s (13ft/sec) and can sustain a constant carriage speed over a usable rail length of 25m. The fully-automated carriage control system allows the operator to pre-select a desired test velocity profile so that a maximum constant velocity window is obtained within the safe operating limits of the tank.

A computer-controlled wave-making system is installed in the tank, comprising two wave-makers, one at each end. Each can act as a wave-maker or a wave-absorber. The system can make progressive or standing waves, as well as regular or irregular waves. The maximum wave height is about 0.3m (1 ft).

Computing Facilities

CMVDR and the post-graduate Naval Architecture Programme has sophisticated and networked Computer Systems to support its advanced research work. The systems comprise Silicon Graphics and HP Workstations and Pentium PC's running in Unix and/or Win 95 and Win NT.

The computer systems are used for running numerical computations, required for the on-going development of numerical techniques to solve complex hydrodynamic problems. Advanced 2D and 3D visualization software is also developed on the systems so that real-time dynamic simulations can be carried out and displayed.

In addition to advanced hydrodynamic and hydroelastic software developed in-house, CMVDR has commercial hull design and analysis software packages, including FastShip, GHS, Shipul 2000, AutoShip and ABS Safehull which are used to complement research efforts, and to instruct naval architecture students.

Centre for Water Resources Studies

Director: D.H. Waller, PhD, PEng

The Centre for Water Resources Studies was established in December, 1981, by a resolution of the Board of Governors. The objectives of the Centre are to carry out applied research which contributes to the effective and sustainable protection of water resources in Atlantic Canada, nationally and internationally, and to facilitate the transfer of new knowledge to potential users. Research programs directed by the Centre address the design of cost-effective

on-site wastewater systems, soil erosion processes, drinking water treatment, the use of roofwater cisterns for domestic water supply, eutrophication, watershed management, the computer modelling of hydrodynamic and hydrochemical processes, as well as topics in hydrogeology. In 1982 the Centre established the Halifax Urban Watersheds Program, a long-term study of a pair of watersheds near the Halifax city limits. This study focuses on the watersheds as a field laboratory for the study of the effects of urbanization on surface water quality and quantity. In order to better facilitate the development of relevant research programmes and the dissemination and application of research results, the Centre has memoranda of understanding with Environment Canada, the Nova Scotia Department of Environment, Fenwick Laboratories and the Dalhousie School of Resources and Environment Studies. The Centre also has a number of research advisory panels, which involve professionals from industry, government and academia in applied research related to water use and water management.

Facilities

The Centre for Water Resources Studies is located on the fifth floor of "D" Building of DalTech. Laboratory and office space is available for specific graduate research topics, as well as ongoing research carried out by Centre personnel. Analytical equipment includes instrumentation for determining low levels of major ions and nutrients, as well as trace quantities of metal ions in water. The Centre has apparatus for laboratory investigation and pilot scale testing of innovative water treatment methods using Dissolved Air Flootation (DAF) and ozonation and has worked with local consultants and municipalities to develop new applications of the technologies. The Centre is a North American leader in the development of on-site sewage disposal and has had an active research programme in this area since 1987. In addition to numerous field installations the Centre fully has functional laboratory installations that duplicate the behaviour of sloping sand

filters and septic disposal. The Halifax Urban Watershed (HUW) is the outdoor laboratory utilized by the Centre for much of its research. The HUW consists of 15 m² of watershed area containing five lakes. The lakes vary in the amount of development within their watersheds from completely undeveloped to completely developed and are, therefore, ideal for studying a variety of subjects related to urban areas. The HUW is located approximately five kilometers from campus and can be reached within ten minutes. This location makes it ideal for studies requiring frequent site visits.

Educational Opportunities

The Centre encourages applications from qualified graduates with experience in engineering and the science who have an interest in water resources research. Graduate programmes which are offered within the Faculty of Engineering include the Ph.D., Master of Applied Science, and Master of Engineering. The Centre also participates in the program leading to a dual degree in water resources engineering and planning in conjunction with the Department of Urban and Rural Planning.

Centre for Work and Health

Director: T.L. Maloney

The Centre for Work and Health was established as a partnership with the ultimate goal of providing expertise to Nova Scotian industries in the development of health and productive workplaces. The Centre provides a wide range of professional services ranging from proactive ergonomics assessments, education and recommendations, to immediate post-injury care, and when necessary, rehabilitative care of work hardening and work re-entry. The services offered include both on-site and in-clinic educational programmes focusing on safety, human capabilities and capacities, and workplace analysis and design.

The major goal of improving workplace health and productivity is served to a great extent by the application of ergonomic principles and concepts dedicated to the understanding and improvement of human performance.

In pursuit of its over-riding objective, the Centre for Work and Health plays three major roles:

- education of undergraduate and graduate students focusing on applied problems related to health and safety in the workplace;

- education of the members of workplace communities about the application of ergonomics for a safer and healthier environment; and
- application of a research capacity through applied and basic research in human motion analysis specifically related to the workplace and the efficacy of therapeutic interventions.

The approach to research in the Centre for Work and Health may be multiprofessional and/or multidisciplinary depending on the research problem.

Dalhousie Health Law Institute

Director: Jocelyn Downie, BA, MA, M.Litt., LLB, LLM

Associate Director: Colleen Flood, BA/LLB, LLM

Associate: Fiona Bergin, BA, LLB, MD, LLM

6061 University Avenue

HALIFAX, NS B3H 4H9

Telephone: (902) 494-6881

Fax: (902) 6879

E-Mail: hli@dal.ca

The Health Law Institute is an interdisciplinary Institute supported by and serving the Faculties of Law, Medicine, Health Professions, and Dentistry. The Institute provides teaching services to these four faculties at the undergraduate, graduate, and continuing education levels. Institute faculty also supervise graduate and undergraduate law students interested in writing about topics at the intersection of law and health care. Institute faculty conduct and facilitate research in health law both independently and collaboratively. There are particularly strong research links between the Institute and the Office of Bioethics Education and Research in the Faculty of Medicine. The Institute offers consultation services to various government agencies as well as public interest groups, the private sector, health care institutions and the media. Outreach activities include Institute promotion, international scholarly links and joint initiatives, and service to the University and to the broader community.

Marine Gene Probe Laboratory (MGPL)

Director: TBA

The Marine Gene Probe Laboratory (MGPL) was established at Dalhousie University in 1989 by a grant from the Province of Nova Scotia. The mandate of the MGPL is to apply genetic biotechnology to problems of critical importance in fisheries and aquaculture. The laboratory has its own in-house research programmes and collaborates closely with commercial firms and government agencies.

The MGPL acts as a centre for the development of genetic technologies, particularly DNA fingerprinting tools for commercially important fish and shellfish species. The MGPL is also a training centre and has hosted researchers from Belgium, Greece, Singapore, Norway, USA, the People's Republic of China and many areas of Canada. The MGPL participates in collaborative activities with the Research and Development programme at Dalhousie University, the Northwest Atlantic Fisheries Centre of the Department of Fisheries and Oceans and various commercial aquaculture and biotechnology firms.

Minerals Engineering Centre

Director: William F. Caley, PhD, CEng, PEng

The Minerals Engineering Centre was established by DalTech from the Laboratory for the Investigation of Minerals, formerly part of the Atlantic Industrial Research Institute. The Minerals Engineering Centre is intended to provide research, analytical and advisory services to industries, universities, and government bodies in Atlantic Canada. The Centre is located in G Building of DalTech, Sexton Campus which also houses the Department of Mining Engineering. The services offered include:

- Sample preparation of ores, soils, silts, rocks, cores and clay fraction
- Size analysis, including screening, sieving, and sub-sieve analysis
- Dense liquid analysis

- Preparation of thin sections
- Physical and chemical analytical methods using atomic adsorption, spectographic and wet chemical techniques
- Analysis of samples including geological, metalliferous ores, industrial minerals, coals, metals, alloys and water
- Mineral processing test work covering the whole range of investigative techniques from bench scale to pilot plant, including crushing, grinding, classification, gravity separation, dense medium separation, magnetic separation, electrostatic separation, flotation, flocculation, thickening, filtration, and drying

The Minerals Engineering Centre is closely linked with the Department of Mining and Metallurgical Engineering and provides opportunities for undergraduate and graduate students to learn various analytical and mineral testing techniques applicable in their course of studies. It also offers services to faculty members to assist in their teaching and research activities.

Further information may be obtained from the Director of the Centre.

Neuroscience Institute

Acting Director: R.E. Brown, PhD

The Neuroscience Institute was founded in 1990 to promote and coordinate research in neuroscience, the modern interdisciplinary study of the brain and nervous system. 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 Sir Charles Tupper Medical Building, 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 the Faculty 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.

The Nova Scotia CAD/CAM Centre

Location: 1360 Barrington Street
P.O. Box 1000
Halifax, B3J 2X4

Reception: 902 - 420-7764

Fax: 902 - 422-8380

Contact: Leigh Beauchamp Day, Business Development Manager
902 - 420-7770

Established: April 29, 1983, as a cost-recovery, industry oriented Centre within DalTech. It is affiliated with the Departments of Mechanical and Civil Engineering.

Mandate: As set out in an agreement with the Province of Nova Scotia, DalTech established an "industry-oriented CAD/CAM Centre to assist provincial manufacturers and consulting engineers to develop, design and utilize CAD/CAM applications". It has since expanded to include advanced composite-materials in bridges and structures and remote monitoring of innovative structures.

Director: Dr. Aftab A. Mufti, P.Eng.
420-7763

CAD Training & Applications Advisor

Mr. Gary Bustin

Assist. Director & Division Manager
420-7769

Mr. Andrew Harvie
CAD/CAM Engineer
420-7779

- Authorized AutoCAD Training Centre
- Applications support
- Communications; Data Exchange & CAD
- Hardware, software advisory service
- solid modelling
- civil and mechanical applications
- animation capability
- novel application

Design Engineering & Manufacturing

CAD/CAM Engineer: Mr. Robert Warner, P.Eng.
420-7841

- CNC application research
- Prototype development
- Equipment consultation
- Coordinate Measuring Machine Services
- Insertion Moulding
- CADkey and SmartCAM
- irregular forms
- variety of metals and advanced engineering materials
- solid modelling/3D design
- Design & fabrication methods advice
- Advisory Service for: flow analysis, mold design analysis, thermosets, thermoplastics, reinforced plastics, compression moulding, etc.

Mr. Warner also teaches the mechanical engineering class MECH 4631.03 CAD/CAM where DalTech students are introduced to manual CNC programming and SmartCAM.

Advanced Composite Materials (ACM) in Bridges and Structures Technical Implementation Officer: Mr. Mike Mahoney, E.I.T. 420-7763

Manager: Dr. John Newbrok, P.Eng.

- R&D in ACM with wood and concrete
- Finite Element research
- FE training
- CAE advisory service
- Trade Missions
- International Conference Organization
- Operates ACMRS Network
- Operates ISIS - Halifax
- fracture mechanics
- crack propagation
- bearing shaft design
- stress and impact problems
- construction: buildings, bridges, ships and aircraft
- composite and advanced materials
- innovative structures and remote monitoring of structures

Advanced Composite Materials in Bridges and Structures

The Advanced Composite Materials in Bridges and Structures (ACMBS) Division was established in 1989 to serve a need in the engineering, design and construction industries with respect to the application of advanced composite materials in bridges and structures. The Centre works closely with the Advanced Materials Engineering Centre (AMEC) for their testing expertise.

Business Development

Contact: Ms. Leigh Beauchamp Day, 420-7770

- Industry contacts
- Training coordination
- Industry surveys
- Seminar & event coordination
- Information dissemination
- Proposals & contracts
- Public Relations

Equipment & Software Available for Industry and Daltech' Use

- PC based application software includes: AutoCAD (Release 14), SmartCAM, ALGOR, SolidWorks (3D CAD Modelling Programme) and AutoDESK 3D Studio VIZ (3DS VIZ), solid modelling software-Pro-Engineer
- CNC milling centre Mori-Seiki MV Junior 3-axes
- CNC turning centre lathe Mori-Seiki SL-25
- Co-ordinate Measuring Machine (CMM), Mitutoya measuring range of 13" x 20" x 12"
- Impact testing machine Tinius Olsen Izod - Model 66
- "Roughness" measuring gage unit, Scarface finish
- Remote control color copier Tektronix Phaser II
- CNC milling machine Easymill-3 2 1/2 axes (for training purposes only)
- Injection Moulding Machine 25 Ton Engel 1.2 oz
- Manual try-out plastic injection press
- 9 Personal Computers (486, Pentium)
- Plotters - HP Design Jet 250

Technology Transfer Activities

- contracts from and joint ventures with companies, industry and government
- training programs for industry and government
- technical and application advisory service
- research and development
- technical services
- prototype development
- use of facilities

Actively Seeking

- collaborative projects
- temporary transfer of staff to companies
- temporary transfer of company staff to the Centre
- access to specialized equipment and facilities
- an expansion of the items listed under Current Activities above

Affiliations with Other Organizations

The Centre has an excellent working relationship with other organizations throughout the Province, including: the University College of Cape Breton and Innovacorp. It also has access to CAD/CAM, robotics, industrial, computer science, mechanical and civil engineering expertise within DalTech.

Member of:

- Society of Manufacturing Engineers
- Nova Scotia Entrepreneur's Forum
- National Agency for Finite Element Methods and Standards in the United Kingdom
- Canadian Network of Advanced Manufacturing Research
- Canadian Plastics Institute
- Society for Plastics Engineers

Supported by:

- The National Research Council Industrial Research Assistance Program (IRAP) and Canadian Technology Network (CTN)
- ISIS Canada (NSERC)
- Canada/Nova Scotia Cooperation Agreement
- Industry Canada

Trace Analysis Research Centre

Director: L. Ramaley, BA, MA, PhD

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

Vehicle Safety Research Team

Director and Principal Investigator: C.R. Baird, PhD, PEng

The Vehicle Research Safety Team (VSRT) is one of eight university-based teams located across Canada. These teams operate on a non-profit basis under contract to Transport Canada (Surface), and were established to conduct research into vehicular crashes.

The VSRT has been in operation at DalTech since 1972 and, in addition to participating in national programs, has been involved in several other studies, including an on-going and expanding programme of seeking out and examining alleged safety-related defects. The major portion of the programme is geared to relating injuries from vehicular-crashes to the injury-causing mechanisms or sources in vehicles. As such, results of accident studies are continually being related to Transport Canada Vehicle Standards.

The team is composed of two professional engineers from the Faculty as well as two full-time investigators, one of whom is a professional engineer. In addition, an advisory committee exists, providing liaison and interaction with medical personnel, policing agencies and provincial transportation authorities.

The VSRT has special research interests in casual factor evaluation methods, in computer-aided accident reconstruction, in data base management and modular analysis procedures, particularly in relation to injury severity and injury-casual factors.

Resources and Services

1. Advisory Committee on Sexual Harassment

Sexual harassment is sexually oriented behaviour of a deliberate or negligent nature that adversely affects the working or learning environment or participation in university life. Sexual harassment can take many forms, from constant joking to assault. It may involve promises of reward, or threats that you could fail in class or lose your job. It may make your work or study environment uncomfortable through continued sexual comments, suggestions or pressures. Sexual harassment may involve unwelcome sexual attention from a professor, a teaching assistant, a staff member, a student, or even a patient or a customer.

Dalhousie University is committed to an environment free from sexual harassment. A policy and procedures exist to deal with complaints of sexual harassment. Responsibility for monitoring the policy and coordinating educational programming rests with the President's Advisory Committee on Sexual Harassment, which includes representation from student, staff and faculty groups.

If you believe you are being sexually harassed at Dalhousie you are encouraged to discuss your questions or concerns with the Sexual Harassment Advisor, Room #3, Basement of the Arts and Administration Building, 494-1137. Advice and information about the policy and possible options are available.

Persons found to have engaged in sexually harassing behaviour can be subject to a range of penalties, up to and including expulsion or dismissal from the University.

2. Alumni Association

The Alumni Association is comprised of over 70,000 graduates of Dalhousie University. A strong global network of volunteers keep alumni informed and involved with the Association. By providing many programs and services, the Association fosters a strong relationship between Dalhousie and its alumni.

Dalhousie alumni play a vital role in the health and future of the university. Because of their leadership, Dalhousie enjoys a strong pool of applicants to its academic programs each year. Many graduates return to Dalhousie regularly to hire our newly minted students. They also advance the position of Dalhousie as advocates, ambassadors, and student mentors. And the financial support provided by our graduates ensures that Dalhousie will be here in the years to come to serve future generations of Nova Scotians and Canadians.

Formed in 1920, just ten years after the University graduated its first class of ten men, the Alumni Association boasted an initial membership of 33. Today, over 10,000 graduates of engineering, architecture and computer science are members of the Association. The Association is governed by an Alumni Council elected from among its membership with four Alumni elected as members of the University's Board of Governors. Day-to-day administration of the Association is carried out by the office of Alumni Affairs. Branches of the Alumni Association have been formed in Calgary, Edmonton, Fort McMurray, Halifax, Montreal, Ottawa, St. Johns, Toronto, Vancouver, Hong Kong and Malaysia.

Support of students and their activities has always been a priority for the Alumni Association. Alumni-sponsored construction projects include M.M. O'Brien Hall, F.H. Sexton Memorial Gymnasium and the University's Student Centre. The Association supports student projects, athletics and other student needs.

3. 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 are 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, two hardwood basketball courts, numerous "no-fee" racquet courts, and an indoor jogging track, a golf putting green and driving cage, a cardio-fit area and family-fitness features such as the Fun Zone play area (the largest indoor soft modular play structure in Metro), a babysitting service, and our Family Change Room; the Dalhousie Memorial Arena, Studley Gym, and The F.B. Wickwire Memorial Field (one of the largest artificial playing surfaces in the world). For details on fitness and recreation at Dalhousie contact Dalplex at 494-3372 or the Intramural Office at 494-2049.

4. Black Students

The Black Student Advising Centre is available to assist and support new, prospective and returning Black Students (African, American, Canadian, Caribbean, etc.) The Advisor may organize programme activities which assist Black students in developing contacts with other Black students both on campus and in the Black community. The Centre is intended to foster a sense of support and community among the Black students, with other students and to increase intercultural awareness.

The Advisor will provide confidential services and programmes individual and/or group assistance, impartial observation, relevant resource materials, along with a referral service which may benefit your academic, personal and social development on and off campus. There is a small student resource room for meeting, peer support, reading and/or studying. Awards, scholarships, employment, community information and upcoming events are also made available.

The position of the Black Student Advisor was created by Dalhousie University to provide information to prospective students, increase access and promote retention of indigenous Black students.

The Centre may be beneficial to all students, faculty and staff as a means of increasing awareness and sensitivity to Black student issues and presence within the University community.

For further information contact: Office - Black Student Advisor, Student Union Building, Halifax, Nova Scotia, B3H 4J2; phone - (902) 494-6648; fax - (902) 494-2042; World Wide Web homepage URL <http://is.dal.ca/~bsac>, E-mail: BSAC@Dal.Ca.

5. 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 Latter Day Saints 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 in Room 418 on the fourth floor of the Student Union Building, telephone 494-2287. Office hours are posted on the office door. 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.

6. Continuing Education Division

DalTech offers a variety of continuing education programmes for engineers, architects, computer scientists and other technical professionals. The administrative unit responsible for these activities is the Continuing Education Division (CED). The programmes offered include seminars, short courses and certificate programmes. Within the mandate of DalTech, the mission of CED is

to provide needs-driven, leading edge technical training and certificate programmes to the industrial and business community, government, defence personnel and technical professions.

Requests from DalTech Alumni to offer a large variety of programmes closer to their homes led to the development of a national programme. CED now takes an active role in offering continuing education training programmes across Canada. DalTech offers the only national programme of its kind in Canada.

CED maintains a close liaison with business, industry, government, defence personnel and technical professions to ensure training needs are being met now and for the future.

7. 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, Overcoming Procrastination, Anger Management, 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.

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. In addition to regular office hours, the Centre is open three evenings a week during the academic year. Inquire or make appointments by dropping in or calling 494-2081.

8. Dalhousie Arts Centre

Designed as a multipurpose facility, the Dalhousie Arts Centre is home to four University departments: Dalhousie Arts Centre (Rebecca Cohn Auditorium), 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 Chieftains, 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.

9. Dalhousie Tutoring Service

The Dalhousie Tutoring Service provides "fee for service" subject tutoring to both university students and students in the wider Halifax community who require academic assistance. The Service's tutors are senior baccalaureate and masters scholars from Dalhousie, DalTech and Education degree programmes. Tutors are also available to provide help with professional school entrance exams, English as a second language, elementary or high school level students. Tutoring is offered during the regular academic year and during the summer session. The Dalhousie Tutoring Service Office is located in the 4th floor offices of the Student Employment Centre in

the Dalhousie Student Union Building on University Avenue. For more information, please contact the Dalhousie Tutoring Service Coordinator at 494-3300 or send an e-mail to: tutor@is.dal.ca.

10. 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, a number of other constituency groups are represented on the Council because they are uniquely affected by many campus issues. 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 at 6136 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. The Student Union Building provides a wide range of services for students including the Student Advocacy Service, Travel Cuts, The Grawood, a Housing Board, and much more. Every student has the opportunity to take advantage of the Union's financial, physical and organizational resources. Students have an opportunity to become involved in committees dealing with various student issues. The DSU also offers over 100 clubs, societies and organizations for students to participate in. All students are invited to satisfy their curiosity by visiting the Student Union Council offices. 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.

11. 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 low. It is therefore very important that students planning to attend Dalhousie/DalTech think well in advance about their accommodation needs.

Students should be aware of the following points in reference to residence accommodation. You must indicate your interest in residence accommodation on your Application for Admission to a programme of study. Upon admission to a programme of study, those students who have indicated an interest will receive a Residence Application Form. It is important to return the Residence Application Form promptly as the applications will be considered as they arrive. Residence Application Forms will not be distributed to, nor received from, individuals who have not gained admission to a programme of study.

Students with disabilities are encouraged to contact the Residence Office at (902) 494-1054, 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. All students living in traditional style residences are required to participate in one of the meal plan options available.

The information below gives a description of 1. traditional on-campus residences, 2. non-traditional on-campus housing, 3. off-campus housing owned by the university, 4. the services offered by the off-campus housing office listing service and 5. general information. 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.

As available space in University residences is limited students are encouraged to complete and submit their residence application immediately upon receiving it with their letter of academic admission.

I. Traditional Style On Campus Residence

A) Main Campus

i) Howe Hall

Centrally located on campus, Howe Hall, provides accommodation for 524 undergraduate students. The sprawling, grey ironstone complex is divided into five houses: Bronson, Henderson, Smith and Studley Houses are co-ed; Cameron is for men only. Each house has its own distinctive identity and student government. The ratio of seniors to first-year students is approximately 40/60, except in Henderson house which is predominantly for first year students.

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 room.

ii) Shirreff Hall

The women's residence on the Dalhousie campus, Shirreff Hall, provides accommodation for 444 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 three houses - Newcombe, Old Eddy and New Eddy (which includes the Annex). Old Eddy and New Eddy have both single and double rooms while Newcombe has 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 areas, computer rooms, games room, television lounges, exercise room, kitchenettes, canteen, laundry room and reception desk. Students have access to two pianos.

iii) 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.

This three-storey building 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) DalTech Campus

i) O'Brien Hall

M.M. O'Brien Hall is centrally located at the corner of Morris and Barrington Streets. Unlike many modern University residences, this seven storey brick building is small and exudes an atmosphere of friendliness. Accommodation is available for 134 students. Each residence floor includes two kitchenettes, two large washrooms, twelve single, five double rooms, and one RA's room. The main floor has a T.V. lounge, student dining hall and kitchen facilities.

2. Non-Traditional On-Campus Housing

A) Main Campus

i) Glengary Apartments

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

Glengary has 12 furnished apartments, each with space for three/four students. The apartments may be arranged as three single rooms, or two singles and a double room. Each apartment includes a 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.

ii) Co-ed Apartment Units

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

iii) Residence Houses

Dalhousie also has six residence houses, three 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 45 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 Co-ordinator to provide administrative and resident-related services.

B) DalTech Campus

i) Graduate House

This facility houses 14 post-graduate students, all in single rooms, and is located beside O'Brien Hall.

Two options are available to graduate students. They are:

- 1) Room with meal plan;
- 2) Room without meal plan.

