UNIVERSITY OF KING'S COLLEGE CALENDAR 1984-85

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1984-85

THE UNIVERSITY OF KING'S COLLEGE

Bachelor of Arts (Ordinary and Honours)
Bachelor of Science (Ordinary and Honours)
These degrees are granted by Dalhousie University.
Also in association with Dalhousie, King's offers the requisite pre-professional work for admission to **Medicine, Dentistry, Architecture, Law, Education, Physiotherapy, Theology.**

Bachelor of Journalism (Honours) (Four years from Grade 12)
Bachelor of Journalism (One year after a first degree)
These degrees are awarded by the University of King's College.

cover photograph: John F. Godfrey

CALENDAR
1984-85

University of King's College
FOUNDED A.D. 1789

HALIFAX, NOVA SCOTIA
196th SESSION

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NOTICE

All readers and prospective 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.

Any reference to courses or classes contained herein is a statement of courses or classes that have been taught at the University of King's College and Dalhousie University in the past. The University of King's College and Dalhousie University assume no obligation to continue to teach such courses or classes and prospective students are asked to consult with the respective Faculty to determine any changes to a course or class description contained herein.

The University of King's College reserves the right to delete, revise or add to anything described in this Calendar without notice, other than through the regular processes of the University of King's College and 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.

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

Inquiries regarding academic matters should be directed to:
The Registrar
University of King's College
Halifax, Nova Scotia
Canada
B3H 2A1

ALMANAC 1984-1985

JULY 1984

(Halifax Natal Day—no classes—date to be confirmed)

Sunday, 1
Dominion Day

Tuesday, 3
Summer School (2nd session) registration and classes begin

AUGUST 1984

(Dartmouth Natal Day - half holiday - date to be confirmed)

Wednesday, 15
Final day of classes, Summer School

Monday, 27
Registration and payment of fees, Bachelor of Journalism

Tuesday, 28
Classes begin in Bachelor of Journalism (B.J.) Programme

SEPTEMBER 1984

Monday, 3
Labour Day

Tuesday, 4
Supplemental examinations begin in Arts and Science

Wednesday, 5 - Saturday noon, 8
Last regular days for class approval, registration, and payment of fees for students in Arts and Science and Bachelor of Journalism (Honours) Programme

Thursday, 6
Classes begin in the Foundation Year Programme
University Church Service - Chapel 5:00 p.m.

Monday, 10
Classes begin in Arts and Science and Bachelor of Journalism (Honours) Programme

Friday, 21
Last day for adding classes (except "B" classes) Arts and Science and Journalism

OCTOBER 1984

Monday, 8
Thanksgiving Day

NOVEMBER 1984

Sunday, 11
Remembrance Day

Monday, 12
Last day for withdrawing from "A" classes without academic penalty, Arts and Science and Journalism

DECEMBER 1984

Thursday, 6
Last day of classes in Arts and Science, Foundation Year Programme and Journalism

Friday, 7
Examinations begin in Arts and Science and Journalism

Monday, 17
No classes, student holidays begin

Tuesday, 25
Christmas Day

Wednesday, 26
Boxing Day

JANUARY 1985

Tuesday, 1
New Year's Day

Wednesday, 3
Registration of new students
Classes resume, all faculties

Friday, 11
Last day for adding "B" (or second term) classes, Arts and Science and Journalism

Wednesday, 23
Last day for withdrawing from full-year classes, without academic penalty, Arts and Science and Journalism

FEBRUARY 1985

Friday, 1
George III Day. No classes

Saturday, 2
Winter Carnival. No classes

Monday, 25
Study break begins

MARCH 1985

Monday, 4
Classes resume

Friday, 8
Last day for withdrawing from "B" classes without academic penalty, Arts and Science and Journalism

Friday 29
Awards Banquet

APRIL 1985

Thursday, 4
Last day of classes, Foundation Year Program

Friday, 5
Good Friday

Saturday, 6
Last day of classes in Arts and Science and Journalism

Monday, 8
Examinations begin in Arts and Science and Journalism

Thursday, 18
Last day for submitting work in the Foundation Year Programme

MAY 1985

Wednesday, 8
Encaenia Day - 11:00 a.m. Baccalaureate Service
King's Convocation - 2:30 p.m.

Thursday, 9
Dalhousie University Convocation

Friday, 10
Dalhousie University Convocation

Monday, 13
Summer School registration and classes begin (1st session)

Monday, 20
Victoria Day

Friday, 24
Dalhousie University Convocation

JUNE 1985

Tuesday, 25
Summer School ends (1st session)

OFFICE HOURS
Week days (Monday - Friday) 9:00 a.m. - 5:00 p.m.
June, July, August (Monday - Friday) 9:00 a.m. - 4:30 p.m.

OFFICERS OF THE UNIVERSITY:

Patron
The Most Reverend the Lord Archbishop of Canterbury and Primate of All England

Visitor
The Right Reverend the Lord Bishop of Nova Scotia

Chancellor
The Honourable Mr. Justice R.A. Ritchie, B.A. (Vind et Oxon.), D.C.L. (Vind), LL.D.(Dal.)

President and Vice-Chancellor
John F. Godfrey, B.A. (Trin.), M.Phil., D.Phil. (Oxon.)

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The Very Rev. J. Austin Munroe, B.A., M.S.