3. Off-Campus, University-Owned Housing

A) Fenwick Place

Dalhousie's 33-storey Fenwick Place offers students the privacy and some of the independence of apartment living. Located in south end Halifax, 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.

4. 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, shared accommodations, rooms, condos and houses. Up-to-date computerized printouts of these listings are available for viewing as well as telephones for calling landlords and material such as maps and transit schedules.

Off Campus Housing has a new Web site:

<http://adminweb.ucs.dal.ca/housing/loc.htm>. You can search for accommodations as well as list your own place. The Web site is updated twice weekly on Tuesday and Thursday.

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.

5. 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.
- Acceptance into an academic programme does not mean that application for a place in residence has been approved.
- 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

Location: 6250 South Street
Dalhousie University
Halifax, N.S. B3H 3J5
Telephone: (902) 494-3365

Howe Hall, Eliza Ritchie Hall, Shirreff Hall and the Residence Houses:

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

For Fenwick Place, Glengary Apartments, Co-ed Apartment Units, O'Brien Hall, Graduate House:

Location: Accommodation Office
Fenwick Place
Dalhousie University
5599 Fenwick Street
Halifax, N.S. B3H 1R2
Telephone: (902) 494-2075

For Off-Campus Housing Assistance:

Location: Off-Campus Housing Office
Student Union Building
Room 410
Dalhousie University
6136 University Avenue
Halifax, N. S. B3H 4J2
Telephone: (902) 494-3831

12. Instructional Development and Technology

The Office of Instructional Development and Technology (OIDT) is mandated to initiate, lead, and coordinate activities which encourage reflection upon and improvement in teaching and learning at Dalhousie.

Workshops - To fulfil this primary goal, the OIDT develops and presents a variety of sessions and workshops to faculty and teaching assistants at Dalhousie. Annual events include the Orientation to Teaching at Dalhousie for new faculty and the Celebration of Teaching lecture and reception. During the year, workshops are presented monthly or bi-monthly and are open to the Dalhousie community. The OIDT also cooperates with other universities in Nova Scotia to disseminate information about teaching improvement.

Publications - Focus on University Teaching and Learning, the OIDT newsletter, is published five times a year. Three other publications - Recording Teaching Accomplishment: A Dalhousie Guide to the Teaching Dossier; University Teaching and Learning: An Instructional Resource Guide for Teaching Assistants at Dalhousie University; Learning Through Writing: A Compendium of Assignments and Techniques - may be purchased or borrowed from the OIDT. The extensive bibliography of materials available for loan includes both print and video resources on topics related to teaching. These may be borrowed by faculty, teaching assistants, and students.

Instructional Media Services - To complement its primary goal, the OIDT also has responsibility for the provision of instructional media services to the campus (excluding Medicine and Dentistry). These services include audio-visual equipment, videotaping, photography, and graphics. Facilities for borrowing discipline-specific audio and video tapes are located in the Learning Resource Centre in the basement of the Killam Library.

Distance Education - Through its support for the development of distance education classes, primarily in the Health Professions, the OIDT assists Dalhousie to respond to the needs of those who wish to upgrade their education. General inquiries about these classes should be directed to the Registrar's Office.

Information, teaching resources, and private consultations are available through the Office of Instructional Development and Technology. The Office is located in the Killam Library Courtyard (494-1622).

13. International Student Advisor

The International Student Advisor provides services and programmes for Dalhousie's students from around the world, serves as a resource for international students, and is dedicated to insuring that international students make the most of their stay in Canada.

This includes the provision of information and advice on financial, legal, immigration and personal matters, and referrals to other services on campus. The Advisor 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, and the Advisor coordinates activities that facilitate fostering of relationships with the university and city communities.

At Lester Pearson International there is a lounge where students can meet and a reading room where students can study or read international publications. For further information, contact:

International Student Advisor, Lester Pearson International, Dalhousie University, 1321 Edward Street, Halifax, N.S., Canada, 83H 3H5, phone (902) 494-7077, fax (902) 494-1216.

14. Lester Pearson International (LPI)

Director: P. Rodee, BA, MBA

Associate Director (External Development): R. Eagle, BEng, MBA, PEng

Institutional Advisor: A. Sinclair, BA, MA, PhD

Lester Pearson International (LPI) was founded in 1985 to promote Dalhousie's involvement in international development activities. In mid-1987, LPI merged with the Centre for Development Projects and was given responsibility for the guardianship of all externally-financed international development programmes and projects at Dalhousie. In mid-1994, LPI's mandate was expanded to include a broader responsibility for international activities and for providing leadership in the internationalization of the university.

In general, LPI supports the Dalhousie community's involvement in international activities. Towards this end, LPI helps to develop, support and oversee the university's international projects; facilitates and supports Dalhousie's student exchange programs; coordinates a development education programme entitled DAL-Outreach which organizes and sponsors seminars, talks, conferences and events; hosts many official international visitors and delegations to the university; disseminates information to both students and faculty members concerning international activities and opportunities; and serves as the International Liaison Office/r (ILO) for the university. Although LPI is not a degree-granting arm of the university, it encourages and supports the study of international issues; serves as a resource centre for students, faculty and staff; and maintains a roster of associates known as Pearson Fellows who serve as advisors in their particular area of expertise. LPI is located at 1321 Edward Street (on the corner of University Avenue, across from the Law School on Edward).

15. 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, the Kellogg Health Sciences Library, and DalTech Library.

As of April 1, 1996, the total Dalhousie University Library System holdings include over 1,650,000 volumes of books, bound periodicals, documents, and bound reports, 496,000 microfilm & microfiche, 100,000 maps, and other media. Approximately 9,550 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, University College of Cape Breton, University of King's College, the Atlantic School of Theology and St. Francis Xavier University). Users borrow from Novanet libraries upon presentation of their University ID card.

DalTech Library provides access to the world's engineering, architecture, computer science, and related information for students, faculty, researchers and practitioners. Located on the third floor of the Administration Building, the main Library collection consists of over 100,000 volumes of books, bound periodicals, government documents and technical reports, as well as over 82,000 publications in microform. The Library has current subscriptions to 800 periodicals and a full set of DalTech Theses. An extensive collection of standards and specifications is held in the library including those of the Canadian General Standards Board and the American Society for Testing and Materials. The collection covers the fields of architecture, computer science, energy and environmental studies, engineering, fisheries, food sciences, naval architecture, planning, and other areas related to the university programmes.

A Resource Centre located in the Faculty of Architecture Building contains several thousand slides and other multi-media resources related specifically to the architectural studies programmes.

DalTech Library participates in Novanet, a network which shares an automated on-line catalogue containing the holdings of the member libraries (Mount Saint Vincent University, Nova Scotia College of Art and Design, Saint Mary's University, St. Francis Xavier, University College of Cape Breton, University of King's College and the Atlantic School of Theology). DalTech students, faculty and staff have direct borrowing and use privileges at all Novanet member libraries.

In addition to printed information resources, the Library offers many resources in electronic form. The Library's local area network of microcomputers provides free access to a wide range of items including databases, indexes, directories, image collections and manuals. There is also a full text imaging workstation containing all of the publications of the Institute of Electrical and Electronic Engineers and the Institution of Electrical Engineers from 1988 to the present. Access to relevant internet resources such as catalogues of other university libraries and international databases is provided through the Library's World Wide Web home page (<http://www.tuns.ca/~library>). To supplement the information held at DalTech, on-line database searching of over 2,000 other databases is available at cost. Full text of this material is provided by document delivery service that reaches a network of research collections in North America and around the world.

16. Ombudsperson's Office

The Dalhousie Ombudsperson's Office offers assistance and advice to anyone experiencing problems with the Dalhousie community, including difficulties associated with finances, academics, or accommodations. This student run office can help resolve particular grievances and attempts to ensure that existing policies are fair and equitable. Jointly funded by the University and the Dalhousie Student Union, the Ombudsperson can provide information and direction on any University-related complaint. Clients retain full control over any action taken on their behalf by the Ombudsperson's Office, and all inquiries are strictly confidential.

The Dalhousie Ombudsperson's Office is located in the Student Union Building, Room 442. Regular office hours are posted on the door at the beginning of each Semester. The Ombudsperson's Office can also be reached by calling 494-6583. If no one is available to take a call, a message may be left on voice mail.

17. 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.

18. 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 cooperation 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) 494-2936, TTY (902) 494-7091.

19. 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 receives 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:

Location: Student Advocacy Service
Room 402
Dalhousie Student Union Building
Telephone: (902) 494-2205

20. Student Clubs and Organizations

Students seeking information on clubs and societies should call the Dalhousie Student Union offices at 494-1106 or check the DSU web page at www.dal.ca/~dsu. 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.

21. Student Employment Centre

The Dalhousie Student Employment Centre assists Dalhousie students in their efforts to obtain permanent, summer, or part-time employment. Positions are posted on the bulletin board and on our web site: <http://is.dal.ca-sec/>. The Centre is located on the fourth floor of the Student Union Building, and operates Monday through Friday from 9:00 a.m. to 4:30 p.m. Telephone: (902) 494-3537, E-mail: sec@is.dal.ca. The Employment Centre also has useful information on resume preparation, interview techniques, and job-search skills as well as reference materials about international opportunities and recruiting companies. Interviews for graduating students are arranged with 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. The Centre promotes Dalhousie students to employers nationally and internationally and follows the guidelines for ethical recruitment of the Canadian Association of Career Educators and Employers.

22. Student Services

Located at 1234 LeMarchant Street, Student Services provides a point of referral for any student concern. The Vice-President is the chief student services officer and coordinates the activities of Athletics and Recreational Services, Dalplex, Bookstore, Counselling and Psychological Services, Health Services, Housing and Conference Services, Office of the Registrar, Writing Workshop, Office of the Ombudsperson, Student Service Centre, and Student Resources including Black Student Advising, Advisor to Students with Disabilities, Chaplaincy, International Student Centre, Student

Employment Centre, Tutoring Service and the Student Volunteer Bureau. Students who experience difficulties with their academic programmes or who are uncertain about educational goals, major selection, honours or advanced major information, degree regulations, changing faculties, inadequate study skills, or conflicts with faculty and regulations, can seek the assistance of the Academic Advisors in the Vice-President's Office.

23. Student Volunteer Bureau

The Dalhousie Student Volunteer Bureau acts as a link between students looking for volunteer opportunities and a broad range of campus and community organizations. Students' skills, interests, and academic field can be matched with volunteer positions in more than 200 organizations throughout Metro Halifax. Overseas information and a resource library are also available. The Fall Volunteer Fair brings dozens of community organizations onto campus to inform students of current volunteer opportunities. The Bureau is open to any interested university student. The Volunteer Bureau is located on the fourth floor of the student.volunteer.bureau@dal.ca.

24. 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. As well, you can find an assortment of magazines, newspapers 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 specially ordered annually, and the department ships out books to consumers and hospitals throughout the world.

The Stationery department carries all necessary and supplementary stationery and supplies. The Campus shop carries gift items, mugs, clothing and crested wear, cards, jewellery, class rings, backpacks, novelties and briefcases. A Special Order department is located at the customer service area and will order and ship books worldwide.

The Bookstore is situated on the lower level of the Student Union Building on University Avenue, and is open year round, Monday to Saturday (Hours vary throughout the year).

The DalTech bookstore supplies Daltech-required and reference books as well as DalTech crested clothing, stationery and other supplies. In addition, magazines and greeting cards are available. The DalTech bookstore is located in Building "A", 1360 Barrington Street on the DalTech campus. It is open year-round, Monday to Friday, 8:30 a.m. to 4:30 p.m. (Subject to change.)

25. 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 ISNet, which in turn is connected to the national network CaNET which has worldwide Internet connections. UCIS is also responsible for University telephones.

Central computer systems include three IBM RS/6000 computers which are used primarily for academic purposes; an IBM RS/6000 SP2, which is a powerful parallel processing system used for research; and an IBM 4381 and two IBM RS/6000 computers supporting the university's central administrative systems. In cooperation with the relevant academic departments, UCIS also supports numerous micro computer teaching laboratories which are situated throughout the campus, including laboratories in the School of Business, English, History, Sociology, Law, Music, Political Science, Physics, Biology, Earth Sciences, Dentistry,

Psychology, the Computer Centre in the basement of the Killam Library and at DalTech. It is strongly recommended, however, that students have access to a personally owned microcomputer with Internet access, especially for word processing, personal e-mail and WWW use, as most university facilities are heavily used for discipline-specific class work.

All students may have access to campus computing facilities on an individual basis or in conjunction with the classes that they take. Network ports for personally used computers are available in several of the large computer labs, and also in rooms of several university residences.

UCIS also manages the campus computer store (PCPC); provides short, non-credit computer related classes in conjunction with Henson College, offers a hardware maintenance service for microcomputers, and operates a digital multimedia facility (DMC).

UCIS Help Desks are operated in the Computer Centre basement of the Killam Library, and in B Building, ground floor, at DalTech adjacent to the Student Service Centre.

26. University Health Services

The university operates a medical clinic, in Howe Hall, at Coburg Road and LeMarchant Street staffed by general practitioners and two psychiatrists. Further specialists' services are available 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.

All students must have medical and hospital coverage. 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 Student Accounts office prior to registration. Any student who has had a serious illness within the last 12 months, or who has a chronic medical condition, should contact and advise the Health Service; preferably with a statement from the doctor.

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

27. Writing Workshop

The Writing Workshop programme recognizes that students in all disciplines are required to write clearly to inform, persuade, or instruct an audience in term papers, laboratory reports, essay examinations, critical reviews and more.

This English language resource centre offers non-credit classes in language and writing, including instruction and practice in English for speakers of other languages (ESOL), a tutorial service, guidelines for acceptable standard language usage, and provides information about sources for reference. For more information about the Writing Workshop, please call 494-3379.

Fees

Student Account Office

Mailing Address: Arts and Administration Building (Room 29)
Halifax, NS B3H 4H6

Service Location: Studley Campus - Basement A&A Bldg.
Sexton Campus - DalTech Student Service Centre

Telephone: (902) 494-3998

Fax: (902) 494-2848

E-mail: Student.Accounts@Dal.Ca

Office Hours: Monday to Friday 10:00 a.m. - 4:00 p.m. (or by appointment)

1998-99 Important Dates

September

- 4 Last day to register for fall term and regular session without a late fee
Fees due for fall term and first instalment for regular session
- 25 Last day for complete refund of first term or regular session fees

October

- 9 Last day for partial refund

November

- 3 \$50 reinstatement fee assessed on all outstanding accounts over \$200

January

- 18 Last day to register for winter term without late fee
Fees due for second term
Last day for complete refund, second term

February

- 1 Last day for partial refund if registered in second term and regular session.
- 1 Second instalment of regular session fees due.

March

- 2 \$50 reinstatement fee assessed on all outstanding accounts over \$200

I. Introduction

The following 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, winter and regular 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. Students wishing to register for the Summer Session in the Faculty of Architecture, Computer Science or Engineering should consult the 1997/98 Dalhousie DalTech calendar.

All fees are subject to change by approval of the Board of Governors of Dalhousie University. An Academic Fee Schedule will be available with the registration package. A list of miscellaneous fees is included in Table I.

NOTE: The student tuition fees and other fees that are published herein are applicable only to regular students admitted to a programme through the normal application process. Other students who are admitted to Dalhousie under a special programme or policy will be charged a different tuition fee and different other fees in accordance with such special programme or policy. For further information regarding any fees to be charged to students who are admitted to Dalhousie under a special programme or policy, please contact Student Accounts or the Dean of the faculty.

Students should make special note of the Academic Dates contained in the front section of the calendar. 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.

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.

II. University 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, interact, negotiable cheque, or money order.
- 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.
- Invoices 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, interact, certified cheque, or money order is required for payment of any account in arrears beyond the current academic year.

A. Admission Deposit - Limited Enrolment Programmes

A non-refundable 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.

Limited Enrolment Programmes include:

- Master of Business Administration
- Master of Environmental Studies
- Master of Library and Information Studies
- Master of Public Administration

All programmes in the following faculties:

- Faculty of Dentistry
- Faculty of Health Professions
- Faculty of Law

Further information on the regulations governing the refund of admission deposits is contained in Table III and IV.

B. Registration

A student is considered registered only after financial arrangements have been made with Student Accounts.

All students:

- Must submit to the Student Accounts on or before the specified registration dates the appropriate payment unless they are receiving a scholarship, fellowship, Canada Student Loan, a fee waiver, or their fees are paid by external organizations;
- Those holding external scholarships or awards paid by or through Dalhousie University must provide at registration documentary evidence of the scholarship or award;
- Those whose fees are to be paid by a government or other agency must provide a signed statement from the organization at registration. (PLEASE NOTE: Upon request, account status information will be made available to the sponsor.)
- 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 19. A late registration fee and/or interest will be charged after September 19. Failure to comply or arrange an alternative method of payment may result in deregistration.)
- those whose fees are paid by a Dalhousie University staff tuition fee waiver must present the approved waiver form and pay applicable incidental, auxiliary and ancillary fees at time of registration.
- 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, auxiliary, and ancillary 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.

C. 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 regular session fees or term fees.

D. Health Insurance

International students must purchase the Dalhousie International Health Insurance Plan or provide proof of private insurance coverage before registration.

Health Insurance - International Students (1997/98 fees, for information only)

- Single - \$339.00
- Family - \$678.00

Canadian students in the Faculties of Architecture, Computer Science or Engineering pay a compulsory health insurance plan. Students in all other programmes have the option of purchasing a health insurance plan through the Dalhousie Student Union.

E. Academic Fees

The 1998-99 academic fee schedule is not yet available. In order to provide some indication of the fee requirements, Table II and Section III show the 1997-98 fees. Once fees are approved for 1998-99, a complete schedule showing total academic fees and the minimum instalments will be made available. The official schedule will be included in the registration package.

Academic fees are comprised of:

- The tuition fee;
- An incidental fee comprised of Student Union, Society and Athletic fees, Capital Campaign or Building Fund;
- Auxiliary fee (specified Music, Theatre and/or Dance classes, Diploma Costume Studies programme and Graduate Studies Programmes in management studies);
- Ancillary fee (Specified Science classes and programmes in Faculty of Architecture);
- Co-op fee if applicable;
- Differential fees (International students only, see G. Below)

Students in the Faculties of Architecture, Computer Science, and Engineering should also refer to Section III - DalTech Fees, page 409.

For purposes of this section of the Calendar, a full-time undergraduate student is one who is registered for the regular session 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 have cost implications, often beyond what students expect. 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.

NOTE: 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.

F. Payment

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

For the convenience of students, registration material and non-cash payments are accepted by mail. Registrations with cheques post-dated to September 4, 1998 will also be accepted. Please allow sufficient time to ensure that material sent by mail is received on or before the specified dates.

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 Class Changes, Refunds and Withdrawals:

- a) Should students in the regular session prefer to pay in two instalments, the first instalment is due on or before Sept. 4 and the second instalment is due Feb. 1.
- b) Students registering for either the fall or winter terms only must pay fees on or before Sept. 4 and Jan. 18, respectively.
- c) Scholarships or awards paid by or through Dalhousie University will be applied to tuition and residence fees.
- d) When Canada Student Loan, Provincial 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) Any payments received will first be applied to overdue accounts.

G. International Students

A. Non-DalTech Students

Registering students 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 \$2700.00. Students registering in their current programme which commenced prior to 1994-95 academic year will pay a differential fee of \$1700.00. There is a proportional charge for part-time International students. The differential fee is payable with the first instalment of fees each year. Graduate Students please see Section 4.6 of the Graduate Studies Calendar to determine the number of years a student is required to pay the differential fee.

B. DalTech Students

International students in the Faculties of Architecture, Computer Science and Engineering who are not Canadian citizens or permanent residents are required to pay a "Differential Fee" in the amount of \$1865 per term to a maximum of \$3,730 per academic year. There is a proportional charge for part-time International students.

H. Audit Classes

Full-time students, except those in the Faculties of Architecture, Computer Science and Engineering, may audit classes which relate to their programmes without additional fees except where auxiliary fees apply. Full-time students in the Faculties of Architecture, Computer Science, or Engineering and part-time students in all faculties auditing a class pay one-half of the regular tuition plus auxiliary fees, if applicable. 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 their registration to 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.

I. Class Changes, Refunds and Withdrawals

Please consult Student Accounts for all financial charges and the Office of the Registrar for academic regulations. Also refer to Tables III and IV for refund calculation.

Refund Conditions

NOTE: Non-attendance does not constitute withdrawal.

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

- 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. 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 or foreign 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 be made to the Bank if a student has received a Canada or Provincial Student Loan.
- f) Refunds will be prorated on fees paid by Scholarships and/or Fee Waiver.
- g) A valid Dalhousie University ID must be presented in order for the student to receive a refund cheque.
- h) No fee adjustment will be made for a student changing their degree or programme in the regular session after September 25.

J. Delinquent Accounts

Accounts are considered delinquent when the balance of fees has not been paid by September 25 (January 18 for students registered for the winter term only). Where payment in two instalments is permitted, the remaining balance is due February 1 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 0.65% (7.8% 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. 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 April 15 may not be eligible, at the sole discretion of the University, for graduation at the May convocation. For October graduation the date is September 1.

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.

K. 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. A late fee of \$50.00 will apply if the loan is negotiated after September 25, 1998. (January 18, 1999 for students registered for winter term only.)

L. 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 Registrar's Office - Information Centre located on the first floor of the Arts & Administration building, Room 123. Telephone (902) 494-6557.

TABLE I: Academic Fees 1997-98 Excluding Architecture, Computer Science and Engineering (please refer to DalTech Fees, pg. 409)

The 1998-99 academic fee schedule is not yet available. In order to provide some indication of the fee requirements, this table shows the 1997-98 fees. Once fees are approved for 1998-99, a complete schedule showing total academic fees and the minimum instalments will be made available. The official schedule will be included in the registration package.

Faculty/Programme	Total Tuition Fee	Student Union Fee	For information only, 1997-98 figures		
			Student Union Cap. Campaign & Facilities Fee	Society Fee	Athletic Fee
Underegraduate					
Arts & Social Sciences ⁽¹⁶⁾					
Full-time ⁽¹⁾	3,655	75	35	10	75
Full-time term ⁽⁸⁾	1,830	75	35	--	75
Part-time ⁽⁹⁾					
3 Credit Classes	2,250	75	35	10	75
1 Credit Class	750	30	25	--	--
½ Credit Class	375	15	25	--	--
Auxiliary Fees					
Costume Studies (yearly programme fee)	500	--	--	--	--
Music(per specified class)	750	--	--	--	--
Theatre Arts (per specified class)	250	--	--	--	--
Ancillary Fee (specified Science classes and programmes in Faculty of Architecture)					
½ Credit Class(3 credit hours)	11	--	--	--	--
1 Credit Class (6 credit hours)	22	--	--	--	--
SCIE 1500.30R Class (30 credit hours)	50	--	--	--	--
Science (Except Engineering)					
Full-time ⁽¹⁾	4,190	75	35	15	75
Full-time term ⁽⁸⁾	2,095	75	35	--	75
Part-time ⁽⁹⁾					
3 Credit Classes	2,520	75	35	15	75
1 Credit Class	840	30	25	--	--
½ Credit Class	420	15	25	--	--
Co-op Work Term	500	--	--	--	--
Science Ancillary Fees					
½ Credit Class (3 credit hours)	11	--	--	--	--
1 Credit Class (6 credit hours)	22	--	--	--	--
SCIE 1500.30R Class (30 credit hours)	50	--	--	--	--
King's (Arts & Social Sciences)					
Full-time ⁽¹⁾	3,655	--	--	10	(11)
Full-time term ⁽⁸⁾	1,830	--	--	--	(11)
Part-time ⁽⁹⁾					
3 Credit Classes	2,250	--	--	10	(11)
1 Credit Class	750	--	--	--	--
½ Credit Class (3 credit hours)	375	--	--	--	--
Auxiliary Fees					
Music (per specified class)	750	--	--	--	--
Theatre Arts (per specified class)	250	--	--	--	--
Ancillary Fee (Specified Science classes)					
½ Credit Class (3 credit hours)	11	--	--	--	--
1 Credit Class (6 credit hours)	22	--	--	--	--
SCIE 1500.30R Class (30 credit hours)	50	--	--	--	--
King's (Science)					
Full-time ⁽¹⁾	4,190	--	--	15	(11)
Full-time term ⁽⁸⁾	2,095	--	--	--	(11)
Part-time ⁽⁹⁾					
3 Credit Classes	2,520	--	--	15	(11)
1 Credit Class	840	--	--	--	--
½ Credit Class	420	--	--	--	--
Co-op Work Term	500	--	--	--	--
Science Ancillary Fees					
½ Credit Class (3 credit hours)	11	--	--	--	--
1 Credit Class (6 credit hours)	22	--	--	--	--
SCIE 1500.30R Class (30 credit hours)	50	--	--	--	--
Management					
BComm Co-op ⁽¹⁰⁾					
Full-time ⁽¹⁾					
Year of Study: 1,2&4	4,830	75	35	30	75
Year of Study: 3	2,415	75	35	30	75
Part-time ^{(9) ⁽¹⁰⁾}					
3 Credit Classes	2,886	75	35	30	75
1 Credit Class	962	30	25	--	--
½ Credit Class	481	15	25	--	--
Co-op transfer fee ⁽¹⁰⁾	610	--	--	--	--

Academic Fees 1997-98 (cont'd)

For information only, 1997-98 figures.

Faculty/Programme	Total Tuition Fee	Student Union Fee	Student Union Cap. Campaign & Facilities Fee	Society Fee	Athletic Fee
BComm and D.P.A.					
Full-time ⁽¹⁾	3,690	75	35	30	75
Full-time term ⁽⁸⁾	1,845	75	35	--	75
Part-time ⁽⁹⁾					
3 Credit Classes	2,250	75	35	30	75
1 Credit Class	750	30	25	--	--
½ Credit Class	375	15	25	--	--
Health Professions					
B.S.W.					
Full-time ⁽¹⁾	4,095	75	35	25	75
Full-time term ⁽⁸⁾	2,050	75	35	--	75
Part-time ⁽⁹⁾					
3 Credit Classes	2,430	75	35	25	75
1 Credit Class	810	30	25	--	--
½ Credit Class	405	15	25	--	--
Nursing ⁽⁵⁾					
Full-time ⁽¹⁾	4,550	75	35	20	75
Full-time term ⁽⁸⁾	2,275	75	35	20	75
Part-time ⁽⁹⁾					
3 Credit Classes	2,700	75	35	20	75
1 Credit Class	900	30	25	20	--
½ Credit class	450	15	25	20	--
Recreation, Health Education					
Full-time ⁽¹⁾	4,190	75	35	15	75
Full-time term ⁽⁸⁾	2,095	75	35	--	75
Part-time ⁽⁹⁾					
3 Credit Classes	2,520	75	35	15	75
1 Credit Class	840	30	25	--	--
½ Credit Class	420	15	25	--	--
Physical Education, Kinesiology					
Full-time ⁽¹⁾	4,550	75	35	15	75
Full-time term ⁽⁸⁾	2,275	75	35	--	75
Part-time ⁽⁹⁾					
3 Credit Classes	2,700	75	35	15	75
1 Credit Class	900	30	25	--	--
½ Credit Class	450	15	25	--	--
Pharmacy					
Full-time ⁽¹⁾⁽¹⁵⁾	5,360	75	35	65	75
Clinical Residence - Pharmacy	810	--	--	--	75
Physio and Occupational Therapy					
Full-time ⁽¹⁾	5,310	75	35	13	75
Diploma in Health Services Admin.					
Full-time ⁽¹⁾	4,230	75	35	--	75
Full-time term ⁽⁸⁾	2,115	75	35	--	75
Part-time ⁽⁹⁾					
3 Credit Classes	2,520	75	35	--	75
1 Credit Class	840	30	25	--	--
½ Credit Class	420	15	25	--	--
Law					
Full-time	5,100	75	35	46	75
Part-time ⁽⁶⁾ (See examples below)					
'R' Class (6 credit hours)	1,020	30	25	--	--
'R' Class (4 credit hours)	680	20	25	--	--
'A' or 'B' Classes (3 credit hours)	510	15	25	--	--
Legal Aid Clinic ⁽⁴⁾	2,142	75	35	46	75
Term after Legal Aid Clinic ⁽⁴⁾	2,958	75	35	46	75
Medicine					
M.D.	5,935	75	35	30	75
Postgraduate Interns & Residents	1,495	--	--	--	75
Dentistry ⁽⁷⁾					
D.S.S. ⁽²⁾	5,935	75	35	70	75
Dental Hygiene ⁽³⁾	4,585	75	35	35	75
Graduate Studies					
Arts & Social Science					
Doctorate					
Full-time	4,055	75	35	44	75
Masters					
Full-time	3,855	75	35	44	75
Part-time	1,285	60	25	22	--

Academic Fees 1997-98 (cont'd) Faculty/Programme	Total Tuition Fee	Student Union Fee	For Information Only, 1997-98 figures.		
			Student Union Cap. Campaign & Facilities Fee	Society Fee	Athletic Fee
Science (including Interdisciplinary Studies)					
Doctorate					
Full-time	4,590	75	35	44	75
Masters					
Full-time	4,390	75	35	44	75
Part-time	1,465	60	25	22	--
Masters of Oral and Maxillofacial Surgery					
Full-time	6,135	75	35	44	75
Education					
Doctorate					
Full-time	3,870	75	35	44	75
Masters					
Full-time	3,670	75	35	44	75
Part-time	1,225	60	25	22	--
Marine Management					
Masters					
Full-time	3,890	75	35	44	75
Part-time	1,300	60	25	22	--
Public Administration, Library and Information Studies, Environmental Studies					
Masters ⁽¹⁴⁾					
Full-time	4,390	75	35	44	75
Part-time	1,465	60	25	22	--
Masters of Business Administration (2 year programme) ⁽¹⁹⁾					
Full-time	4,490	75	35	55	75
Part-time	1,500	60	25	28	--
Masters of Business Administration (10 or 8 month programme) ⁽¹⁹⁾					
Full-time	7,000	75	35	55	75
Graduate Diploma in Public Administration					
Full-time	3,890	75	35	44	75
Part-time	1,300	60	25	22	--
Nursing, Kinesiology and Physical Education					
Masters					
Full-time	4,750	75	35	44	75
Part-time	1,585	60	25	22	--
Leisure Studies, Recreation and Health Education					
Masters					
Full-time	4,390	75	35	44	75
Part-time	1,465	60	25	22	--
Social Work					
Masters					
Full-time	4,295	75	35	25	75
Part-time	1,435	60	25	13	--
Health Service Administration					
Masters					
Full-time	4,430	75	35	44	75
Part-time	1,480	60	25	22	--
Human Communications Disorders and Physiotherapy					
Masters					
Full-time	5,510	75	35	44	75
Part-time	1,840	60	25	22	--
Pharmacy					
Doctorate					
Full-time	5,710	75	35	44	75
Masters					
Full-time	5,510	75	35	44	75
Part-time	1,840	60	25	22	--
Law					
Doctorate	5,500	75	35	44	75
Masters	5,300	75	35	44	75
Thesis Only - All Programmes except Education					
Full-time	1,210	75	35	44	75
Part-time	1,210	66	25	22	--
Full-time Term	605	75	35	44	75
Part-time Term	605	66	25	22	00
Thesis Only - Education					
Full-time	890	75	35	44	75
Part-time	890	66	25	22	--
Full-time Term	445	75	35	44	75
Part-time Term	445	66	25	22	--

Academic Fees 1997-98 (cont'd) Faculty/Programme	Total Tuition Fee	Student Union Fee	For Information Only, 1997-98 figures.		
			Student Union Cap. Campaign & Facilities Fee	Society Fee	Athletic Fee
Graduate Qualifying, Special & Visiting Students					
Full-time ⁽¹⁾	3,855	75	35	44	75
Full-time term ⁽⁸⁾	1,930	75	35	—	—
Part-time ⁽⁹⁾					
3 Credit Classes	2,340	75	35	44	75
1 Credit Class	780	30	25	—	—
½ Credit Class	390	15	25	—	—

Notes:

- (1) Undergraduate students taking three and one-half credit classes (21 credit hours or more) in regular session (Sept. - April).
- (2) D.D.S. Requires an instrument fee and \$500 user fee payable with the first instalment of fees.
- (3) Dental Hygiene requires \$250 user fee payable with the first instalment of fees.
- (4) Students will pay full-time student union, society, and athletic fees only once per academic year.
- (5) Nursing students will pay society fee only once per academic year.
- (6) Law students taking less than 18 credit hours (Sept. - April), tuition fees - \$170 per credit hour plus Student Union fees (\$5 per credit hour and \$25 Capital Campaign & Facilities fee).
- (7) Candidates with advanced standing admitted to special programmes in D.D.S. and Dental Hygiene that meet Provincial Professional Qualifications are required to pay twice the tuition fee paid by students in the regular programme.
- (8) One term only taking more than 3 one-half credit classes (more than 9 credit hours).
- (9) Undergraduate students taking less than three and one-half classes (less than 21 credit hours) in regular session (Sept. - April) or taking three one-half credit classes or less (9 credit hours or less) in one term only.
- (10) Tuition amount includes co-op fees - Year 1, 2 & 4 \$610, year 3 \$305, part-time \$61 per one-half credit class. Students transferring into Co-op programme from another faculty or institution will pay a transfer fee of \$610. The transfer fee is non-refundable.
- (11) King's students may purchase Dalplex membership at an additional cost of \$112.
- (12) \$2415 (tuition \$2110 and \$305 co-op fee) payable when registering for spring co-op Session 1998.
- (13) \$2415 (tuition \$2110 and \$305 co-op fee) payable when registering for Winter academic term on or before January 19, 1998.
- (14) Tuition includes Management auxiliary fee - \$500 full-time and \$165 for part-time students.
- (15) Tuition includes \$50 printing recovery fee.
- (16) Auxiliary fee for specified classes in Music and Theatre Arts (see Timetable for specific classes) is payable with the first instalment.
- (17) King's fee are subject to approval of University of Kings College Board of Governors.
- (18) Students will pay Student Union Capital Campaign and Facilities Fee once per academic year.
- (19) Tuition amount includes MBA auxiliary fee - \$600 full-time and \$200 for part-time students.

M. Income Tax Credit from Academic Fees

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

A special income tax certificate (T2202A) will be available at Student Accounts annually no later than February 28. A photocopy of the T2202A will be provided on request for a charge of \$5.00 per receipt. On request, a replacement tax receipt will be provided within 2 weeks for a charge of \$10.00 per receipt.

N. 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 \$15.00 is charged. Regular academic year ID cards remain valid until the beginning of the following academic year (including summer session).

O. Laboratory Deposits

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

P. Athletic Fee

Membership at Dalplex for 1998-99 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.

Table II: Miscellaneous Fees

FEE	AMOUNT	PAYABLE AT
Replacement Tax Receipt	\$10	Student Accounts
Photocopy Tax Receipt	\$5	Student Accounts
Late Registration	\$50	Student Accounts
Reinstatement Fee	\$50	Student Accounts
Returned Cheque	\$20	Student Accounts
Distance Education Fee, per class	\$100	Student Accounts
Admission Deposit	\$200	Student Accounts
Change from Audit to Credit	\$25	Student Accounts
Confirmation of Fee Payment	\$5	Student Accounts
Leave of Absence Fee	\$25	Graduate Studies
Application Fee	\$35	Registrar
Confirmation of Enrolment	\$5	Registrar/Grad. Studies
Late Graduation Application	\$50	Registrar
Letter of Permission per class - maximum of \$50.00	\$10	Registrar
Reassessment Fee	\$25	Registrar
Replacement ID	\$15	Registrar
Transcript	\$5	Registrar
Priority Transcript Fee	\$15	Registrar
Same Day Transcript Fee	\$25	Registrar
FAX Fees:		
Metro	\$5	Registrar
Canadian	\$10	Registrar
International	\$15	Registrar
Residence Application Fee	\$25	Residence

* Except for the following programmes which require payment of a \$55.00 application fee: Occupational Therapy, Pharmacy, Physiotherapy, Recreation, Social Work; Diploma programmes in Meteorology, Outpost and Community Health Nursing, and Health Services Administration; and all programmes in the Faculties of Medicine, Dentistry (including Dental Hygiene), Law, and Graduate Studies.

Table III: Fee Refund Calculation - Specified Limited Enrolment Programmes

Admission Deposit: Non-refundable
 Student Union Fee: Non-refundable after September 25 (Second Term January 18)
 Athletic Fee: Non-refundable after September 25 (Second Term January 18)
 Society Fee: Non-refundable after September 25 (Second Term January 18)
 Tuition Fees: As follows:

Withdrawal Date	Regular Session	First Term Only	Second Term Only
Up to September 9	100%	100%	100%
Sept. 10 - Jan. 4	40%	0%	100%
After Jan. 4	0%	0%	0%

Table IV: Fee Refund Calculation

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 and their impact on fees.

Students changing to part-time³ from full time¹ after September 25 in all faculties except Architecture, Computer Science, Engineering and limited enrolment programmes will be assessed the same percentage of full-time tuition fees as students withdrawing from the university. Please refer to the refund schedule below to determine the percentage owing. 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 time³ and students in the faculties of Architecture, Computer Science and Engineering dropping a class will be assessed the same percentage as part-time students withdrawing from the university. Please refer to the refund schedule below to determine the cost of classes being dropped. Additions are assessed according to the fee schedule.

Withdrawals

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

Student Union Fees: Non-refundable after September 25 (Second Term January 18)
 Athletic Fee: Non-refundable after September 25 (Second Term January 18)
 Society Fee: Non-refundable after September 25 (Second Term January 18)
 Ancillary Fee: Non-refundable after September 25 (Second Term January 18)
 Co-op Fees: Non-refundable after September 25 (Second Term January 18)
 Distance Education Fee: Non-refundable after September 25 (Second Term January 18)
 Differential Fee: Non-refundable after November 30 (or with special permission until April 9, 1999)
 Tuition Fees and Auxiliary Fees: As below:

Date	Regular Session Full-time ¹	Graduate Students Except Thesis Term	Full-Time & Thesis 1st Term Only ²	Full-Time & Thesis 2nd Term Only ²	Architecture, Computer Science, Engineering Part-Time Students ³		
					A Class	B Class	R Class
Up to Sept. 25	100%	100%	100%	100%	100%	100%	
Sept. 26 - Oct. 9	85%	85%	67%	100%	100%	85%	
Oct. 10 - Nov. 9	70%	70%	0%	100%	100%	70%	
Nov. 10 - Dec. 31	50%	50%	0%	100%	100%	50%	
Jan. 1 - Jan. 18	40%	40%	0%	100%	100%	40%	
Jan. 19 - Feb. 1	40%	40%	0%	67%	0%	40%	
After Feb. 1	0%	0%	0%	0%	0%	0%	

1. Applicable to undergraduate students registered in regular session (Sept. - Apr) taking more than three credits (21 credit hours or more).
2. Undergraduate students registered in one term only taking more than three one-half credit classes (more than 9 credit hours). Graduate students registered as "Thesis Only" for one term.

Q. 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 SUB Telephone No. 494-2146

DalTech students please contact the Student Union Office located in the J Building at 1360 Barrington Street.

1997-98 Student Union Fees (Excluding DalTech)

Full-Time (3 credits or more) - For information only

General Operation.....	\$51.75
Class Evaluation	1.00
C K D U - FM	9.00
NSPIRG	4.00
South African Trust Fund	1.00
WUSC	0.50
Women's Centre Fund	2.00
Student Accessibility Fund	1.75
Gazette	4.00
TOTAL.....	\$75.00

III. DalTech Fees (1997-98)

The 1998-99 academic fee schedule is not available. The following information provides the 1997-98 fees. Once fees are approved for 1998-99, the official schedule showing total academic fees due will be included in the registration package.

A. Class Fee

Class fees are charged on a per class basis:

Undergraduate Programme

- \$411 per class
- \$100 per audit

Graduate Programme

- \$623 per class
- \$100 per audit

B. Incidental Fees

Graduate students are classified as full or part-time on a programme basis rather than per class. All other references to full-time students in this section refer to students taking 3 or more classes per session. For non-graduate students, references to part-time students in this section refer to students taking less than 3 classes per session.

1. Student Union Fees

Undergraduate

- \$26 per session for full-time students
- \$13 per session for part-time students

Graduate

- \$17.50 per session for full-time students
- \$8.75 per session for part-time students

Student Union Extended Health Care Plan

- \$95 single (per academic year)

The Student Union Health Care Plan is compulsory for all full-time students. Information pertaining to the Student Union Extended Health Care Plan is given in the section, "University Regulations". In September, students utilizing the Student Union Extended Health Care Plan will be required to pay 100% of the medical fees.

2. Building Fund Fees

Undergraduate

- \$7.50 per session for full-time students
- \$2.25 per session for part-time students

Graduate

- \$5.00 per session for full-time students
- \$5.00 per session for part-time students

3. Student Society Fees

Architecture Undergraduate

- \$12.50 per session for full-time students
- \$6.25 per session for part-time students

Computer Science Undergraduate

- \$12 per session for full-time students
- \$6 per session for part-time students

Engineering Undergraduate

- \$12.50 per session for full-time students
- \$6.25 per session for part-time students

Graduate

- \$6 per session for full-time students
- \$3 per session for part-time students

4. Athletic Fee

- \$35 per academic year for full-time students

C. Architecture Ancillary Fee

A special fee assessment initiated by the students in the Faculty of Architecture in the amount of \$70 per academic session for fifteen (15) sessions commences the Summer Session of 1995 and ends in the Winter Session of 2000. The assessment will be used to support the purchase of a new computer system for the Faculty of Architecture.

D. Career and Co-operative Education Fees

1. Work Term Registration Fee

A registration fee of \$50 is assessed for each session of a Co-op Work Term at the time of registration for the work term.

Table V: Typical Schedules of Graduate Registration

Minimum time in a Master's Programme with 6 Classes and Major Thesis (requires 1 unit)

Year	Fall	Winter	Summer
1	3 classes	3 classes	SC Cont. 3 Session Continuance
2	Major Thesis		

Minimum time in a PhD Programme with 6 Classes and Thesis (requires 2 units)

Year	Fall	Winter	Summer
1	3 classes	3 classes	SC Cont. 3 Session Continuance
2	PhD Thesis		
3	PhD Thesis		

Extended time in a Master's Programme with 8 classes and a Minor Thesis/Project (requires 1 unit)

Year	Fall	Winter	Summer
1	3 classes	3 classes	SC Cont. 3 Session Continuance
2	1 class	TP 6000.0 Thesis/Project	
3	Thesis/Project Continuance	1 class	Thesis/Project Continuance

Extended time in a PhD Programme with 6 Classes and a Thesis (requires 2 units)

Year	Fall	Winter	Summer
1	3 classes	2 classes	SC Cont. 3 Session Continuance
2	PhD thesis		
3	1 class	TP 7000.0 PhD Thesis	
4	Thesis/Project Continuance	Thesis/Project Continuance	Thesis/Project Continuance
5	Thesis/Project Continuance	Thesis/Project Continuance	Thesis/Project Continuance

2. Placement Fees: Faculties of Engineering and Computer Science

- a) A Placement Fee of \$200 is assessed for each student who obtains a co-op internship or summer job which is advertised by either the Career Services Office, a faculty member or any Department of the University.
- b) The Placement fee is assessed if the student accepts a position which was advertised or developed by the University for an upcoming work term, even if the student did not make application through the DalTech competitive process.
- c) The Placement fee is not assessed if the student returns to a previous employer provided that the employer has not had to re-advertise the position to other students.
- d) Students who work for continuous periods in excess of four months with the same employer will only be assessed once.
- e) The Placement fee is assessed on the date of formal acceptance of a job.
- f) Invoices for Placement Fees are issued by the Co-op Office and must be paid within 30 days to Student Accounts.
- g) The fee is due and payable even if the student subsequently withdraws, or is required to withdraw, from the placement.
- h) Fees not paid by the due date are considered delinquent.
- i) A student may appeal the \$200 Placement Fee assessment if he or she feels that the job was not advertised or developed by the University, by submitting a completed "Appeal of Placement Fee" form (available at the Co-op Office).

3. **Assessment and Evaluation Fee: Faculty of Architecture**
A Work Term Assessment and Evaluation Fee of \$100 is assessed for each Co-op Work Term.

E. Thesis and Continuing Fees - Graduate Studies

Graduate students whose programme includes a thesis or project option must register and pay the fees prescribed at the beginning of the academic year in which they plan to commence work on the thesis or project. Each thesis project unit will cover a 12-month period (September to August). PhD students must register and pay fees as noted below for two thesis units.

Late registration for the thesis project may be accepted by the Registrar until the end of March, but the period covered by the tuition fee will extend only to the end of August in each case. Both full and part-time students who wish to maintain their eligibility to complete their degree requirements subsequent to finishing the one or two units of thesis/project work must register for Thesis/Project Continuance. Please check with your academic advisor regarding time regulations for continuation of a programme.

SC Cont. 1, 2, 3, Session Continuance

- \$50 per session

Thesis/Project

The full fee is due during the session of registration.

- \$623 per academic year for Master's Minor Thesis/Project (requires 1 unit)
- \$1246 per academic year for Master's Major thesis (requires 1 unit)
- \$1246 per academic year for PhD Thesis (requires 2 units)
- \$300 per session for Thesis/Project Continuance

Continuous registration in all graduate programmes is mandatory; therefore, both full-time and part-time graduate students are required to register in the Fall, Winter and Summer session; however, leave of absence may be granted in exceptional circumstances. Prior approval must be sought in writing from the Dean of Graduate Studies.

Session Continuance (SC Cont. 1, 2, 3) is to be used for maintaining graduate registration during a session prior to thesis/project registration when no suitable classes are available. Once thesis/project work has begun, students must maintain their registration by registering for Thesis/Project Continuance.

Classes taken as "programme requisite" classes in addition to the normal 6 or 8 class requirement are free of charge (up to 3), provided they are noted on the student's Programme Approval Form as requested by the student's supervisor or supervisory

committees. Otherwise they will be charged at the normal rate. Free classes cannot be transferred to another DalTech degree programme unless the usual tuition per class fee is paid.

Prerequisite classes beyond four are free of charge provided they are noted on your Programme Approval Form as requested by the student's supervisor or supervisory committee. Otherwise they are charged at the normal rate.

Students classified as "qualifying" are not permitted to register for the Thesis/Project during a qualifying period. Nor are they eligible for the "beyond four are free" clause for prerequisite classes.

If a student fails to make the minimum acceptable mark required in a class, it will not count as financial credit toward the 6 or 8 requisite requirement.

Students who take any free classes during a session when they would normally be registered for Thesis/Project continuance must still register for TC9000.1, 2, 3 and pay the Thesis/Project continuance fee.

Notwithstanding the above, any class taken on a Letter of Permission at another institution is not eligible to be taken as a free class. It is, however, eligible to be counted as a requisite or prerequisite class.

Students should refer to the Definitions section of the university Regulations to clarify the meaning of Programme Requisite Class and Prerequisite Class.

Negotiation for free classes is done on a case by case basis and contact must be made with the Registrar's Office in order to facilitate a review of a student's eligibility.

IV. 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 Facilities Co-ordinator. Complete information on withdrawal from residence is available from the Residence Co-ordinator or Fenwick Facilities Co-ordinator and is detailed in the residence 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. Residence Application Forms will not be distributed until the student has been accepted by the University for the coming session. To be considered for accommodation, a completed Residence Application Form and the \$125.00 residence application fee and deposit must be received. All residents, new and returning, who have accepted a room assignment, will be required to pay a second deposit of \$200.00 by June 30 to reconfirm the assigned space. Failure to make a second deposit by June 30 will result in automatic cancellation of room assignment. Once the \$200.00 deposit is paid it (along with the \$125.00) 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.

A. 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 29. At the time of printing the monthly rate of interest is 0.65% monthly (7.80% 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 and the Residence Houses fees are paid at the Student Accounts Office. For Fenwick Place and Glengary Apartments and Co-ed Apartment Units fees are paid at Fenwick Place.

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

Science. Special arrangements are to be made with the Residence Co-ordinator or Fenwick Facilities Coordinator for accommodation for periods prior to or following the session as defined above.

C. Residence Rates 1998-99

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

The residence term for Fenwick Place is as follows: First semester - September 6 to December 31; second semester - January 1, 1999 to April 30, 1999. 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 deposit of \$125.00 and second deposit of \$200.00 has been paid (see Table

Table VI: Residence Rates - 1997-98 - Payment Alternatives

RESIDENCE TYPE	Deposits		Alternative 1		Alternative 2		Total Fees
	1st Deposit	2nd Deposit	Balance If Paid	Total Fees	Pay 1st Part	Pay Balance	
Traditional ⁽¹⁾							
Howe Hall							
Shirreff Hall							
Eliza Ritchie Hall							
Single Room	125	200	4,905	5,230	2,280	2,635	5,240
Double Room	125	200	4,540	4,865	2,110	2,440	4,875
Residence House							
Single Room	125	200	2,675	3,000	1,245	1,440	3,010
Double room	125	200	2,290	2,615	1,065	1,235	2,625
Apartments							
Glengary							
Bachelor Apts.	125	200	3,820	4,145	1,770	2,050	4,145
3-person (3 bedroom)	125	200	3,095	3,420	1,435	1,660	3,420
Fenwick Place ⁽²⁾							
2-person (2 bedroom)	125	200	3,530	3,855	1,765	1,765	3,855
3-person (3 bedroom)	125	200	3,195	3,520	1,598	1,598	3,520
4-person (4 bedroom)	125	200	2,820	3,145	1,410	1,410	3,145

Meals Only - Special Rate for session

Meal only plans may be purchased from Dalhousie Food Service Office, Killam Library.

19 meal Plan per Week	\$2,070
14 meal Plan per Week	\$2,000

PLEASE NOTE: The above fees will be superseded on July 1, 1998 when the 1998/99 residence fee schedule will be published.

(1) The residence rates include a residence council fee (Howe Hall \$50; Shirreff Hall and Eliza Ritchie Hall \$30). In addition the residence fees include the cost of a 19 meal plan per week. If the 14 meal plan option is chosen, the fees will be reduced by \$70.

(2) At Fenwick Place, Total Fees include a refundable \$100 damage deposit. See application form for details.

B. 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

V):

1. Pay the Total Fees by September 30th.
2. Pay the Total Fees in two equal parts, first half by September 30th and the second half by January 29th. A \$10.00 service charge will be added to the second instalment (Fenwick and Glengary are exempt from this charge).

V. DalTech Residence Fees

Additional Fees

A Residence Fee of \$5.00 per session will be collected at the time fees are paid to support student-run programmes in residence. Residence fees include cable television. Ethernet is available at an additional charge.

Application and Withdrawal

Application for Fall and/or Winter accommodation can be made as one application for both sessions or can be made by the session. Applications are accepted all year round, but since offers of accommodation are made on first-come, first-served basis, students can best assure themselves of a space in residence by applying as

early as possible for the appropriate session. Applications arriving after July 1st for September, December 1st for January, or April 1st for Summer Session are welcome but may coe after all space has been offered. All applications must be accompanied by a cheque or money order in the amount of \$125 (Canadian), made payable to Dalhousie University.

Dalhousie residence Application Deposit Policies and Procedures

1. A deposit in the amount of \$125 is required with each residence application.
2. Twenty-five dollars of this deposit is a non-refundable application fee. One hundred dollars is refundable if:
 - a) a student declines in writing by June 30th a residence space offered or;
 - b) a student requests in writing while on a waiting list and prior to being offered a space in residence or;
 - c) if a student has been placed on a waiting list but not offered a space. (As of September 30th, students will be offered the opportunity to remain on the waiting list or receive a refund. As of March 15 those students remaining on the waiting list will automatically receive a refund.)
3. Students who are assigned rooms after June 30th but declined that assignment will not qualify for a refund. The entire payment is forfeited.

4. All students who have accepted a room assignment are required to pay a second room deposit of \$200 prior to June 30th. Failure to make the second deposit will result in cancellation of the room assignment. Once paid, this deposit is non-refundable.
5. Students who accept a room assignment after June 30th, have two weeks to submit their \$200 room deposit.

Students are reminded that upon arrival at residence that they will be required to sign a Residence Agreement committing them to living in residence for the appropriate designated time frame. At that time a caution deposit of \$75 is also payable. This deposit is refundable at termination of occupancy if no damage or loss of furniture has occurred. A student wishing to terminate his/her occupancy prior to the date indicated on the agreement will be required to find a replacement that is acceptable to the Director before any fees are refunded. Fees will be refunded on a prorated basis, after the new resident has paid the remaining fees.

Residence Fee Payment

Residence fees are due in full on the first day of classes of the Fall, Winter and Summer Sessions respectively. Fees not paid by the due date are considered to be delinquent and are subject to interest charges as prescribed under the section "Delinquent Accounts".

Residence Rates 1997-98

O'Brien Hall

	Summer Session A 1997	Summer Session B 1997	Fall 1997	Winter 1998
Single room without meals	875	980	N/A	N/A
Super single room without meals	1,065	1,190	N/A	N/A
Double room without meals	680	790	N/A	N/A
Single room with 19 meals/week	N/A	N/A	2,580	2,455
Super single room with 19 meals/week	N/A	N/A	2,675	2,550
Double room with 19 meals/week	N/A	N/A	2,350	2,230
Single room with 14 meals/week	N/A	N/A	2,475	2,375
Super single room with 14 meals/week	N/A	N/A	2,570	2,465
Double room with 14 meals/week	N/A	N/A	2,245	2,150
Single room with 10 meals/week	N/A	N/A	2,320	2,195
Super single room with 10 meals/week	N/A	N/A	2,415	2,290
Double room with 10 meals/week	N/A	N/A	2,090	1,970

Summer Session A - April 25 - July 25, 1997

Summer Session B - April 25 - August 5, 1997

Grad House

	Summer Session A 1997	Summer Session B 1997	Fall 1997	Winter 1998
Super single room without meals	1,065	1,190	1,590	1,460
Super single room with 19 meals/week	N/A	N/A	2,675	2,550
Super single room with 14 meals/week	N/A	N/A	2,570	2,465
Super single room with 10 meals/week	N/A	N/A	2,415	2,290

Awards

Scholarships, Awards, Financial Aid and Bursaries

The Awards Office, within the 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 Registrar's Office (Awards). The Statement of Terms contains some of the more pertinent policy items for easy reference. Additional scholarship regulations are listed below.

I. General Policy

A. Full Class Load

- 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. A full class load for most 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.
- 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).
- 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.

B. 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.) In so far as scholarships, bursaries and governmental student loans are concerned, Dalhousie and King's are separate. In order to receive Dalhousie money one must be registered at Dalhousie University.

C. 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:

1. College of Arts & Science

Bachelor of Arts; Bachelor of Music; Bachelor of Science; Diploma in Engineering

2. Faculty of Architecture

Bachelor of Environmental Design Studies (in-course scholarships only)

3. Faculty of Computer Science

Bachelor of Computer Science

4. Faculty of Dentistry

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

5. Faculty of Engineering

Bachelor of Engineering

6. 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 Health and Human Performance - Bachelor of Physical Education; Bachelor of Recreation (for in-course scholarships only); Bachelor of Science (Health Education); Bachelor of Science (Kinesiology)
- Maritime School of Social Work - Bachelor of Social Work (in-course scholarships only)

7. Faculty of Management

- School of Business Administration - Bachelor of Commerce, Bachelor of Management

D. When Scholarships Are Tenable

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

E. Scholarship Payments and Rebates

- Payments: Dalhousie University scholarships are credited towards students' accounts first for tuition and prescribed fees, and secondly for residence fees if and only if you stay enrolled at the University.
- 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 October, and the refunds are made by the Student Accounts Office.

F. Scholarship Duration

Dalhousie offers both renewable and non-renewable Entrance Scholarships. Renewable entrance awards are renewable for the duration of the programme in which the awardee was enrolled at the time of the award (maximum of four years). Holders of renewable scholarships are notified of either the renewal or the non-renewal of their scholarships. Please note that holders of renewable scholarships are NOT entitled also to hold one-year scholarships from the University Scholarship portfolio grouping.

G. Eligible Classes

The Registrar's Office (Awards) 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). Summer Session classes are also considered. These classes will be assessed at the end of the summer if they should constitute part of the normal five credits or equivalent not yet considered for in-course scholarships.

Correspondence classes are considered for scholarship purposes.

Please note that classes taken at other institutions are eligible for scholarship assessment if such classes are taken on the basis of Letter of Permission towards an eligible degree/diploma here.

H. 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. An artificial academic year consists of the number of credit hours as prescribed by the year of study in a given programme and is constructed artificially (because full-time and part-time students are eligible) by gathering classes (1) by session chronologically, (2) by highest grade within session, and (3) by highest credit hour value among classes with the same grade, until the prescribed credit hour load is accumulated. Any classes remaining are first counted in the next assessment for scholarship. In this manner all eligible classes are counted once for scholarship purposes.

I. Scholarship GPA

(a) In general

Each year of study within each eligible programme 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 Sessional GPA normally differ.

The Scholarship GPA, expressed to two decimal places, does not show on a student's transcript.

(b) Concerning Renewable Scholarships

For renewable entrance scholarships which are awarded in 1998/99 and afterwards, the renewability point is an SGPA of 3.85.

For renewable entrance scholarships which were awarded in 1997/98 and previously, the renewability point remains an SGPA of 3.70.

J. Qualifying for One-Year Scholarships

In order to give students some idea of the threshold level to qualify for in-course scholarships, one should strive to achieve an SGPA of at least 3.80 for most programmes and 3.85 for pharmacy and science. These figures are illustrative only. The actual threshold averages vary from programme to programme within a given session as they do from one session to another. They cannot be predetermined.

K. Academic Year and Assessment Timing

The academic year consists of five sessions: Spring, Summer, Fall, Regular (Fall and Winter) and Winter.

For full-time students the University will normally assess records in mid-June (most programmes; the remainder will be done in September). 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, and part-time students the University will normally assess records in mid-September for those students who at the end of August achieved the minimum threshold level for in-course scholarship consideration.

L. Degree Programme Considered for Assessment

Changing degree/diploma programmes can have implications for scholarship consideration. Scholarship holders considering degree changes should consult the Registrar's Office - Awards about the implications of such a change.

M. Reduced Class Load and Retention of Scholarship

Continuing students to whom an undergraduate scholarship has been offered may retain the scholarship while undertaking a reduced class load. Scholarship holders considering taking a reduced class load should consult the Registrar's Office - Awards about the implications of making such a change. Holders of renewable scholarships must complete the prescribed standard class load within September to August, and preferably between September to April. Holders of renewable entrance scholarships are reminded that as one progresses through a degree programme the range of choice for summer sessions classes diminishes.

N. 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).

O. Graduation and Scholarships

If you hold a renewable scholarship and if you choose to graduate earlier than originally expected, and then you decide to return to upgrade your degree to an Honours or Advanced Major, please note that you would forfeit eligibility for continuation of said scholarship. In other words, graduation constitutes completion of programme.

P. Transfer Students

Please note that transfer students are ineligible for scholarships in the year of transfer. After one year, such students would be considered on the same basis as other students.

Q. Taxation and Scholarships

Under the Income Tax Act the University is required to report scholarships. On occasion the government may audit your awards. You should therefore retain copies of award letters so that you can readily forward copies for audit or confirmational purposes.

The University is required by law to prepare a T4A form for the recipient of a University scholarship (applies also to bursary or prize or other monetary awards). The generation of such documents for University scholars shall be for the tax year in which the scholarship was authorized. This is a condition of accepting the scholarship.

R. Student Aid and Scholarships

Provincial Student Aid authorities require that students report their scholarships. On occasion the government may audit your awards. You should therefore retain copies of award letters so that you can readily forward copies for audit or confirmational purposes.

S. Withdrawing

If it should become necessary to discontinue studies, it is most important that students do so in writing via the Office of the Registrar. Depending upon the time of withdrawal, students may be entitled to a prorated portion of the generic scholarship to be credited towards academic fees, if the student is enrolled in an academic programme other than one having a 'limited enrollment'. If one is enrolled in a programme having 'limited enrollment' (i.e., Bachelor of Nursing, Bachelor of Science (Health Education) or Bachelor of Science (Kinesiology)), no portion of the entrance scholarship may be claimed.

Please note that no portion of said scholarship may be applied against residence fees if one is withdrawing from the University.

T. 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.

II. Entrance Scholarships

Dalhousie University offers scholarships in one of two award groups, to outstanding students who are admitted directly from high school to the first year of study. The regular group consists of six entrance scholarship programmes, one for each of arts, commerce, health professions, science, engineering and computer science. In each of these, the scholarships (1997/98 value) range from \$2,000 (for one year only) to \$4,000 (renewable) and \$6,000 (renewable). The renewable scholarships are tenable for the duration of the programme or to a maximum of four years, provided that the holder achieves the competitive level of academic excellence, i.e., a Scholarship Grade Point Average of 3.85. In order to be considered for the \$6,000 Chancellor's Scholarships candidates will have achieved a very high Aggregate Score.

The supplementary group consists of \$500 and \$1,000, each awarded for one year's duration. The higher value will be offered to

candidates who have an Admissions Average of 90.0 per cent, but who do not qualify for a scholarship in the regular group and do not have amongst their subjects a grade of less than 70.0 per cent. Candidates for \$500 will have achieved an Admissions Average of not less than 80.0 per cent to a maximum of 89.9 per cent, with no grade below 70.0 per cent in their complement of classes.

Please note that candidates will be considered in either the regular or the supplementary entrance scholarship groups. In order to receive funds, awardees must be registered at Dalhousie University proper (the University of King's College has its own entrance scholarship programme).

Non-renewable scholarships for subsequent years are also available and they are described under "In-Course Scholarships." 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).

Please note that applicants will be considered for an entrance scholarship in one of six academic programme groups, namely that programme on record by the deadline date. Although applicants may change their minds, entrance scholarship consideration occurs only once. The programme groups are arts, science, health professions, engineering and computer science, and commerce, each consisting of one or more eligible degrees or diplomas. Applicants will be considered automatically for either a renewable scholarship or a renewable, but not both. The number of scholarships allotted to each programme group is proportional to the respective populations at Dalhousie. As a direct consequence cut-off averages will vary among the different programme groups.

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 by April 1st.

A. Criteria Summary

The following is a summary of the essential criteria which the University uses for its assessment of records of entering students who wish to be considered for an entrance scholarship:

1. The Application for Admission must be received by the Office of the Registrar by April 1st.
2. In its assessment of entrance scholarship candidates the University considers (i) admissions average (based on admission requirements); (ii) the degree of difficulty (AP, IB, Enriched, Honours) of courses; (iii) total number of university preparatory courses beyond the minimum five; and (iv) the applicant's position in the graduating class (top 1%-2% or top 3%-5%). The assignment of regular entrance scholarships is based on the Aggregate Score.
3. The applicants are assessed on a mutually competitive basis for the available funds allocated to the regular entrance scholarship programme.
4. Admitted students will be considered for an entrance scholarship in only one of these academic groups: Arts (includes music), health professions (health education, kinesiology and nursing), commerce, science (includes DISP), engineering, and computer science.
5. Transfer Students are precluded from entrance scholarship consideration. Please note that entrants coming from Year II of a CEGEP are considered to be Transfer Students.

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.

B. Quick View Scholarships (1998/99 values, subject to change)

\$6000

- renewable to a maximum of four years (minimum average is SGPA of 3.85 for renewal)
- awarded on the basis of a very high Aggregate Score
- these awards are not tied to faculty grouping

\$4000

- renewable to a maximum of four years (minimum average of SGPA of 3.85 for renewal)
- awarded on the basis of a very high Aggregate Score
- these awards are distributed on a population basis among faculty groupings (because the populations of the groups differ, the same Aggregate Score can yield different scholarship values in each group)

\$3000

- tenable for one year
- awarded on the basis of high Aggregate Score
- these are distributed on a population basis among faculty groupings (see preceding entry)

\$1000

- tenable for one year
- awarded on the basis of an Admissions Average of 90.0 per cent or greater but not qualifying for a regular entrance scholarship
- have no grade less than 70.0 per cent among subjects taken
- these awards are not tied to population

\$500

- tenable for one year
- awarded on the basis of an Admissions Average of 80.0 per cent to 89.9 per cent
- have no grade less than 70.0 among the subjects taken
- these awards are not tied to population

C. Some Helpful Terms

1. Admissions Average

This is the average of the subjects which were used for entry to the Dalhousie academic programme and are governed by Admission requirements for the degree/diploma selected.

2. Aggregate Score

This number is the sum of the Admissions Average plus points which are assigned to the degree of difficulty, the number of university preparatory subjects beyond the minimum five and the position in the graduating class, expressed either as the top 1-2 per cent or the top 3-5 per cent.

3. Faculty Groupings

There are six: arts and music; commerce; health professions (nursing, kinesiology and health education); science; engineering; and computer science. The eligible degree/diploma programmes are listed elsewhere in the Awards section of this Calendar.

D. Entrance Scholarship Funds

The following endowments (without an asterisk) make possible the funding of the aforementioned Dalhousie generic entrance scholarships. Entries marked with an asterisk are selected by bodies other than the Registrar's Office - Awards (ROA). Unless otherwise noted, these scholarships are administered by the Office of the Registrar.

On occasion a given student may be eligible for more than one non-ROA entrance scholarship. It is University practice to distribute scholarships among as many students as possible.

1. Entrance Scholarships Which Require Separate Application or Nomination

*Dalhousie Alumni Association Scholarships

With a gift of \$20,000 in September 1968 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. Contact the Registrar's Office for information. The fund is administered by the Alumni Office.

Dalhousie Alumni Leadership Scholarships

A small number of these scholarships, ranging in value from \$1,000 to \$2,000, are open to entering students who have achieved a good scholastic record at high school. An admissions average of at least 80.0 per cent (with no subject grade below 70.0 per cent) is required. Candidates must have played a leadership role in extracurricular activities such as community service, student government, athletics, or the visual or performing arts. Contact the Registrar's Office.

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 Lockward Memorial Scholarships

These scholarships have been established from an endowment by the late Reginald and Anne T. Lockward of Liverpool, N.S. A number of scholarships, each valued at \$4,500, will be awarded annually; they are tenable for one year. Candidates for Lockward 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 particularly 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 April 1st. Nomination forms and letters of reference, identified for Lockward consideration, are to be sent to: Office of the Registrar.

2. Entrance Scholarships Which are Separately Administered (Internal Selection)

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 3.70. Please note that the value of the scholarship is that for tuition proper.

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.

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 QEHS was constructed.

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.

North Nova Scotia Highlanders Memorial Award

An award of up to \$300 is available to an entering student who clearly shows leadership qualities and has a strong background in competitive athletics and other extra curricular activities. Applicants must have achieved at least an 80 percent average in Grade XII. Candidates must apply with supporting documentation to Manager of Student Athletics, Dalplex, Dalhousie University, Halifax, NS, B3H 3J5.

Nova Scotia Power Inc. Scholarship

Beginning in 1995, Nova Scotia Power Inc. will sponsor an annual scholarship in the amount of \$1,500 for full-time study in an undergraduate degree programme. The recipient will have achieved a high level of academic excellence and demonstrated involvement in extra curricular activities. The Scholarship will be renewable for up to three or four years depending upon the duration of the undergraduate programme provided that the student maintains the required academic standing. Recipients are to be Canadian citizens (or landed immigrants) and residents of Nova Scotia for at least three years.

The Hugh J. Potter Scholarship

An endowment has been established to provide a scholarship to an entering Commerce student who has demonstrated a high level of academic achievement. First preference will be given to residents from Digby County who qualify based on their academic record. The scholarship honours the memory of Joseph Hugh Potter, a native of Digby County, who showed himself to be an exceptional initiator and developer of financial and commercial activity throughout this province in the fields of insurance, securities, shipbuilding, transportation and manufacturing.

Shatford Memorial Trust Scholarships

The J.D. Shatford Memorial Trust has 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: 1) be coming directly to Dalhousie from either Forest Heights Community High School or Sir John A. Macdonald High School; 2) 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 as defined elsewhere in this Calendar. Please note that the value of a holder's scholarship may vary from year to year. Entrants will be considered after receipt of the list from the US bank trustee.

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

The I.C. Stewart Trust Fund

From the Estate of Georgie 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 Registrar's Office - Awards.

Marguerite I. Vernon Scholarship

A trust has been established under the Will of the late Marguerite Vernon whereby, from time to time, a scholarship will be assigned to Dalhousie University for an entering student.

3. Entrance Scholarships in the Portfolio to Fund Generic Scholarships (Internal Assignment)

The scholarships listed in this section are used for funding purposes; one does not apply for them.

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 Registrar's Office. The fund provides in-course scholarships also.

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.

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.

Frederick A. MacMillen Scholarships

The late Frederick A. MacMillen 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 McInnes Memorial Scholarships

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

Silvanus A. Morton Memorial Scholarship

The Silvanus A. Morton Scholarship Fund was established in 1972 to endow one or more awards. 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.

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 established a scholarship on the occasion of the hundredth anniversary of the academy.

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.

Dr. David M. Soloan Scholarship

Under the Will of the late Dr. David M. Soloan 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 Duncan Stewart has made possible the funding of undergraduate scholarships.

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. Failing a candidate from these areas, a student from other areas of Nova Scotia may be selected 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 Skalling 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.)

E. Canada Scholarships

The federal government's Canada Scholarship Programme awards over 2,500 scholarships annually to students in undergraduate studies in selected natural and physical sciences or engineering studies. The scholarship can be worth up to \$10,000 received as \$2,500 annually over four years. Effective for the 1995/96 academic year, the government discontinued the programme for entrants.

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 Registrar's Office - Awards, or:

The Canada Scholarships Programme
Awards Division
Association of Universities and Colleges of Canada
151 Slater Street
Ottawa, Ontario
K1P 5N1
Telephone: (613) 563-1236

Please note that Canada Scholars who chose early graduation and return (immediately the next year) for either an Honours or an Advanced Major Certificate, are eligible to retain their Canada Scholarship subject to the other criteria. We request that we be included in your plans beforehand so that your scholarship does not automatically become terminated with graduation.

F. The Canadian Merit Scholarship Foundation

The programme 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 3.30 (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 programme which the student wishes to undertake.

III. 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 generic scholarships. The normal full class load will depend upon the requirements of specific faculties and schools. The Registrar's Office (Awards) 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 A through F.

Please note that the automatic consideration is either for the renewal of an entrance renewable scholarship or for a one-year scholarship, but not both. Holders who fail to re-qualify for their renewable scholarship will be notified in writing.

Applications are not required for the scholarships which are listed in sections A through F. These are endowments which the University assigns to fund students' generic scholarships.

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 undergraduate, 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 Arta 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. Architecture

Until the new Student Information System becomes operational, those students in the Bachelor of Environmental Design Studies programme will be assessed for University scholarships under interim procedures. Contact the Registrar's Office. In lieu of endowments, operating funds will be used.

C. Arts and Science

Nathan T. Ashkins Scholarship

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

Robert Bruce Scholarship

Robert Bruce of Banlieue, 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 a scholarship beyond first year.

D. Arts

Dr. Frederick J. Gaudet Scholarship

Dr. Gaudet bequeathed to the University in 1978 a sum of money to provide for a 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.

E. Commerce

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 Scotian 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.

F. Computer Science (i.e. BCS students only)

Until the new Student Information System becomes operational the assessment of student's records will occur under interim procedures. Contact the Registrar's Office.

G. Engineering

Until the new Student Information System becomes operational, the assessment of students' records will occur under interim procedures. Contact the Registrar's Office.

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 Mr. and Mrs. S.H. Solomon Scholarship in Engineering

This scholarship was made 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.

H. 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 Registrar's Office 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.

I. Other

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

1. By Application or Nomination Only

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 Scholarship Committee. NOTE: This scholarship requires a designated application form which must be submitted to the Registrar's Office - Awards by the May deadline.

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 3.30) 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 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 3.00, demonstrated activity in the Halifax Chapter and financial need.

2. By University Selection Only

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 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 class load of at least five full classes (or equivalent). The scholarship is normally assigned mid-summer.

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.

Maritime Life Scholarship

Under the terms of the Trust, an annual scholarship is available to a student who has completed one year of an undergraduate programme and who has demonstrated a high standard of academic achievement.

Dharma Master Chuk Mor Scholarship

This scholarship is available to a student who has attained a high standard of academic achievement and who has completed a minimum of one year in an undergraduate programme.

J. Faculty, Departmental, School and College Scholarships

These scholarships are administered by the academic unit. They are grouped by key field of study.

Architecture, Faculty of

Unless otherwise noted, selection for these awards is carried out by the Faculty of Engineering Scholarships and Awards Committee, augmented by representatives from Architecture and Computer Science. Application forms are available from the offices of the appropriate dean, or the Office of the Associate Dean of Engineering.

75th Anniversary Alumni Family Scholarship

The DalTech Alumni Association established this annual award of \$1750 in 1995 in recognition of the 75th anniversary of the DalTech Alumni Association. The recipient must be registered in the penultimate or final year of a professional programme at DalTech, have achieved satisfactory academic standing, and be a family member (son/daughter, spouse, grandchild, niece/nephew, brother/sister) of a DalTech graduate. Application deadline: September 30.

The Harry Kitz Fund

Interest from the fund that has been established in the memory of the late Harry Kitz is used to support a student of the School of Architecture. This award is open to students in year two of Architecture who are undertaking approved activities relating to the provision or design of equipment or buildings for playgrounds, parks or recreational improvements to public property in the Halifax Regional Municipality. An award or awards will be made after consideration of proposals submitted. Imagination, practicality, and potential value to the community will be criteria used in assessing the submission. Application deadline: January 31. Apply to Faculty of Architecture

L.E. Shaw Design Scholarship

L.E. Shaw Limited established this award, valued at tuition fees for year two of Architecture. Faculty members nominate the student who is deemed to have derived the greatest benefit from the Design Class during year one. Apply to Faculty of Architecture.

Mazankowski Foundation Entrance Scholarship

This foundation has established an \$1,100 award for a student who fulfils or is expected to fulfil the minimal entrance requirements into Undergraduate Architecture or year three of the Bachelors of Computer Science or Engineering. Application deadline: April 30.

The Medjuck Architectural Design Scholarship

The Centennial Group of Companies Limited established this award for a student with an outstanding record of design in year one. The successful applicant is selected at the year one review in August and receives the scholarship at the start of term B5 the following January. No application is required. Apply to Faculty of Architecture.

The Newfoundland Association of Architects William J. Ryan Memorial Scholarship

The Newfoundland Association of Architects established this \$1000 award to an Architecture student entering year two. Faculty nominations are solicited for selection of the Newfoundland student (who was born and raised in the province; or had lived in the province for a minimum of three years prior to entrance into a university in the province) who demonstrates: (a) the best design ability as it relates to the Atlantic region, and in particular to Newfoundland; (b) practicality of design and ability to show that he or she can make the solution workable; (c) aptitude for a particular or several aspects, other than design of architecture and the built environment; (d) an indication of the development of professional ability; (e) highest overall marks in classes of study other than design; (f) financial need, if candidate is equal to others in at least three of the other criteria. Apply to Faculty of Architecture.

Newfoundland and Labrador Alumni Undergraduate Scholarship

This award of \$1000 was established by the St. John's Newfoundland Alumni Branch to a student registered in the second year at DalTech. The scholarship is awarded primarily on the basis of the applicant's academic record (first class mandatory) with preference given to students who were residents of Newfoundland and Labrador immediately prior to attending DalTech. The selection committee may weigh other considerations in reaching a decision. Application deadline: September 30.

President's Associates Entrance Scholarship

The President's Associates Entrance Scholarship has been made possible by members of the Associate's Programme (1994-96). The members represent business, industry, friends, faculty and university administrators. This award of \$1000 is made annually to a student in undergraduate Architecture, Computer Science or Engineering on the basis of the academic record. Candidates must have fulfilled or expect to fulfill the entrance requirements for an undergraduate degree programme in Architecture or for entrance into third year of Engineering or Computer Science. Application deadline: April 30.

Arts & Social Sciences, Faculty of

1. English

Allan 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.

2. 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:

- (1) A programme of study at the Université d'Aix-en-Provence, France, or
- (2) An off-campus summer class 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.

3. 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.

4. Music

The Bornoff/Garamie Memorial String Scholarship

A scholarship will be given to a student who is entering the Third- or Fourth-Year of a music degree programme who in the opinion of the Department has demonstrated outstanding talent as a string player. The fund was established to honour the memory of two significant string music teachers, George Bornoff and Arthur Garamie.

The James and Abbie Campbell Memorial Scholarships and the James and Abbie 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.

Halifax Ladies Music Club Scholarship

The Halifax Ladies Music Club sponsors an annual scholarship of \$300 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 Ross Scholarships in Music

An endowment fund of \$25,000 was established under the Will of the late Effie May Ross. 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:

- (1) Be enrolled in the classes in classroom teaching methods and field experience at either the elementary or secondary level;
- (2) Be studying voice; and
- (3) 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:

- (1) 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
- (2) Be studying a band or orchestral instrument; and
- (3) Have shown outstanding achievement in the above classes.

5. 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.

Computer Science, Faculty of

Unless otherwise noted, selection for these awards is carried out by the Faculty of Engineering Scholarships and Awards Committee, augmented by representatives from Architecture and Computer Science. Application forms are available from the offices of the appropriate dean, or from the Office of the Associate Dean of Engineering.

75th Anniversary Alumni Family Scholarship

The Daltech Alumni Association established this annual award of \$1750 in 1995 in recognition of the 75th anniversary of the Daltech Alumni Association. The recipient must be registered in the penultimate or final year of a professional programme at Daltech, have achieved satisfactory academic standing, and be a family member (son/daughter, spouse, grandchild, niece, nephew, brother/sister) of a Daltech graduate. Application deadline: September 30.

Bruce and Dorothy Rosetti Engineering Entrance Scholarships

The Bruce and Dorothy Rosetti bequest provides five \$1000 scholarships to candidates who have fulfilled or expect to fulfil the minimum entrance requirements for year three in an undergraduate programme in the Faculties of Engineering and Computer Science. Deadline: April 30.

Bruce and Dorothy Rosetti Engineering Undergraduate Scholarships

The Bruce and Dorothy Rosetti bequest provides five \$1000 awards to undergraduate students in the penultimate year of a programme in Engineering or Computer Science. Selection is made on the basis of the students' academic record while in attendance at this university. Deadline: September 30.

Mazankowski Foundation Entrance Scholarship

This foundation has established an \$1,100 award for a student who fulfils or is expected to fulfil the minimal entrance requirements into Undergraduate Architecture or year three of the Bachelors of Computer Science or Engineering. Application deadline: April 30.

The Walter Gardner Stanfield Entrance Scholarships

The Walter Gardner Stanfield bequest provides for four \$1000 awards to candidates who fulfill or are expected to fulfil the minimum (entrance) requirements into third year of Engineering or Computer Science. The awards are made on the basis of the applicants' academic record at the Associated University. Deadline: April 30.

Newfoundland and Labrador Alumni Undergraduate Scholarship

This award of \$1000 was established by the St. John's Newfoundland Alumni Branch for a student registered in the second year at Daltech. The scholarship is awarded primarily on the basis of the applicant's academic record (first class mandatory) with preference given to students who were residents of Newfoundland and Labrador immediately prior to attending Daltech. The selection committee may weigh other considerations in reaching a decision. Application deadline: September 30.

President's Associates Entrance Scholarship

The President's Associates Entrance Scholarship has been made possible by members of the Associate's Programme (1994-96). The members represent business, industry, friends, faculty and university administrators. This award of \$1000 is made annually to a student in undergraduate Architecture, Computer Science or Engineering on the basis of the academic record. Candidates must have fulfilled or expect to fulfil the entrance requirements for an undergraduate degree programme in Architecture or for entrance into third year of Engineering or Computer Science. Application deadline: April 30.

Engineering, Faculty of

1. Year One (Entrance) Scholarships

The A. David Blair Scholarship

An endowment has been established to provide an annual scholarship in memory of A. David Blair, who was graduated from Dalhousie in 1987 with a BSc degree. Candidates for the scholarship will be those who have fulfilled the requirements for promotion from Year II to Year III in the Dalhousie Faculty of Engineering. The awardee will have achieved high academic standing and demonstrated financial need.

The James L. Hall Scholarship in Earth Sciences

This scholarship is awarded on the joint recommendation of the Faculty of Engineering and the Department of Earth Sciences, to a student who has completed his/her first year, who is planning on a career in the field of Mining Geology. The scholarship alternates between Engineering and Earth Sciences.

John R. Kaye Memorial Scholarship

In 1981 a scholarship was established in memory of Mr. John R. Kaye, a notable engineer who served as Chairman of the Board at the Technical University of Nova Scotia, and received an honorary doctorate degree in 1961.

The Benefactor's purpose in establishing this scholarship is to provide financial assistance to an engineering student who is a native-born Nova Scotian, and a well-rounded individual. The successful candidate will be among those who have fulfilled the requirements for promotion from Year II to Year II in the Dalhousie Faculty of Engineering. S/he will be academically sound and will have demonstrated motivation, diligence, and promise in succeeding and being a credit to the engineering profession.

John Frederick Knodell Engineering Scholarship

An annual award of \$5,000 has been established to honour the memory of J.F. Knodell, a graduate in electrical engineering from Dalhousie and Nova Scotia Technical College. The scholarship is awarded to a male Dalhousie engineering student who was born in Nova Scotia and attended schools in the province. The successful candidate will be among those who have fulfilled the requirements for promotion from Year II to Year III in the Dalhousie Faculty of Engineering. The recipient must have achieved excellent academic standing and demonstrated significant improvement from the first to second year of the engineering diploma programme.

2. Year Three (Entrance) Scholarships

Unless otherwise noted, applicants for these awards apply to the Scholarships and Awards Committee of the Faculty of Engineering. Students applying from Associated Universities for Third Year (formerly known as Entrance) Scholarships may obtain application forms from the Director/Head/Chair of Engineering at the Associated University or through the Office of the Associate Dean of Engineering at Daltech. Unless otherwise noted, the application deadline for awards in this section is April 30.

Margaret Archibald Memorial Entrance Scholarship

The Family, Friends and Associates of Margaret Archibald established this award of \$1000. Mrs. Margaret Archibald was a DalTech employee from December 1962 to May 1979. During this period of time, she worked for three Presidents. After her official retirement as Administrative Secretary to the President, Mrs. Archibald continued with the University working in the Public Relations Office until 1983. Margaret Archibald was a very loyal and dedicated employee with a keen interest in DalTech community. The eligible candidate must be a woman who has fulfilled or expects to fulfill the minimum entrance requirements into third year of an undergraduate programme at DalTech. Preference will be given to women pursuing a career in engineering.

Atlantic Farm Mechanization Show Entrance Scholarship

The Atlantic Farm Mechanization Show established this award of \$500. Eligible applicants are Canadian citizen/landed immigrant, residents of Atlantic Canada who are entering the Biological Engineering Programme at Daltech. The scholarship is awarded on the basis of applicant's academic record at the Associated University or the previous years at Dalhousie with particular emphasis on

performance in the machinery related classes - statics, strength of materials, dynamics of particles and dynamics of rigid bodies. The award is made on the recommendation of the Head of the Department of Biological Engineering in consultation with the director of the student's Associated University and with the faculty members of the Department of Biological Engineering.

Atlantic Farm Mechanization Show Environmental Engineering Entrance Scholarship

The Atlantic Farm Mechanization Show established this award of \$500. The scholarship is awarded on the basis of applicant's academic record in the three terms taken at the Nova Scotia Agricultural College in the Environmental Engineering Option in Biological Engineering. Candidates must have fulfilled all the programme requirements at the Nova Scotia Agricultural College. Selection will be carried out by the Scholarships and Awards Committee of the Faculty of Engineering in consultation with the Head of the Department of Biological Engineering in January after students come to DalTech. Application Deadline: January 30.

The Electrical and Computer Engineering Faculty Entrance Scholarship

Faculty Members of the Department of Computer and Electrical Engineering established this award of \$1,000. Candidates must have fulfilled or expect to fulfil the minimum entrance requirements into third year of an undergraduate programme in the Faculty of Engineering in Electrical and Computer Engineering. Selection is carried out by Scholarships and Awards Committee of the Faculty of Engineering on the recommendation of the Electrical and Computer Engineering Department.

Faculty of Engineering Entrance Scholarships

Five awards valued at \$500 each are open to students entering third year of an Engineering program. The awards are made on the basis of the applicant's academic record at the Associated University or the initial years of Engineering studies at Dalhousie.

Industrial Engineering Entrance Scholarship

This scholarship of \$1000 is awarded to a student entering DalTech who has selected the programme of Industrial Engineering and who has achieved a high academic standing within his/her prior university studies. Participation in extracurricular activities will also be given consideration. Candidates must have fulfilled or expect to fulfil the minimum entrance requirements into third year for the undergraduate programme in the Faculty of Engineering.

The Mazankowski Foundation Entrance Scholarship

The Mazankowski Foundation has established an award valued at \$1,100. Eligible candidates must have fulfilled or expect to fulfil the minimum entrance requirements into Undergraduate Architecture or into the third year of an undergraduate programme in the Faculty of Engineering or Faculty of Computer Science. The Scholarship is awarded on the basis of the applicant's academic record at the Associated University or Dalhousie University. The Committee may also weigh financial and other considerations in reaching a decision.

Gordon C. McCausland Entrance Scholarship

Mrs. Elizabeth C. McCausland established this award of \$1,000. Eligible candidates must have fulfilled or expect to fulfil the minimum entrance requirements into third year of the undergraduate Civil Engineering programme in the Faculty of Engineering. The award is made on the basis of the applicant's academic record at the Associated University or at Dalhousie. Selection is carried out by the Scholarships and Awards Committee of the Faculty of Engineering on the recommendation of the Department of Civil Engineering.

The Metallurgical Faculty Entrance Scholarship

The Metallurgical Faculty Members of the Department of Mining and Metallurgical Engineering established this award of \$1,000. Eligible candidates must have fulfilled or expect to fulfill the minimum entrance requirements into third year of an undergraduate programme in the Faculty of Engineering in the field of Metallurgical Engineering.

Minas Basin Pulp and Power Company Limited Entrance Scholarships

The Minas Basin Pulp and Power Company Limited established three awards of \$1,000 each. Eligible candidates must have fulfilled or expect to fulfil the minimum entrance requirements into year three of an engineering undergraduate programme in the Faculty of Engineering. The award is made on the basis of the applicant's academic record. The Committee may also weigh financial and other considerations in reaching a decision.

Guru Nanak Scholarship

Dr. and Mrs. D.S. Chehil established this scholarship to encourage black Nova Scotia students to qualify for admission and complete the engineering degree at DalTech. This award of \$1,000, is tenable for up to three years or more, subject to maintenance of an acceptable academic average. Eligible candidates must be black Canadians born in Nova Scotia. The Scholarship is awarded primarily on the basis of the applicant's academic record prior to admission into third year or on the basis of the academic record at an Associated University or, if so determined, at the University entrance level. Other factors such as personality, initiative, community involvement and other awards held by the applicant may also be considered.

Nova Scotia Power Centennial Scholarship

The Nova Scotia Power Inc. established four awards valued at \$1,500 per year, tenable for three years. Eligible candidates are registered in the Faculty of Engineering at this University in one of the following fields of Study: Electrical, Mechanical, Civil, or Industrial Engineering. The Selection Board considers academic excellence, personality, and involvement in extracurricular activities.

The Nova Scotia Women in Engineering Scholarship

The Province of Nova Scotia established this award valued at \$5000 renewable for another year. Applicants must demonstrate academic excellence, leadership ability, and contribution to school/community activities. Eligible candidates must be women graduates of Nova Scotia high schools, residents of Nova Scotia and entering their third year of an undergraduate engineering programme at DalTech.

President's Associates Entrance Scholarship

The President's Associates Entrance Scholarship has been made possible by members of the Associate's Programme (1994-96). The members represent business, industry, friends, faculty and university administrators. This award of \$1000 is made annually to a student in undergraduate Architecture, Computer Science or Engineering on the basis of the academic record. Candidates must have fulfilled or expect to fulfil the entrance requirements for an undergraduate degree programme in Architecture or for entrance into third year of Engineering or Computer Science.

Bruce and Dorothy Rosetti Engineering Entrance Scholarships

Five awards of \$1,000 each were established from the Bruce and Dorothy Rosetti bequest. Candidate must have fulfilled or expect to fulfil the minimum entrance requirements for entrance into third year an undergraduate programme in the Faculty of Engineering. The Scholarship is awarded on the basis of the applicant's academic record at the Associated University or in the initial programme years at Dalhousie.

The Walter Gardner Stanfield Entrance Scholarships

The Walter Gardner Stanfield Bequest has established two awards, valued at \$1,000 each, for students registered in undergraduate Engineering or Computer Science. Engineering applicants must have fulfilled or expect to fulfil entrance requirements into third year of Engineering.

The Everett Patterson Memorial Entrance Scholarship

Ocean Contractors Limited established this award of \$1000. Professor Patterson graduated from the Nova Scotia Technical College (TUNS) Civil Engineering in 1960. He taught at Dalhousie University in the Engineering Department for 27 years. During that time, he served as chairman of the department from 1976-1979 and again in 1983. Professor Patterson was a very dedicated teacher and faculty member who was highly respected by his students and colleagues both at Dalhousie and TUNS. This award is made on the

basis of the applicant's record at Dalhousie University. Candidates must have fulfilled or expect to fulfil the minimum entrance requirements into third year of an undergraduate programme in the Faculty of Engineering.

Women's Association of the Mining Industry of Canada Foundation Entrance Scholarship

The Women's Association of the Mining Industry of Canada Scholarship Foundation established this award \$1,000. Eligible candidates are Canadian students entering the third year of the Mining Engineering Programme. The Scholarship is made on the basis of the applicant's academic record with due consideration of the applicant's financial needs.

3. In-course Undergraduate Scholarships - Years three, four and five: Faculty of Engineering

Unless otherwise stated, selection for these awards is made by the Scholarships and Awards Committee for the Faculty of Engineering. Application forms are available from the Office of the Associate Dean of Engineering. Application deadline for these awards is September 30 unless otherwise indicated.

75th Anniversary Alumni Family Scholarship

The DalTech Alumni Association established this award in 1995 in recognition of the 75th anniversary of DalTech Alumni Association. This award of \$1,750 is open to students registered in the penultimate or final year of a professional programme at DalTech. The recipient must be a family member (son/daughter, spouse, grandchild, niece/nephew, brother/sister) of a DalTech graduate and have achieved satisfactory academic standing.

Allan D. Nickerson Memorial Scholarship

This scholarship, valued at \$2000, was made possible by a bequest from the estate of the late Allan D. Nickerson. It was established in memory of Allan D. Nickerson to promote academic excellence in Engineering studies. It is awarded primarily on the basis of the applicant's academic record (first class standing). Mr. Nickerson graduated from the Nova Scotia Technical College (Electrical Engineering, 1929). He received an Honorary degree (D.Eng.) from the College in May, 1969.

APENS Engineering Centennial Scholarship

The Association of Professional Engineers of Nova Scotia established this \$3000 scholarship as an on-going reminder and celebration of the 1887 to 1987 Centennial of Canadian Engineering. Eligible candidates are Nova Scotia Students entering the final year of an undergraduate engineering programme in the Faculty of Engineering. The Scholarship is awarded on the basis of the applicant's academic record while in attendance at this University. While academic excellence will be the primary criterion for the award, the Selection Committee may also weigh other considerations in reaching a decision.

The Armed Forces Communications and Electronics Association (AFCEA) Education Fund of Canada Scholarship

The AFCEA Education Fund of Canada offers a scholarship of \$1000 to the top Canadian student completing his fourth year of studies in the Department of Electrical and Computer Engineering. Selection is based on academic excellence.

ASHRAE Halifax Chapter Scholarship

The American Society of Heating Refrigerating and Air-conditioning Engineers, Halifax Chapter has made available an award valued at \$500. Eligible students are Mechanical Engineering students with thermal sciences emphasis, and special interest in heating, ventilating and air-conditioning who are entering the final year of studies. The scholarship is awarded on the basis of the applicant's academic record while in attendance at this University. Whereas academic excellence will be the primary criterion for the award, other considerations may be taken into account in reaching a decision. A one page essay explaining the applicant's interest in heating, ventilation and air-conditioning will be required with the application form, and this essay will be considered as part of the evaluation.

Dr. Max L. Baker Scholarship

An anonymous donor established this award of \$1,000 for students registered in the Senior Year of the Faculty of Engineering. The recipient will be selected on the basis of personality, leadership and scholarship. The letter of nomination on application should convey to the Committee the reasons the nominee or applicant is deemed worthy of the award. The Committee will accept either nominations or applications, in the form of a letter addressed to the Associate Dean of Engineering.

The Dr. Alan E. Cameron Scholarship

An anonymous donor established this award of \$1,000 for students registered in the Senior Year of the Faculty of Engineering. The award is based primarily on the academic record of the applicant during the Junior Year, but will also take into account the personality, leadership ability and financial need of the applicant.

CBCL Limited, Consulting Engineers, Scholarship

CBCL Limited, Consulting Engineers established this award valued at \$1,000. Eligible students are registered in year four or five of Civil, Industrial, Mechanical or Electrical Engineering programs in the Faculty of Engineering. The Scholarship is awarded primarily on the basis of the applicant's academic record. Other factors such as personality, initiative, community involvement, other awards held by the applicant, etc. may also weight in the decision.

The Dr. H.W.L. Doane, F.E.I.C. Scholarship

Nova Scotia Power Inc. established this scholarship valued at \$400 in 1981 in recognition of dedicated service rendered by Dr. Doane as a member of the Nova Scotia Power's Board of Directors from 1953 to 1981. A distinguished engineer, Mr. Doane graduated from DalTech in 1913, was invested as an Honorary Doctor in 1957; was presented with the Sexton Memorial Award in 1964; and was honorary president of the University's Alumni Association. Eligible students are Nova Scotia students registered in the Senior Year Civil Engineering in the Faculty of Engineering. The recipient will be selected on the basis of academic achievement, leadership ability and qualities of personality and character.

Dow Chemical Canada Scholarship

Dow Chemical Canada Inc. established this award valued at \$900 to the recipient plus \$450 to the Department of Chemical Engineering. Candidates must be in the final year of the Chemical Engineering undergraduate engineering program. The scholarship is awarded primarily on the basis of the applicant's academic record. Other factors such as leadership in extra-curricular activities and other awards held by the applicant, etc., may also weigh in the decision.

Fairey Canada Scholarship

Fairey Canada Ltd. established this award valued at \$150. Eligible students are registered in Year four of Mechanical Engineering in the Faculty of Engineering. The award is based on the academic record of the applicant and the financial need of the applicant. Preference will be given to a native of the Atlantic Provinces and applicants are expected to have an interest in some aspect of aviation.

David F. Fanning Scholarship

This award of \$1000 was established in memory of David F. Fanning by his family and fellow members of the Civil Engineering class of 1980. Eligible students are Canadian students registered in the penultimate year of the Civil Engineering program. The scholarship is awarded on the basis of the applicant's academic record while in attendance at this University. Preference will be given to a student who has displayed an indicated interest in mathematical modelling and finite element analysis of structures.

Marc Garneau, P.Eng. Scholarship

The Association of Professional Engineers of Nova Scotia (APENS) established two awards of \$2000 to commemorate the journey of the first Canadian astronaut, Marc Garneau, into space on October 5, 1984. Dr. Garneau is an honorary life member of APENS and he honored the Association by carrying its insignia on this historic flight. Eligible students are Nova Scotia students registered in the fourth and fifth years of an undergraduate engineering programme in the Faculty of Engineering. The scholarship is awarded on the basis of the applicant's academic record while in attendance at this

University. While academic excellence will be the primary criterion for the award, the Selection Committee may also weigh other considerations in reaching a decision.

The John J. Jodrey Scholarship

John J. Jodrey established this award valued at \$ 2,000. Eligible students are Atlantic Canadian students registered in the penultimate year of an Engineering program. The scholarship is awarded on the basis of the applicant's academic record while in attendance at this University.

J. Douglas Klina Memorial Scholarship

The Halifax Water Commission established this award of \$1,000. Eligible students are Nova Scotia students registered in the final year of the undergraduate Civil Engineering programme in the Faculty of Engineering. The applicant must be involved in water-related studies in Civil Engineering. The scholarship is awarded on the basis of the applicant's record while in attendance at this University. While academic excellence will be the primary criterion for the award, the selection committee may also weigh other considerations in reaching a decision.

The Donald MacFadgen Memorial Scholarship

The Mining Society of Nova Scotia has established this award of \$500. Eligible students are registered in the Junior Year of the Faculty of Engineering. The award is made on the basis of merit and need, with preference given to students enrolled in the Department of Mining and Metallurgical Engineering.

A.R. MacPherson Scholarship

The Bechtel Foundation of Canada has established this \$1,500 scholarship in recognition of Mr. A.R. MacPherson, a former Vice-President of Bechtel Canada Limited. A distinguished mining engineer, Mr. MacPherson graduated from Tech in 1934. He is the first Canadian recipient of the Robert H. Richards Award by the American Institute of Mining, Metallurgical and Petroleum Engineers and is a "Distinguished Member" of the Society of Mining Engineers. This award is intended to be made each year, but is subject to annual review by Bechtel Canada. The full amount is to be distributed each year in whole or in parts at the discretion of the Associate Dean of Engineering in a manner which shall not serve to reduce the amount of any government loan and/or grants for which the recipients may otherwise be eligible. Student must be a graduate(s) of a Canadian secondary school and be entering year four or five of the Engineering class. Selection is made based on excellence in scholastic standing and on financial need. Bechtel Canada is to be informed of the name(s) of the recipient(s) and of his/her/their academic progress at the end of the scholastic year.

The Dr. S.K. Malhotra Scholarship

The \$1,500 scholarship was established by his family and friends in memory of Dr. S.K. Malhotra, former Dean of Graduate Studies and Professor for Civil Engineering at DalTech from 1965 to 1990. Eligible students are registered in the penultimate academic study term of the Civil Engineering Programme of the Faculty of Engineering. The scholarship is awarded on the basis of the applicant's academic record while in attendance at this University. Preference will be given to a student who had displayed an interest in the field of structural engineering.

Maritime Life Scholarship (Engineering)

The Maritime Life Assurance Company established this award of \$1000. Eligible students are registered in the Junior year of the Faculty of Engineering. The scholarship is awarded based on the applicants academic record while in attendance at this University.

The George Geoffrey Meyerhof Scholarship

Dr. George Geoffrey Meyerhof established this award valued at \$1000. Eligible students are registered in the Senior Year of Civil Engineering in the Faculty of Engineering. The award is based primarily on the academic record of the applicant during the Junior year, but will also take into account personality and leadership ability. A letter of nomination or of application should convey to the Committee the reasons the nominee or applicant is deemed worthy of the award. Selection will be carried out by the

Scholarships and Awards Committee of the Faculty of Engineering in consultation with the Head of the Department of Civil Engineering.

Mobil Oil Canada Scholarships

Mobil Oil Canada Ltd. established three scholarships valued at \$2,000 each. Eligible students are to be registered in the Senior Year of the Faculty of Engineering. Preference will be given to Canadian citizens or landed immigrants. The award is based on the academic record of the applicant while in attendance at this University.

Newfoundland and Labrador Alumni Undergraduate Scholarship

This award, valued at \$1,000, was established by the St. John's Newfoundland Alumni Branch. The Scholarship is awarded primarily on the basis of the applicant's academic record (first class mandatory), with preference given to students who were residents of Newfoundland and Labrador immediately prior to attending DalTech. The selection committee may weigh other considerations in reaching a decision. The student must be registered in Year four at DalTech in a programme in Architecture, Engineering, or Computer Science.

Positron Engineering Scholarship

Positron Industries, Inc. established this award of \$1,000. Eligible students are registered in the penultimate year of an Electrical and Computer Engineering programme in the Faculty of Engineering. The Scholarship is awarded primarily on the basis of the applicant's academic record. Scholarship preference will be given to a DalTech student who excels in electronics. Other factors such as personality, initiative, community involvement, other awards held by the applicant, etc. may also weigh in the decision.

Positron Engineering Scholarship

Positron Industries Inc. has also established another scholarship of \$1,000 tenable for one year. Eligible students are registered in the Senior Year in Electrical and Computer Engineering. The scholarship is awarded on the basis of the applicant's academic standing of at least 'A' in relevant classes among communications, electronics or computer engineering. Application deadline: September 30.

Bruce and Dorothy Rosetti Engineering Undergraduate Scholarships

The Bruce and Dorothy Rosetti Bequest has established five \$1000 awards for students who are registered in the penultimate year of a programme in the Faculty of Engineering or Computer Science. The Scholarship is awarded on the basis of the applicant's academic record while in attendance at this University.

Stora Forest Industries Scholarship in Engineering

Stora Forest Industries has established three awards of \$1,000 each to commemorate the 25th anniversary of the company in Nova Scotia. Eligible students are Nova Scotia students registered in the penultimate year of an undergraduate engineering programme in the Faculty of Engineering. The Scholarships are awarded on the basis of the applicant's academic record while in attendance at this University. While academic excellence will be the primary criterion for the award, the Selection Committee may also weigh other considerations in reaching a decision. (Under review.)

Telephone Association of Professional Engineers D.C. (Doug) Johnston Award

The Telephone Association of Professional Engineers established this award of \$200 in memory of D.C. (Doug) Johnston. Eligible students are registered in the Junior Year of the Electrical and Computer Engineering programme of the Faculty of Engineering. The award is based on the academic record of the applicant during the Sophomore Year of studies at DalTech.

The Weldon Scholarship

The Estate of Dr. R.S. Weldon established this award valued at \$450 per year. It is renewable for two years, subject to maintenance of a high academic standing. Eligible students are to be registered in the Mechanical Engineering programme in the Faculty of Engineering of this University. The award is based on the academic record of the applicant during Year three of the programme.

Management, Faculty of

1. School of Business Administration

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 COMM 1101, 1102, 2111. The endowment for this scholarship was provided by friends and co-religionists of the late Professor Berman.

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 class and who plans to enter articles with a practising firm of Chartered Accountants.

The Eaton Foundation Scholarship in Business Studies

A scholarship will be awarded annually to a student entering fourth year in the Commerce programme who has the highest average mark in Introduction to Marketing, Buyer Behaviour, and Marketing Research, and who has demonstrated high academic standing throughout his or her previous years of study. The award was established by the Eaton Foundation, a philanthropic organization dedicated to supporting the arts, education, health, and social welfare across Canada with the generous support of the T. Eaton Co. Limited and Mr. John David Eaton.

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 class, of which one class must be in accounting.

Knight, Bain, Seath, Holbrook Atlantic Limited 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

This scholarship was established in recognition of the distinguished service rendered by Ronald G. Smith. 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.

Science, Faculty of

1. 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.

2. 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.

3. 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.

Canadian Institute of Mining and Metallurgy Earth Science Scholarship for New Brunswick Students

This is awarded to a student entering second or subsequent year in an earth science discipline. Applicants must have been in New Brunswick or resided in New Brunswick for seven years, or have his or her immediate family resident in that province.

Canadian Society of Exploration Geophysicists Scholarship

This scholarship is available to a student applicant who is pursuing a course of studies directed toward a career in exploration geophysics in industry, teaching or research.

Chamber of Mineral Resources of Nova Scotia Scholarship

Senior students from Acadia University, Dalhousie University, St. Francis Xavier University or Saint Mary's University in a geology or mining-related bachelor degree programme are considered for this scholarship. The selection is based upon the student's contribution to the development of the province's mineral resources sector as well as scholastic achievement.

The James L. Hall Scholarship in Earth Sciences

This scholarship is awarded on the joint recommendation of the Faculty of Engineering and the Department of Earth Sciences, to a student who has completed his/her first year, who is planning on a career in the field of Mining Geology. The scholarship alternates between Earth Sciences and Engineering.

4. 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.

5. 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 class in Mathematics, and who has maintained at least a second-class standing during the first three years of the course.

Health Professions, Faculty of

1. College of Pharmacy

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 \$500 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 \$500 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 \$500 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 \$1,650 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.

2. 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-session 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 geriatrics 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.

3. School of Health and Human Performance

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. Apply through the School.

The VIIth 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. 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.

4. 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.

IV. Undergraduate Prizes, Medals, and Awards

A. 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 a 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 number of awards that recognize the contribution to University life that student athletes make. Candidates must have been a full-time student for at least two semesters in an academic year at Dalhousie, must have a minimum Grade Point Average of 2.00 in four full-year classes or equivalent and must have participated on a varsity team during the previous year of study. A number of awards up to \$3000 will be offered each year. For information and application forms contact the Department of Athletics & Recreational Services, Dalplex. Completed application forms are to be returned to that Department to be received by June 1st. The Department of Athletics will forward nominations to the Selection Committee, which will make announcements through the Registrar's Office - Awards.

Dalhousie Student Development Awards

A number of awards of up to \$3000 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 3.00 and must have demonstrated leadership ability. Application forms are available from the Department of Athletics & Recreational Services. Completed applications and supporting documents are to be submitted to that Department, to be received by June 1.

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.
Contact the Department of English.

The Clare Murray Fooshee 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 Fooshee, 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 Killam LeBlanc Memorial Award in Healing and the Arts

This award was established to recognize outstanding interdisciplinary initiatives between the arts and the health sciences, and it honours the memory of this former graduate student in English. The competition is open to undergraduate and graduate students in the Faculties of Arts and Social Sciences, Medicine and Health Professions. Faculty may nominate students who have completed an outstanding project, thesis or research essay that combines work in the humanities or the arts with work in medicine or health care. Nomination letters, accompanied with three (3) copies of the candidate's project, thesis or research are to be submitted by 15th April each academic year to the Chair, Kim Rilda LeBlanc Memorial Award Committee, Department of English.

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.

B. General: DalTech

The Alumni Association Medal

The DalTech Alumni Association provides a medal which is awarded at Convocation each year to the graduating student in the University who has exhibited the most outstanding qualities of personality, scholarship and leadership during a course of studies at the Technical University.

Selection is carried out by a Committee appointed by the Awards Committee of the DalTech Alumni Association.

The Governor General's Silver Medal

The Governor General of Canada provides a silver medal which is awarded at Convocation each year to the student in the University who has obtained the highest academic standing in undergraduate studies at DalTech.

The Governor General's Gold Medal

The Governor General of Canada provides a gold medal which is awarded at Convocation each year to the student in the University who has obtained the highest academic standing in a Master's programme at DalTech.

C. Faculty of Architecture

The Henry Adams Medal and Certificates

Value: One medal and two certificates of merit.

Eligibility: Top-ranking graduating students in architecture who have achieved general excellence throughout the four years of their professional program.

Selection: Selection will be carried out by the Faculty of Architecture.

Donor: American Institute of Architects, Washington, D.C.

Application: No application.

Deadline: April 30.

The Alpha Rho Chi Medal

Alpha Rho Chi, National Social-Professional Fraternity of Architecture, awards the Alpha Rho Chi Medal to a graduating senior of the School of Architecture who has shown an ability for leadership, performed willing service for the School, and gives promise of real professional merit through attitude and personality.

The Alumni Memorial Award

This award, which was initiated in 1984 in the memory of Mr. Michael Kravosky, B.Arch. '83, is awarded each year to a graduating student elected by the graduating class for outstanding service to the school in student activities and affairs.

The award is made from the proceeds of the Architecture Alumni Memorial Fund, and is subject to annual review.

The Nova Scotia Association of Architects Prize

The Nova Scotia Association of Architects gives a prize to a student who, in the final year of the Master's course in the Faculty of Architecture, displays an outstanding awareness of the architect's responsibility to society by demonstration in his/her scholarly and design work.

The Royal Architectural Institute of Canada Medal

The Royal Architectural Institute of Canada offers the RAIC Student Medal annually to a graduating student in each School of Architecture in Canada who, in the judgement of the faculty of the respective School, has completed the outstanding final design/thesis for that academic year.

Atlantic Planners Institute Student Award

Value: A trophy or plaque engraved with the recipient's name supplemented by a cash award of no more than \$500 per annum.

Tenure: Awarded annually.

Eligibility: The award will be available to full-time students attending a planning school accredited by the Canadian Institute of Planners in the Atlantic Provinces. The recipient must be in his/her graduating year. The award will be based on merit in terms of the academic achievement and contribution to planning in the community.

Field of Study: Urban and Rural Planning.

Selection: Each eligible planning school should submit a recommendation for one of their students, whom they believe is most deserving of the award, to the Atlantic Planners Institute. Donor or Awarding Agency: Atlantic Planners Institute. Submission Deadline: April 15, unless otherwise determined by API Council.

Adjeleian Award in the Aesthetics of Structures

Number and Value: One/\$1,000. (subject to annual review)

Tenure: One year.

Basis of Award: The award will be granted to the graduating student who demonstrates in a project both aesthetic principles in buildings and bridges, and unified roots of Architectural and Structural Engineering. The award will alternate between Architecture and Civil Engineering.

Eligibility: The award will be made to a graduating student in either the Master of Architecture (First Professional) or Civil Engineering degree programs.

Field of Study: Architecture and Structural Engineering.

Selection: Selection will be carried out by the Scholarships and Awards Committee of the Faculty of Engineering on the recommendation of one Professor of Structural Engineering, one Professor of Architecture, one Consulting Structural Engineer, and one Consulting Architect.

Donor or Awarding Agency: Dr. John Adjeleian.

Apply to: Application forms may be obtained from the Office of the Dean of Architecture or the Dean of Engineering.

Application Deadline: Architecture -- determined by Faculty; Engineering -- March 31

Canadian Institute of Planners Student Scholarship

Value: A certificate bearing the CIP seal and a book prize.

Basis: The award is made on the basis of academic excellence.

Eligibility: The award will be available to a full-time student member of the Canadian Institute of Planners who has achieved the highest academic standing over the length of the MURP program.

Field of Study: Urban and Rural Planning.

Selection: Award is given on the recommendation of the department of Urban and Rural Planning to a graduating student.

Canadian Institute of Planners Student Scholarship

Value: \$2,000.

Basis: Will be awarded annually in recognition of a thesis, practicum, or major research paper which may be proposed or in progress.

Eligibility: An individual or team may apply. Applicant or team leader must be a student member in good standing with the CIP and must be enrolled full-time in a recognized planning program.

Field of Study: Planning.

Selection: Submission will be judged on the basis of its potential contribution to the planning profession (in theory or practice) or its potential service to a community or a community group.

Apply to: Application forms may be obtained from the Department of Urban and Rural Planning and must be received in the CIP national office by the date specified on the application form.

D. Faculty of Arts & Social Sciences

1. 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.

2. English

Paul McIsaac 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.

3. 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.

4. 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.

5. 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.

6. 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.

7. Music

Dalhousie Alumni Association (Women's Division) Medal in Music
The Women's Division provides an annual medal to the student who achieves the highest cumulative GPA in the programme.

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 Daviss 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.

8. 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.

9. 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.

10. Russian Studies

University Medal in Russian Studies

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

11. 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 Social Anthropology

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

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.

12. 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 Helier 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.

13. 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.

14. 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.

Jonathan Skeete Memorial Prize

Friends, faculty and former students of the Transition Year Programme have established an endowment from which to fund an annual prize. The award honours the memory of Jonathan Skeete who, following completion of the TYP, was graduated with a BComm degree and then served several years with the RCMP. An annual prize is available to a Black student who is enrolled in the Transition Year Programme. Contact the Director of the Programme for details.

E. Faculty of Computer Science

The Digital Equipment of Canada Ltd. Award of Merit

Digital Equipment of Canada Ltd. provides a medal and prize of \$250 which is awarded each year to the student graduating in computer science with the highest overall average in the programme of studies at DalTech.

F. Faculty of Science

1. 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, BIOC 3200, 3300 and 3400.

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.

2. 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'nai B'rith Prize

Two prizes are available annually to students, one for the highest standing in Biology 1000.06 and another for the highest standing in Biology 1001.06.

David Durward Memorial Prize

This prize is to be awarded to the best student in the Physiology of Marine Animals (Biology 3071).

The Dr. Ming Fang Li Memorial Prize in Marine Biology

An endowment has been established to fund an annual prize to a Third-Year student in the Co-operative Education programme in Marine Biology. The recipient will be the one who is deemed to be the best, assessed on academic standing and work term performance.

Ogden Memorial Prize

The Dr. J. C. Ogden memorial Prize is given to the top student in Limnology (Biology 4068) and honours the late Dr. J. C. (Pete) Ogden, an accomplished limnologist. A long-serving member of the Biology Department, Dr. Ogden contributed significantly to the field of aquatic science. He particularly enjoyed teaching the Limnology class.

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.

3. 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.

Walter J. Chute Prize in Chemistry

An endowment has been established to provide an annual prize to a chemistry student, with an outstanding record in organic chemistry, entering his or her final year in the Honours Chemistry programme.

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 programme to that student who has achieved satisfactory academic standing in Third- or Fourth-Year level classes in physical chemistry.

Dr. Oswald 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 2000-level inorganic chemistry class.

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.

4. Earth Sciences

Amoco Canada Petroleum Company Ltd. Award

The company sponsors an award to a student in the fourth and final year of the Honours Earth Sciences programme who has attained at least a B- average, with a concentration in classes relating to petroleum exploration.

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 who has demonstrated both a good academic record and leadership qualities.

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.

Canadian Society of Petroleum Geologists Student Industry Field Trip

The society sponsors a field trip to a third-year Earth Sciences student who has an interest in petroleum geology, sedimentology and stratigraphy. The award consists of travel expenses and most field expenses for a trip to the Sedimentary Basin and Rocky Mountains of Western Canada.

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.

Geological Association of Canada Student Prize

Based on overall academic standing this prize is awarded annually to a student entering fourth year. The prize will consist of a one-year free membership in the GAC and a GAC "Special Paper" volume to be chosen by the recipient.

Michael J. Keen Memorial Award

This award was established to encourage greater participation of women in science. It will be awarded to a female student entering the second year earth science programme who shows an interest in and commitment to the pursuit of a career in science and whose performance is of honours calibre.

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.

Mineralogical Association of Canada Student Prize

This prize is open to an undergraduate student who has completed at least second year and has demonstrated excellence in one of mineralogy, crystallography, geochemistry, petrology and mineral deposits. The recipient will receive his/her choice of one of the MAC special publications.

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 Earth Sciences offers to the top First Class Honours graduate a medal in recognition of superior achievement.

5. 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.

6. 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.

Barry Ward Fawcett Memorial Prize

An endowment has been established to provide an annual prize to a Second-Year student who achieves the highest grade in a class specified by the Department (currently COMP/MATH 2670: Discrete Structures II).

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 classes 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.

7. Microbiology

University Medal in Microbiology

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

8. Physics

The Dr. William J. Archibald 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 a second year Physics programme.

The Professor J.B. and Mrs. H.H. French Prize

A prize of \$1,000 is open to a female student at each of the second-, third- and fourth-year levels. An award is to be made only to those maintaining First Class standing in their programmes. Consideration of honours candidates entering the third and fourth year will be made during May once final grades become available. Consideration of second-year candidates will occur in the fall.

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

These 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 Omsv Sezerman Prize in Physics

A prize of \$500 will be awarded to a student who has completed the best physics honours project in the fiber optics, or a related, field with a grade of at least A-.

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 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 Physics 1000, 1100, 1300, and the PHYS 2000/2005/2010/2015. 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.

Burgess McKittrick Summer Research Studentships in Physics

The Department offers up to two 3-4 month studentships for first year students intending to go into an Honours Physics programme at Dalhousie.

Darrell Montgomery Memorial Prize

An endowment has been set up to provide an annual prize to a third-year student in the Physics 3000A/3010B experimental laboratory 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 class.

9. 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.

Dr. W.K. Honig Prize in Psychology

A fund has been established to provide for one or more annual prizes to students who have achieved the highest performance in the introductory psychology class(es) and who are undertaking a major or honours degree in psychology or neuroscience.

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

The Department of Psychology offers a medal to the top graduating student with First Class Honours in the programme.

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.

G. Faculty of Engineering

Adjeleian Award in the Aesthetics of Structures

Dr. John Adjeleian established this award of \$1,000 to be made to a graduating student in either the Faculty of Architecture, Master of Architecture (First Professional), or Civil Engineering. The award will be granted to the graduating student who demonstrates in a project both aesthetics principles in buildings and bridges, and unified roots of Architectural and Structural engineering. The award will alternate between Architecture and Civil Engineering. Selection will be carried out by the Scholarships and Awards Committee of the Faculty of Engineering on the recommendation of one Professor of Structural Engineering, one Professor of Architecture, one Consulting Structural Engineer, and one Consulting Architect. Application Deadline: Architecture - determined by Faculty; Engineering - March 31.

The APENS Award

The Association of Professional Engineers of Nova Scotia provides an award which is made at Convocation 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 candidates will be nominated by students of the graduating classes in consultation with their Engineering Department members. The award will consist of an engraved certificate and the sum of \$660.

Atlantic Farm Mechanization Show Award

The Atlantic Farm Mechanization Show Award is given annually to the student graduating in Agricultural Engineering who has exhibited the greatest aptitude in the machinery related classes (with particular emphasis on their design project) and who has thus demonstrated the greatest potential for a career in power and machinery. Value: \$500.

The Atlantic Industrial Engineering Society Prize

The Atlantic Industrial Engineering Society provides a prize which is awarded at Convocation each year to the student graduating in Industrial Engineering with the highest overall average in the programme of studies at DalTech.

APENS Environment Award

The Association of Professional Engineers of Nova Scotia (APENS) provides an award which is presented each year to the student(s), graduating from an undergraduate engineering programme, whose thesis/major project demonstrates a solution to an environmental problem. The award candidates will be nominated by each undergraduate Engineering Department with the final selection being made by APENS. The award will consist of an engraved certificate.

The Canadian Society for Chemical Engineering Medal

The Canadian Society for Chemical Engineering Medal is presented annually to the Junior Year student in Chemical Engineering with the highest overall average during the Junior Year of studies at DalTech.

Class of '85 Award

The Class of '85 Award is presented annually at Convocation to the student graduating in Agricultural Engineering who has exhibited the most outstanding qualities of scholarship, leadership, and personality during his/her course of studies at DalTech.

The Dean Flynn Memorial Prize

The Dean Flynn Memorial Prize is awarded annually to the student graduating in Mining Engineering with the highest overall average in the programme of studies at DalTech. The award has a value of \$50.

IEEE Medal

The Institution of Electrical and Electronics Engineers, Canadian Atlantic Section, provides a silver medal which is awarded at Convocation each year to the student graduating in Electrical Engineering with the highest overall average in the programme of studies at DalTech.

The Charles F.H. Macdonald Memorial Prize

The family of the late Charles F.H. Macdonald provided for a prize in his memory to be awarded each year to a student completing the penultimate year of the Bachelor of Engineering programme in Civil Engineering with a good academic average. The Prize is awarded by the Scholarships and Awards Committee on the recommendation of the Department of Civil Engineering. The award has a value of \$300.

The Ira P. MacNab Prize

The late Dr. Ira P. MacNab, an alumnus of the University, provided funds for an annual award to be presented to the student graduating in Mechanical Engineering with the highest overall average in a programme of studies at DalTech. The award has a value of \$75.

The Mining Society of Nova Scotia Centennial Scholarship Medal

The Mining Society of Nova Scotia Centennial Scholarship Medal will be awarded annually to a Mining or Metallurgical Engineering

student graduating at DalTech who demonstrates the best all-round merit in the course of studies at DalTech. Selection of the recipient is to be made at the discretion of the Department Head.

The Society of Chemical Industry Merit Award

The Society of Chemical Industry Merit Award is presented annually to the student graduating in Chemical Engineering with the highest overall average during the Senior Year of a programme of studies at DalTech. The Award consists of a gold key bearing the crest of the society, and a year's subscription to Chemical Engineering.

The William Stairs Memorial Prize

The William Stairs Memorial Prize is presented annually to the student who shows outstanding ability in metallurgy, physical properties of metals or the use of metals in the arts of industry. The award has a value of \$30.

The Louie I. Baker Awards in Technical Communication

Established by Dr. Max L. Baker in memory of his wife Louie are two prizes for the Technical Writing Category valued at \$300, and \$200, each, and two prizes for the Oral Presentation category valued at \$300, and \$200, each. Dr. Baker was Professor Emeritus at DalTech and a former Head of Mechanical Engineering. Competition is open to all DalTech students registered in Engineering. Oral Presentation - student registered in the final year. Technical Writing - students registered in the penultimate year. The recipients shall be selected in February of each year. The theme and rules governing the competition are available from the Office of the Associate Dean of Engineering. The details are published in the Guidelines for the Baker Awards. Application Deadline: December - Technical Writing; January - Oral Presentation

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 class in consultation with the Engineering Faculty members. The award will consist of a cash prize, as well as, 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 for promotion from Year II to Year III in the Dalhousie Faculty of 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 Bachelor 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 enrolls in the second year of the Bachelor 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.

The Dr. H.R. Theakston Memorial Award

This non-monetary award is presented each year to the student who achieves the highest standing in Engineering Graphics. It was established in 1964 in remembrance of Dr. H.R. Theakston who for several decades was University Engineer and Head of the Engineering Department, taught Graphics throughout that period and enjoyed a long and prestigious career as a professional engineer. The award consists of a certificate suitable for framing.

The Bob Walter Award

Given to the student who best combines fellowship, sportsmanship and scholarship, the Bob Walter Award is the highest honour which the Engineering Society can bestow upon its graduates. The award consists of an appropriate engraved gift and a certificate which is

suitable for framing. Instituted in the 1940/41 academic year, the award honours the memory of an outstanding engineering student who was president of the Dalhousie Engineering Society.

H. College of Arts and Science Awards

NOTE: 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 credits 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.

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.

(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.)

I. Faculty of Health Professions

1. College of Pharmacy

Altimed Pharmaceuticals Award

Two awards of \$500.00 each are available annually. The candidates must have attained a satisfactory academic standing in the first year classes and be registered in second year Pharmacy classes. The Selection Committee may consider financial need in determining the awardees.

The Apotex Inc./PACE Future Leader Award

Two awards of \$750 each are available annually to qualifying students who are graduating from the programme. The recipients will be selected from among those who have made significant contributions to the student body, who have demonstrated the strong potential to make contributions to the profession, and who have maintained throughout their university studies a satisfactory academic standing.

BMS Pharmacy Award

This award of \$500 is presented annually to the student with the highest standing in second-year classes.

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.

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 therapeutics class. The student must have an aptitude for clinical pharmacy practice and must have achieved a high level of performance during the clinical clerkship.

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.

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.

Jean Coutu Award

This \$3,000 award was introduced in 1996 by Jean Coutu to recognise a graduating New Brunswick Pharmacy student. The candidate must have attained good academic standing and have contributed to undergraduate and community life.

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 \$3,500.00.

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.

Robert C. Dickson 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. Dickson.

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 3.00.

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 4900.03B.

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 Charles E. Frosst Award

This award of \$1000 is presented by Merck Frosst Canada Inc. to an undergraduate student of outstanding merit in the third-year class.

The Charles E. Frosst Medal

This medal is presented by Merck Frosst Canada Inc. to the student who achieves the highest academic standing in the third-year class.

Hoechst-Marion-Roussel 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 Human Physiology 1400.06.

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 Killorn family and the pharmaceutical industry, demonstrates strong leadership skills and excels in academic and extracurricular 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 and in the fourth year dispensing laboratory class. It is desirable that the recipients demonstrate an interest in hospital pharmacy practice.

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.

Medis 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 third 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.

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.

Novartis Prize in Pharmacy

This prize is presented annually to the graduating student who obtains the highest standing in fourth year pathophysiology and therapeutics class (PHAR 4500.13). The prize consists of an engraved plaque, a cheque for \$250 and a reference book.

Novopharm Pharmaceuticals 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 Parke-Davis Prize

A prize of \$500 is presented annually to the student with the highest standing in the first-year classes of the pharmacy course.

Perrigo Award

This award is given annually to recognize a second year student who excels in the area of OTC counselling. The award, consisting of \$200 and a wall plaque, will be given to the top student in the OTC patient counselling role play portion of Pharmacy 2510.06: Therapeutics I.

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.

Roche Award

An annual award of \$750 is available to a pharmacy student in any year of study who has achieved satisfactory academic standing, has shown aptitude for the profession, and who may have financial need.

John J. Ryan Pharmacy Administration Award

This award of \$500 and a suitable memento is presented annually to the student earning the highest mark in Pharmacy 4700.03. This award was made possible through income from the John J. Ryan Fund.

The Leigh Semple Memorial Award

An endowment has been established to provide an annual award to a third-year pharmacy student from Prince Edward Island who has demonstrated strong academic ability and involvement in student activities.

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 ANAT 1010.03 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.

Pharmacy's Canada Centennial Award (External)

This award, presented jointly by the Canadian Pharmacists Association (CPhA), Apotex-PACE, and Pharmasave National, enables a Third year student to join pharmacists and fellow students at the Annual General Meeting of the Canadian Pharmaceutical Association. Additionally, the award programme exposes student winners to several facets of the profession including the pharmaceutical industry, innovative pharmacy practice sites, hospitals and government agencies wherever possible. Selection of the Centennial Scholar is based on academic achievement and outstanding contributions to undergraduate activities.

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.

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 class work related to over-the-counter drug products.

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 4000.06R, 4010.03A, 4020.03A or B, or 4030.03R, 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.

2. School of Nursing

Alumnae Award (Nursing)

This award is open to graduating students in the Basic or Post-RN programmes. The recipient will have achieved a Grade Point Average of 3.00 or better and have demonstrated clinical competency in the area of medical/surgical nursing in a hospital setting.

The Central Region Public Health Nursing Award

This award is open to the student who, during her/his clinical placement with the Central Region of Public Health Services, has demonstrated exceptional ability and skill in Community Nursing.

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.)

Dr. H.D. Fraser-Davey Book Award

This award is open to graduating students from either the Post-RN or the Basic programme in Nursing. Candidates will have indicated by her/his actions an interest in the health care needs of those living outside of North America, or has worked in midwifery nursing or can provide evidence of enrolment in a midwifery class and/or is participating in midwifery projects at the regional or national level. Candidates are to be nominated by faculty who are knowledgeable of the student's fulfilment of the criteria for the award.

The Grace Maternity Medical Staff Association Award for Excellence in Maternal Nursing

Open to graduates from the Basic programme, the recipient of this award will be one who demonstrates excellence in the area of maternal nursing as determined by the faculty member teaching the NURS 3210.04 class or its equivalent.

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 pediatric sector of the community.

Elizabeth MacK. Lambie Nutrition Award

The Elizabeth MacKinnon Lambie Nutrition Award has been set up to provide an award which is open to a graduating student from either the Post-RN or Basic stream in Nursing who has demonstrated the application of knowledge of community nutrition as it relates to Nursing.

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.

The Ruth May Award

This prize was established by graduates and friends of the Outpost Nursing Programme to honour the achievements of Ruth May, one of the founders of the Outpost Nursing Programme. At the request of Ruth May, this prize is to be awarded annually to the graduating Outpost Nursing student who has demonstrated significant professional development and personal growth while enrolled in the programme.

C.V. Mosby Book Prize

This award is given in recognition of a student's high academic standing and participation in the School.

Annä Trenholm Memorial Prize

A cash award has been donated by the family of the late Anna Trenholm (Diploma in Outpost Nursing, 1970; BN 1976). 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 ANAT 1010.03 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 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.

3. School of Occupational Therapy

a) For Graduating Students

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.

Class of '85 Award

This prize is awarded 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.

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 programme.

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.

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.

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.

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 programme.

Nova Scotia Association 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 (OCCU 3305.02, 3306.02, 3307.04 and 3308.03).

Newfoundland and Labrador Occupational Therapy Board Prize

An annual prize is open to the graduating student with the highest academic standing in the final year of the Occupational Therapy programme.

PEIOTS and PELIOT Award for Community Occupational Therapy

This prize is awarded annually to the graduating student with outstanding academic achievement in Advanced Professional Practice (OCCU 4419.06) as well as an interest and involvement in community practice.

The Sammons Award

This prize is awarded annually to the graduating student with the highest overall standing in statistics (MATH 1060.03); research methods (OCCU 4407.03) and Independent Study (OCCU 4421.06). 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 his/her independent research project.

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.

Smith & Nephew Award

This \$500 annual award is open to graduating students who have by their innovative and creative contributions shown promise for the profession and who have demonstrated academic performance. Fourth-year students who by the end of their third-year have a cumulative GPA of not less than 3.3 are invited to submit by April 15 a summary of their contributions to the advancement of occupational therapy to the Chair of the Student Awards Committee.

University Medal in Occupational Therapy

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

Williams and Wilkins Book Prize

This prize is awarded annually to the student entering fourth year with the highest cumulative academic standing.

b) For Other Students

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 classes dealing with psychiatry and mental health (OCCU 3302.05 and 3307.04).

The Norma Cassidy Prize

This award is presented annually to a student entering fourth year with the highest academic standing in Therapeutic Procedures (Rehabilitative, OCCU 3306.02).

T.B. Clift Ltd./NLAOT Academic Achievement Prize

This prize is presented annually to the student entering Third Year who is a Newfoundland resident with the highest GPA in the second year of study.

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.

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.

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 OCCU 2210.03 (Kinesiology).

4. School of Physiotherapy

a) 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 cumulative GPA in academic and clinical physiotherapy subjects during the entire programme.

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 grade in the Gerontology and Geriatrics component of the fourth year class.

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 Physiotherapy Association Prize

This prize is awarded to the member of the graduating class who has attained the highest standing in the year 3 neurology class. It is sponsored by the Newfoundland and Labrador Physiotherapy Association.

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 student with the highest standing in the year 4 neurology class. The recipient will be selected by the Dalhousie Professor who is managing the neurology class.

NSCPA, Orthopaedic Division Award

Established by the Nova Scotia Section of the Canadian Physiotherapy Association, an annual award is available to a graduating physiotherapy student. The awardee will be that graduating student who attains the highest combined grade from the orthopaedic/musculoskeletal classes in Years III and IV in the physiotherapy programme.

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.

b) Third Year

Canadian Physiotherapy Cardiorespiratory Society Book Prize

This prize is awarded annually to the Physiotherapy student who has attained the highest standing in the Cardiorespiratory in the Third Year.

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.

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 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.

c) 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.

5. School of Health and Human Performance

Charles Ballam Award

Honouring Professor Ballam for his keen interest in leadership development among students, this award is open to graduates of the Bachelor of Recreation programme. Nominations may come from individuals or organizations and are to be accompanied with supporting documentation concerning the nominee's demonstrated exemplary leadership in the recreation/leisure profession. Nominations and documents are to be submitted to the Director of the School.

Anthea 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 classes. 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 Society for Exercise Physiology

The Society 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. Ellis 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 graduand 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 Science (Recreation) programme. The recipient will have attained a cumulative Grade Point Average of 3.00 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 Health and Human Performance. 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.

John C. Pooley Sportsperson Award

This award is presented to the student who has contributed significantly to the development of a sport.

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 Health and Human Performance

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 H&HP Medals

Four awards are available to students in the School of Health and Human Performance. 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.

6. Maritime School of Social Work

The MSSW Alumni Award

Students who are expecting to be graduated in May or October of the current calendar year may be nominated for the award. Details for the nomination process are available from the School.

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.

J. 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 Lockie 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.

The D.C. MacKay Award in Money Management

An endowment has been established by Dr. Douglas C. MacKay, a successful investment banker, valued alumnus and active member of the School of Business Administration Advisory Committee. A major prize is available to a student whose programme concentration is Finance, whose career preparation is Money Management, who achieves excellent performance in COMM 3206 and who achieves satisfactory performance in research in the Money Management area.

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.

V. Financial Aid and Loans

A. Government Student Loans

IMPORTANT: Please note that federal and provincial student loan regulations include stipulations for the Borrower in terms of the minimum class load, expressed as a percentage of the normal class load at the University, which the Borrower must carry in order to benefit from the programme. Furthermore, this minimum must be maintained throughout the academic year. By way of example, a student who wishes to receive either money or interest-free status under the Canada Student Loan Plan for the entire academic year must carry not fewer than 60 per cent of the normal class load (expressed in credit hours) for each term. At Dalhousie, the normal credit hour load for student loan purposes is 30. Thus, the Borrower must carry not fewer than 18 credit hours, distributed equally between the terms, i.e., 9. If your particular programme does not conform to this scheme, you should apply to Student Aid for funding for only that term in which your class load would fulfil this regulation. Your attention is drawn to the fact that federal and provincial rules can differ on this matter. If you must drop classes or drop/add classes, exercise care so as not to jeopardize your governmental student loan(s).

B. 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
Fax: (403) 422-4516

British Columbia

Student Services Branch
Ministry of Advanced Education, Training and Technology
2nd Floor, 1106 Cook Street
Victoria, British Columbia V8V 3Z9
(604) 387-6100/6101
fax: (604) 356-9455

Manitoba

Student Financial Assistance Branch
Manitoba Education and Training
Box 6, 693 Taylor Avenue
Winnipeg, Manitoba R3M 3T9
(204) 945-6321/6322
fax: (204) 477-4596

New Brunswick

Student Services Branch
Department of Advanced Education and Training
P.O. Box 6000
Fredericton, New Brunswick E3B 5H1
(506) 453-2577
1-800-667-5625
(Atlantic Provinces, Ontario and Québec only)
fax: (506) 444-4333

Newfoundland

Department of Education
Student Aid Division
Thompson Student Centre
Memorial University of Nfld.
St. John's, Newfoundland A1C 5S7
(709) 729-4235/5849
fax: (709) 729-2298

Northwest Territories

Manager-Student Services
Department of Education
Government of the Northwest Territories
Yellowknife, Northwest Territories X1A 2L9
(403) 873-7190
or
1-800-661-0793
fax: 1-800-661-0893

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 (metro)
1-800-565-8420 (within province)
Fax: (902) 424-0540

(Street location: Trade Mart Building 2021 Brunswick at Cogswell
Streets Halifax, N.S.)

Ontario

Student Support Branch
Ministry of Colleges and Universities
P.O. Box 4500
Thunder Bay, Ontario P7B 6G9
(807) 343-7260
fax: (807) 343-7278

Prince Edward Island

Student Aid Office
Department of Education & Human Resources
P.O. Box 2000
Charlottetown, Prince Edward Island C1A 7N8
(902) 368-4640
fax: (902) 368-4663

Saskatchewan

Student Financial Assistance Branch Saskatchewan Education
1855 Victoria Avenue
Regina, Saskatchewan S4P 3V5
(306) 787-5620
fax: (306) 787-7537

Yukon Territory

Students' Financial Services
Department of Education
P.O. Box 2703
Whitehorse, Yukon Territory Y1A 2C6
(403) 667-5310 or (403) 667-5929
fax: (403) 667-6339

The above authorities also administer provincial bursary and loan plans in conjunction with the Canada Student Loan, if applicable.

Québec

Residents of Québec 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) 646-5245

Leave brief message, your name, your Code Permanent, and the day/time period you will be "home". Québec will telephone the student back at that time period.
(514) 864-4505 (24-hour automated service)
fax: (418) 528-0648

C. Short-Term Loans

1. For all Dalhousie Students

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. Students must provide at the time of application documentary proof of their ability to repay the loan within the time period. (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.

2. 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 OCCU 4420; the second priority is for Fourth-Year students who are about to undertake fieldwork OCCU 4421. 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 Registrar's Office - Awards or the School of Occupational Therapy.

3. For DalTech Students

Student's Medical Response Trust Fund

The fund was established with a generous donation from Professor and Mrs. Surain S. Sarwal, a member of DalTech Faculty along with Students, Staff, Faculty and Friends of DalTech.

The concept of the fund was developed in response to a medical emergency. Prior to the establishment of this Fund, Students, Staff, Faculty and Friends of DalTech joined together to provide special funding to assist a student.

A committee will decide upon the distribution of funds. This committee will consist of the President of the Student Union, Dean of Students, Co-ordinator of International Students, presidents of all "A" societies (including the Engineering Undergraduate Society, the Graduate Student Society, the Architecture Student association, and the Computer Science Society).

Distribution of funding will be subject to the judgement of the committee taking into account the individual circumstances and needs.

VI. Dalhousie Bursaries

The University's bursary programme is intended as possible supplementary assistance to help qualifying students with a portion of their strict educational costs.

General Intent of University Bursaries

The University has funds at its disposal for the purpose of assisting those of its students who may face certain types of financial situations. While these bursaries are awarded primarily on the basis of demonstrable need as determined by the appropriate University office or committee, satisfactory academic standing (see as defined in Academic Regulations) is also expected. Students whose financial needs are exceptionally large and/or students whose academic standing is unsatisfactory may not be assisted. Normally, bursaries will be awarded only to students who have availed themselves of assistance under the Canada Student Loan Programme and/or corresponding provincial or territorial loan and/or bursary programmes. Normally, receipt of the first installment of such funding is a prerequisite to the University's consideration of an application for bursary assistance.

A. Architecture, Faculty of

Unless otherwise noted, selection for these bursaries is made by the Undergraduate Awards and Scholarships Committee of the Faculty of Engineering augmented by representatives of the Faculty of Architecture. Application forms are available from the Offices of the Deans of Engineering or Architecture. Application deadline is September 30.

The Birks Family Foundation Bursary Plan for Architecture and Engineering

The Birks Family Foundation established a bursary of \$500 to be awarded on the basis of financial need, provided that the registered Architecture or Engineering student is maintaining an acceptable academic standard. Application deadline: September 30.

The Michael G. Johnston Memorial Entrance Bursary

This annual \$500 bursary has been established in the memory of Michael G. Johnston by the Board of Governors of the University. Michael G. Johnston was a valued member of the DalTech Board of Governors who expressed sincere interest in all who came into contact with him. Candidates must have fulfilled or expect to fulfil the minimal entrance requirements for an undergraduate programme in Architecture, or for entrance into the third year of Computer Science and Engineering. The bursary is awarded on the basis of community involvement, scholastic ability, and financial need. Application deadline: April 30.

The Rod Shoveller Memorial Bursary

The bursary has been established by the Student Union of DalTech and is supported by students, alumni, family, friends and colleagues. Mr. Shoveller was the Athletic Director of DalTech from 1980 to 1991 and acted as counsellor, mentor, and friend to hundreds of students who came to know his compassion and understanding. The award of \$500 is made to a student who is maintaining an acceptable academic standard in the penultimate term of study in any faculty at DalTech. Award is made on the basis of participation in DalTech athletics, with an emphasis on intramurals and financial need. Selection is carried out by the Scholarships & Awards Committee of the Faculty of Engineering. Application deadline: September 30.

B. Arts & Science

Specified as to Year

a) 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.

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.

b) Fourth Year

Professor 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.

2. Unspecified as to Year

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 First Nations, but where no such persons apply, the bursaries are to be given to other applicants as determined by the appropriate office of the University.

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 Registrar's Office - Awards 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 Lt.(E) Harry J. Brewer, MBE, CD, RCN (Ret.), Memorial Bursary

A memorial bursary fund has been established to provide financial assistance to a full-time student who is enrolled in a degree or diploma programme. The recipient(s) will have demonstrated financial need and satisfactory academic standing as defined in academic regulations.

The Robert Bruce Bursaries

Several bursaries tenable in the third year of an Arts or Science class, 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, if money remains after scholarship expenditures.

Dalhousie Science Society Bursary

The Dalhousie Science Society provides \$1,500 to support three bursaries of \$500 each to students who are enrolled in Year III or IV of a programme leading to a Bachelor of Science degree. Recipients will have demonstrated financial need, satisfactory academic standing, and involvement in extracurricular activities at the University. This bursary requires a separate application form; however, applicant may use the regular University Bursary Application with which they should include a letter wherein pertinent information of extracurricular activity is clearly stated. Applicants must have achieved eight Whole Class Equivalents at

Dalhousie. The deadline for receipt of applications is 30th November. Please note that a separate application specifically for this award is necessary.

Audrey-Lea Dawson Memorial Bursary

A memorial bursary is open annually to one or more female students enrolled in the Bachelor of Science programme who have demonstrated financial need and satisfactory academic standing.

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. Please apply to the Department of Biology.

Allan Chaloner Hill Bursary

The Allan Chaloner Hill Bursary endowment was established by his daughter Alison Biedermann-Hill in her father's memory. A bursary is available to a second- or third-year chemistry student. Please apply to the Department of Chemistry.

Wilfred E. Hillis Bursary

The late Mrs. Olga Munro Hillis made provision for the establishment of the Wilfred E. Hillis 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.

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 Registrar's Office - Awards.

C. Computer Science

Unless otherwise noted, selection for these bursaries is made by the Undergraduate Awards and Scholarships Committee of the Faculty of Engineering augmented by representatives of the Faculty of Computer Science. Application forms are available from the Offices of the Deans of Engineering or Computer Science. Application deadline is September 30.

The Michael G. Johnston Memorial Entrance Bursary

This annual \$500 bursary has been established in the memory of Michael G. Johnston by the Board of Governors of the University. Michael G. Johnston was a valued member of the DalTech Board of Governors who expressed sincere interest in all who came into contact with him. Candidates must have fulfilled or expect to fulfil the minimal entrance requirements for an undergraduate programme in Architecture, or for entrance into the third year of Computer Science and Engineering. The bursary is awarded on the basis of community involvement, scholastic ability, and financial need. Application deadline: April 30.

The Rod Shoveller Memorial Bursary

The bursary has been established by the Student Union of DalTech and is supported by students, alumni, family, friends and colleagues. Mr. Shoveller was the Athletic Director of DalTech from 1980 to 1991 and acted as counsellor, mentor, and friend to hundreds of students who came to know his compassion and understanding. The award of \$500 is made to a student who is maintaining an acceptable academic standard in the penultimate

term of study in any faculty. Award is made on the basis of participation in DalTech athletics, with an emphasis on intramurals and financial need. Selection is carried out by the Scholarships & Awards Committee of the Faculty of Engineering. Application deadline: September 30.

D. Engineering

1. Studley Campus

J. Winston MacDonald Bursary

An endowment has been established to provide an annual bursary to a student enrolled in the Engineering programme at Dalhousie University. The recipient will have demonstrated financial need and satisfactory academic standing. The bursary is given in memory of John Winston MacDonald who was graduated from Dalhousie University in 1929 with a Bachelor of Science degree and the Diploma in Engineering, and from the Nova Scotia Technical College in 1931. Apply through the Registrar's Office using a separate application form, specifically annotated for this.

Susan (Cox) Wickwire Bursary in Engineering

An endowment has been established in memory of Susan (Cox) Wickwire, a former school teacher whose four sons are University alumni. The bursary is open to students for promotion from Year II to Year III in the Dalhousie Faculty of Engineering. The recipient will have demonstrated financial need and satisfactory academic standing. Apply through the Faculty of Engineering, Studley Campus Office.

2. Sexton Campus

Unless otherwise noted, selection of bursary awardees is carried out by the Scholarships and Awards Committee of the faculty of Engineering. Application forms are available from the Office of the Associate Dean of Engineering.

Birks Family Foundation Bursary Plan for Architecture and Engineering

The Birks Family Foundation established this bursary, valued at \$500. Eligible students are to be registered in the Architecture or Engineering programs. The award is made on the basis of financial need, provided that the applicant is maintaining an acceptable academic standard. Application deadline: September 30.

The Emily E. Brown Bursary

The Women's Auxiliary of the Mining Society of Nova Scotia established this award of \$200. Eligible students are to be registered in the Junior Year of Mining and Metallurgical Engineering. The award will be granted on the basis of academic standing and financial need, with preference given to students born in the Atlantic Provinces who have attended one of the Associated Universities. Selection is carried out by the Women's Auxiliary of the Mining Society of Nova Scotia. Applicants apply to the Head of Department of Mining and Metallurgical Engineering. Application Deadline: September 30.

The John J. Jodrey Entrance Bursary

John J. Jodrey established two awards of \$500 each. Eligible candidates must have fulfilled or expect to fulfil the minimum requirement for entrance into the third year of an undergraduate programme in the Faculty of Engineering. This award is restricted to Atlantic Canadians. Application deadline: April 30.

The Michael G. Johnston Memorial Entrance Bursary

This annual \$500 bursary has been established in the memory of Michael G. Johnston by the Board of Governors of the University. Michael G. Johnston was a valued member of the DalTech Board of Governors who expressed sincere interest in all who came into contact with him. Candidates must have fulfilled or expect to fulfil the minimal entrance requirements for an undergraduate programme in Architecture, or for entrance into the third year of Computer Science and Engineering. The bursary is awarded on the basis of community involvement, scholastic ability, and financial need. Application deadline: April 30.

The Jason Paquet Memorial Bursary

This bursary, valued at \$500 has been established in memory of Jason Paquet by his family, friends, fellow students, faculty and

alumni of mechanical engineering. Mr. Paquet was registered as a fourth year mechanical engineering student at the time of his death. Eligible students are to be registered in the Junior Year of the Mechanical Engineering programme of the Faculty of Engineering. The award is based primarily on financial need. The committee will also consider the academic record of the applicant and involvement in sports and community. Preference will be given to students who were residents of Prince Edward Island prior to attending DalTech. Application deadline: September 30.

Wade Gates Memorial Bursary

This bursary of \$500 has been established in memory of Wade Gates by colleagues, family and friends. Mr. Gates was a technologist in the Department of Chemical Engineering at DalTech for many years. Eligible students are to be registered in Year 4 or 5 of an undergraduate engineering programme with preference given to Chemical Engineering students. The award is based primarily on financial need but the Committee also considers the academic record of the applicant. Application deadline: September 30.

Mining Engineering Bursary

Mining Engineering Graduates of DalTech have established this bursary of \$200. Eligible students are to be registered in the Junior or Senior Year of the Mining Engineering programme of the B.Eng. The applicant must be maintaining a passing average. The award is made on the basis of financial need. Although extenuating circumstances will be considered, a statement of net earnings from the applicant's summer employer will be required. Application deadline: September 30.

N.S. Road Builders Association Bursary

The N.S. Road Builders Association established this award of \$1,000. Eligible students are to be registered in the Senior Year in the Faculty of Engineering. The Committee will consider the applicant's financial need, academic standing, interest in highway or construction engineering, and executive ability in a construction company or highway department. Preference will be given to students registered in Civil Engineering. Application deadline: September 30.

The Rod Shoveller Memorial Bursary

This \$500 bursary has been established by the Student Union of DalTech and is supported by students, alumni, family, friends and colleagues. Mr. Shoveller was the Athletic Director of DalTech from 1980 to 1991 and acted as counsellor, mentor and friend to the hundreds of students who came to know his compassion and understanding. Eligible students are entering their penultimate term of study in any DalTech faculty. The award is made on the basis of participation in DalTech athletics, with an emphasis on intramurals and financial need, provided that the applicant is maintaining an acceptable academic standard. Selection is carried out by the Scholarships & Awards Committee of the Faculty of Engineering. Application deadline: September 30.

3M Canada Inc. Entrance Bursary in Engineering

3M Canada Inc. established this award of \$500. Eligible candidates must have fulfilled or expect to fulfil the minimum requirements for entrance into third year of an engineering undergraduate programme in the Faculty of Engineering. The Committee will also weigh financial and other considerations in reaching a decision. Application deadline: April 30.

The Dr. H.G. Sherwood Memorial Entrance Bursary

This \$300 bursary has been established in memory of Dr. H.G. Sherwood by former employers, friends and colleagues. Dr. Sherwood was a dedicated professor in the Mining Engineering programme at DalTech for many years. Eligible candidates must have fulfilled or expect to fulfil the minimum entrance requirements into year three of the Mining Engineering undergraduate programme in the Faculty of Engineering. The Bursary is awarded on the basis of the applicant's academic record at an Associated University or in the previous years at Dalhousie. While academic excellence will be the primary criterion for the award, the selection committee may also weigh other considerations in reaching a decision. Application deadline: April 30.

E. Divinity Candidates

The Ross Millar Bursary

Under the will of Dr. Ross Millar 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 Registrar's Office - Awards, and the necessary scholastic requirements will be decided either at the matriculation examinations or by ability as shown by the sessional examinations.

F. Faculty of Health Professions

1. College of Pharmacy

PLEASE NOTE: The College administers the following bursaries. Applications are available directly from the College of Pharmacy and, upon completion, must be submitted thereto by 1st June.

Boehringer Ingelheim (Canada) Ltd. Pharmacy 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.

Jean Cousté Bursaries

Three bursaries of \$2,000 each are offered annually to students from New Brunswick who are completing the first, second and third years of the Pharmacy course. The students must have satisfactory academic standing and financial need.

The Jack Kidd/ANCA Bursary

This award was established (as a scholarship until 1986-87) in 1982 to recognise 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.

Lawtons Drugs 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.

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 \$500. The bursaries are awarded on the basis of need to those students whose academic achievement, promise, and character are acceptable.

Apotex Inc./P.A.C.E. 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.

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.

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.

2. School of Occupational Therapy

Phyllis Kennedy Memorial Bursaries

The 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 3.00 in each of the second and third years, and must demonstrate interest in their studies and the School. Apply to the School. NOTE: Students who need assistance with their fieldwork costs are referred to the entry on short-term loans.

3. School of Health and Human Performance

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 Health & Human Performance.

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. Contact the Registrar's Office.

4. Maritime School of Social Work

a) The following bursaries are administered by the Office of the Registrar.

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.

b) The following bursaries are administered by the School

The Maritime School of Social Work Alumni Bursary

This bursary was established at the time of Mary Lou Courtney's retirement as a tribute to her more than 30 years of devoted teaching and work on behalf of the School, the University and profession. The Alumni Bursary will be awarded annually to a BSW students who

demonstrates financial need and who best exemplifies the qualities of humanity, community and service which characterized Mary-Lou Courtney's work.

The Sonja R. Weil Memorial Bursary

Family and friends established this endowment as a memorial to Sonja Weil and in tribute to her work as a social worker and psychotherapist. This bursary is open to students in the MSW and BSW programmes who demonstrate financial need, satisfactory academic standing and interest in those areas which most closely reflect Sonja Weil's work in child and family therapy.

G. Faculty of Management

Bachelor of Commerce Programme

Knight, Bain, Seath, Holbrook Atlantic Limited 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. Apply through the School of Business Administration.

H. Unspecified or Selected Faculties

The following bursaries, unless indicated otherwise, are administered by the Office of the Registrar.

The Eva and David Ashkins 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 Registrar's Office - Awards 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. Similar bursaries are available at DalTech.

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. Submit completed forms to the Department of Athletics and Recreational Services, which will forward your application with supplementary information.

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 Annette S. Hill to set up a fund, the income therefrom to be used to assist needy students.

Annie E. Longard Memorial Bursary

An endowment has been established to provide an annual bursary in memory of an accomplished alumna and long-time participant in the Women's Division of the Dalhousie Alumni Association. The bursary is available to an undergraduate student at Dalhousie on the basis of demonstrated need and satisfactory academic standing.

The Neil 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. There are several sets of criteria. Refer to information flyer at the Information Centre, Room 133, A&A Building.

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 to assist an outstanding student in commerce or science. The bursary has been assigned to entrance. (This bursary is distinct from the DalTech one.)

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. 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.

VII. Study Work International Fund

Lester Pearson International (LPI) is responsible for Dalhousie's Study/Work International Fund (SWIF). This programme provides funding to students in financial need who wish to undertake an international placement as part of their academic programme. Funds are limited. It is important to file a clear, documented application by the deadline for consideration for a possible bursary. For more information and an application, contact Dalhousie's LPI, 494-2038.

VIII. 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 Registrar's Office - Awards. 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 Registrar's Office - Awards 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 Registrar's Office - 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. Please read the main section regarding the Dalhousie Bursary Programme. If you are enrolled in fewer than 18 credit hours of class work the section on governmental loans does not apply.

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.

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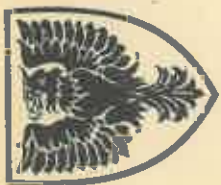
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U.S. GEOLOGICAL SURVEY

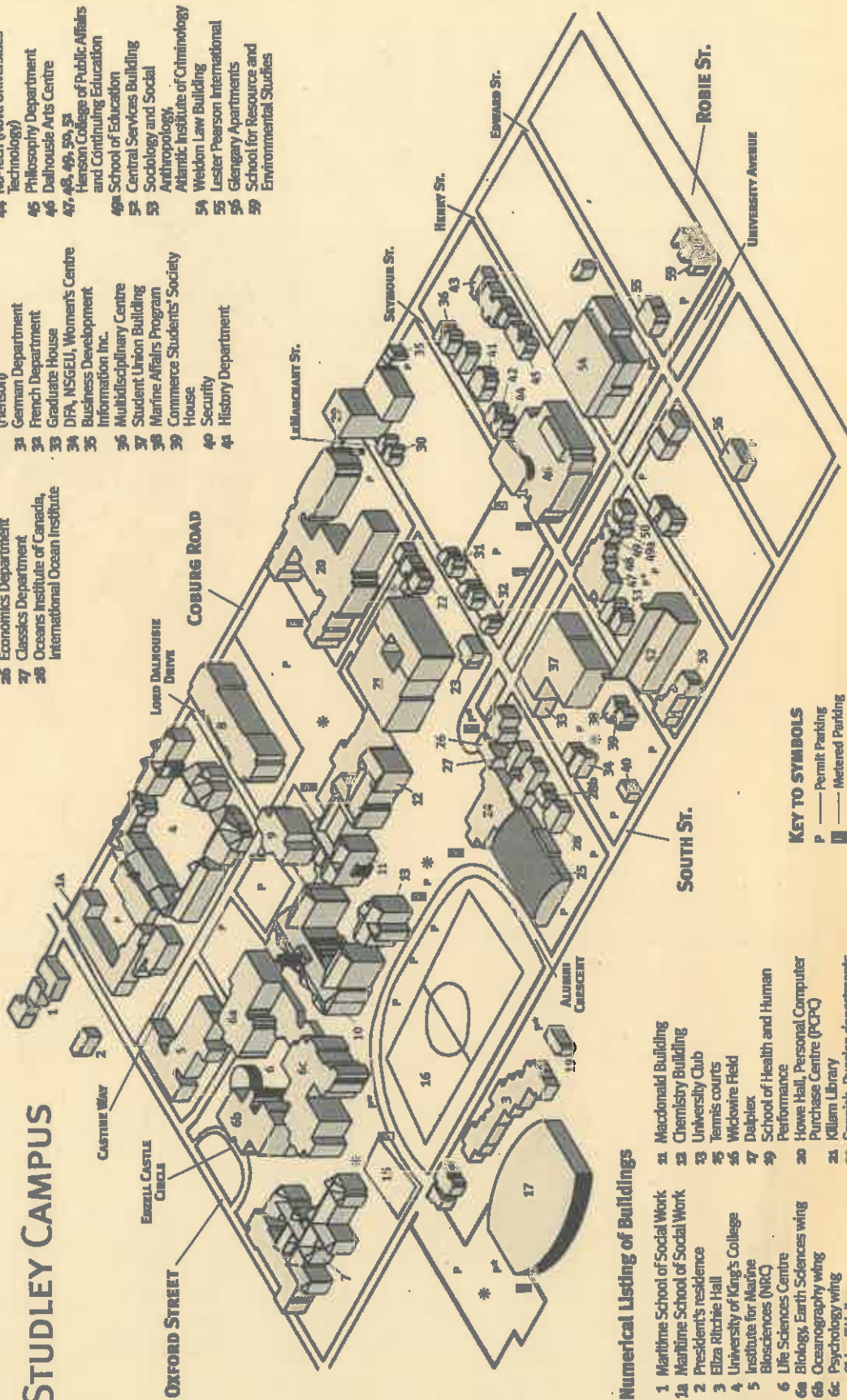


DEPARTMENT OF THE INTERIOR
BUREAU OF GEOLOGICAL SURVEY



DALHOUSIE University

STUDLEY CAMPUS



- 23 French, Comparative Religion departments
- 24 Studley Gymnasium
- 25 Dalhousie Memorial Arena (fink)
- 26 Economics Department
- 27 Classics Department
- 28 Oceans Institute of Canada, International Ocean Institute

- 28 Student Services Administration
- 29 School of Business Administration (Henson)
- 30 Transient Year Program
- 31 German Department
- 32 French Department
- 33 Graduate House
- 34 DFA, NSGEU, Women's Centre
- 35 Business Development Information Inc.
- 36 Multidisciplinary Centre
- 37 Student Union Building
- 38 Marine Affairs Program
- 39 Commerce Students' Society House
- 40 Security
- 41 History Department

- 42 English Department, Environmental Health and Safety, Radiation Safety
- 43 English Department
- 44 NU-Tech (Nova Universities Technology)
- 45 Philosophy Department
- 46 Dalhousie Arts Centre
- 47, 48, 49, 50, 51 Henson College of Public Affairs and Continuing Education
- 49 School of Education
- 52 Central Services Building
- 53 Sociology and Social Anthropology
- 54 Atlantic Institute of Criminology
- 55 Weikou Law Building
- 56 Lester Pearson International
- 58 Glengary Apartments
- 59 School for Resource and Environmental Studies

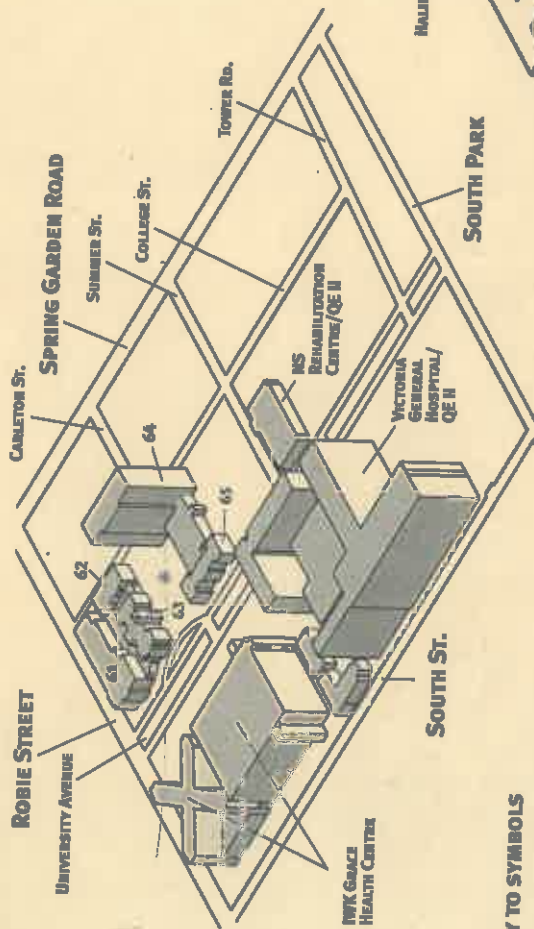
Numerical Listing of Buildings

- 1 Maritime School of Social Work
- 1a Maritime School of Social Work
- 2 President's residence
- 3 Eliza Ritchie Hall
- 4 University of King's College
- 5 Institute for Marine Biosciences (NRC)
- 6 Life Sciences Centre
- 6a Biology, Earth Sciences wing
- 6b Oceanography wing
- 6c Psychology wing
- 7 Shirreff Hall
- 8 St. James Dunn Science Building
- 9 Chase Building
- 10 Arts and Administration Building
- 11 Macdonald Building
- 12 Chemistry Building
- 13 University Club
- 15 Tennis courts
- 16 Wickwire Field
- 17 Dalplex
- 19 School of Health and Human Performance
- 20 Howe Hall, Personal Computer Purchase Centre (PCPC)
- 21 Kildam Library
- 22 Spanish, Russian departments

- ### KEY TO SYMBOLS
- P Permit Parking
 - P# Metered Parking
 - P# Parking for people with Disabilities
 - * Tiger Lights

CARLETON CAMPUS

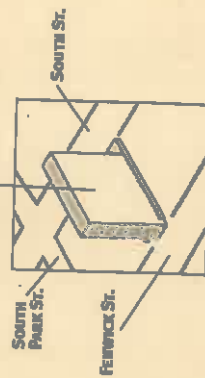
- 61 Dentistry Building
- 62 Burbidge Building
- 63 Forrest Building
- 64 Sir Charles Tupper Medical Building
- 65 Clinical Research Centre



KEY TO SYMBOLS

- P Permit Parking
- M Metered Parking
- Pd Parking for people with Disabilities
- * Tiger Lights

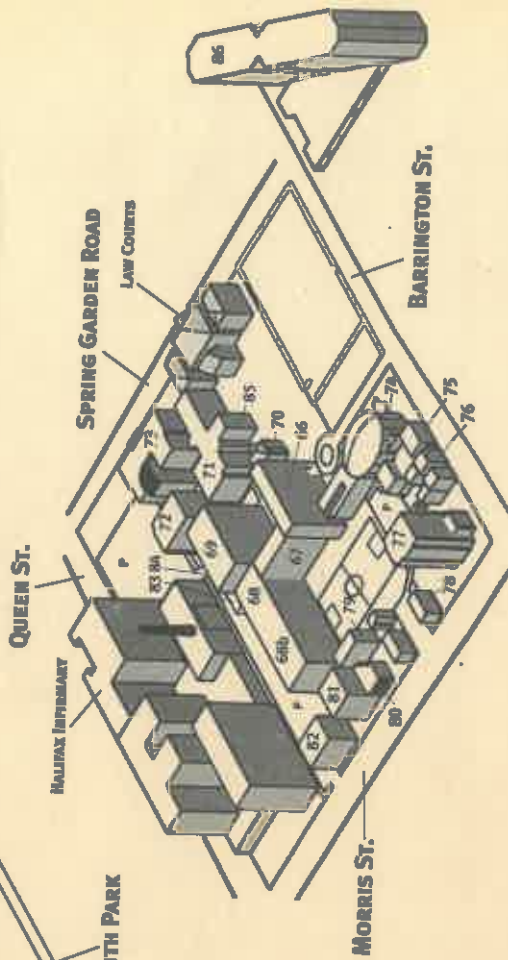
Fenwick Place off-campus student residence



SEXTON CAMPUS (DALTECH)

Sexton Campus houses DalTech. Many DalTech buildings are labelled both by name and letter (which appears in brackets in the listings where appropriate).

- 66 Ira Machab (A):
- 67 1360 Barrington (B):
- 68 Electrical Building (C)
- 69 H.R. Theakston (C)
- 69 A.L. MacDonald Building (D)
- 70 Sexton House (E)
- 71 "F" Building
- 72 G.H. Murray Building (G)
- 73 Faculty of Architecture (H)
- 74 F.H. Sexton Memorial Gymnasium (I)
- 75 Hart House (K)
- 76 University House (L)
- 77 M.J.M. O'Brien Hall (M)
- 78 Graduate Student Residence (O)
- 79 Dust Explosion Lab (T)
- 80 "R2" Building
- 84 "R1" Building
- 85 Morroy Building
- 85 B.J.L. Cain Building (O)
- 84 N Building
- 85 A.E. Cameron (P)
- 86 Maritime Centre



Note: maps are not drawn to the same scale



Table 1
Summary of
Key Findings
and
Recommendations

Table 2
Detailed
Analysis of
Key Findings

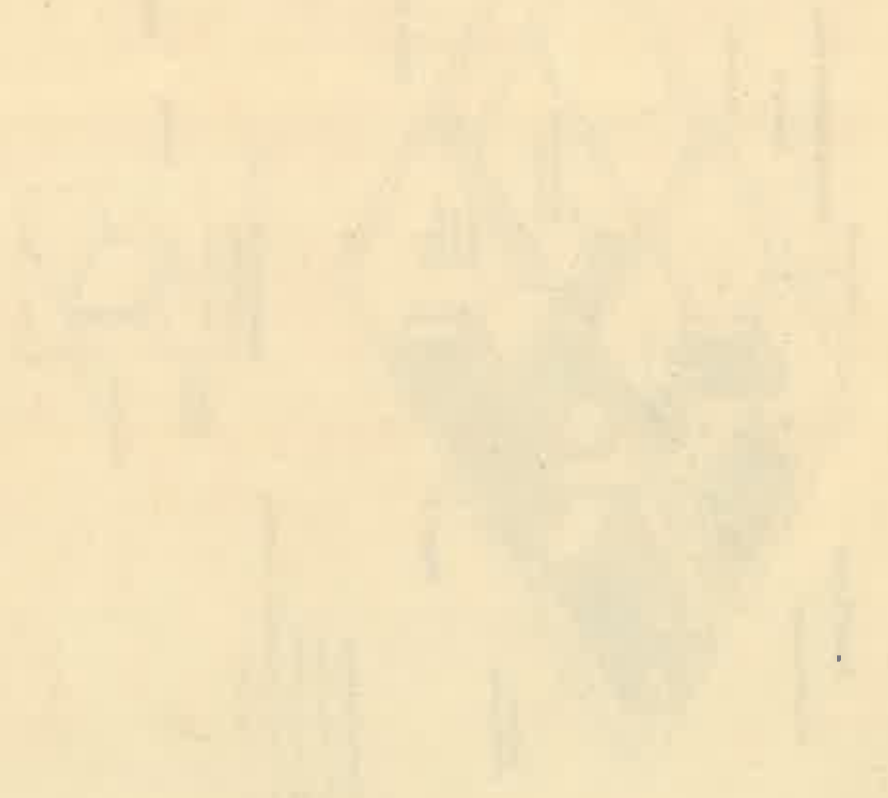


Table 3
Detailed
Analysis of
Key Findings

1998

JANUARY							FEBRUARY							MARCH							APRIL						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2	3	1	2	3	4	5	6	7	1	2	3	4	5	6	7				1	2	3	4
4	5	6	7	8	9	10	8	9	10	11	12	13	14	8	9	10	11	12	13	14	5	6	7	8	9	10	11
11	12	13	14	15	16	17	15	16	17	18	19	20	21	15	16	17	18	19	20	21	12	13	14	15	16	17	18
18	19	20	21	22	23	24	22	23	24	25	26	27	28	22	23	24	25	26	27	28	19	20	21	22	23	24	25
25	26	27	28	29	30	31								29	30	31					26	27	28	29	30		

MAY							JUNE							JULY							AUGUST						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2		1	2	3	4	5	6	1	2	3	4										1	
3	4	5	6	7	8	9	7	8	9	10	11	12	13	5	6	7	8	9	10	11	2	3	4	5	6	7	8
10	11	12	13	14	15	16	14	15	16	17	18	19	20	12	13	14	15	16	17	18	9	10	11	12	13	14	15
17	18	19	20	21	22	23	21	22	23	24	25	26	27	19	20	21	22	23	24	25	16	17	18	19	20	21	22
24	25	26	27	28	29	30	28	29	30					26	27	28	29	30	31	23	24	25	26	27	28	29	
31														30	31						30	31					

SEPTEMBER							OCTOBER							NOVEMBER							DECEMBER								
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S		
				1	2	3	4	5				1	2	3	1	2	3	4	5	6	7				1	2	3	4	5
6	7	8	9	10	11	12	4	5	6	7	8	9	10	8	9	10	11	12	13	14	6	7	8	9	10	11	12		
13	14	15	16	17	18	19	11	12	13	14	15	16	17	15	16	17	18	19	20	21	13	14	15	16	17	18	19		
20	21	22	23	24	25	26	18	19	20	21	22	23	24	22	23	24	25	26	27	28	20	21	22	23	24	25	26		
27	28	29	30				25	26	27	28	29	30	31	29	30						27	28	29	30	31				

1999

JANUARY							FEBRUARY							MARCH							APRIL						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2		1	2	3	4	5	6	1	2	3	4	5	6				1	2	3			
3	4	5	6	7	8	9	7	8	9	10	11	12	13	7	8	9	10	11	12	13	4	5	6	7	8	9	10
10	11	12	13	14	15	16	14	15	16	17	18	19	20	14	15	16	17	18	19	20	11	12	13	14	15	16	17
17	18	19	20	21	22	23	21	22	23	24	25	26	27	21	22	23	24	25	26	27	18	19	20	21	22	23	24
24	25	26	27	28	29	30	28							28	29	30	31				25	26	27	28	29	30	
31																											

MAY							JUNE							JULY							AUGUST						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1		1	2	3	4	5		1	2	3										1		
2	3	4	5	6	7	8	6	7	8	9	10	11	12	4	5	6	7	8	9	10	8	9	10	11	12	13	14
9	10	11	12	13	14	15	13	14	15	16	17	18	19	11	12	13	14	15	16	17	15	16	17	18	19	20	21
16	17	18	19	20	21	22	20	21	22	23	24	25	26	18	19	20	21	22	23	24	22	23	24	25	26	27	28
23	24	25	26	27	28	29	27	28	29	30				25	26	27	28	29	30	31	29	30	31				
30	31																										

SEPTEMBER							OCTOBER							NOVEMBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2	3	4				1	2		1	2	3	4	5	6				1	2	3	4	
5	6	7	8	9	10	11	3	4	5	6	7	8	9	7	8	9	10	11	12	13	5	6	7	8	9	10	11
12	13	14	15	16	17	18	10	11	12	13	14	15	16	14	15	16	17	18	19	20	12	13	14	15	16	17	18
19	20	21	22	23	24	25	17	18	19	20	21	22	23	21	22	23	24	25	26	27	19	20	21	22	23	24	25
26	27	28	29	30			24	25	26	27	28	29	30	28	29	30					26	27	28	29	30	31	
							31																				



FOR FURTHER INFORMATION

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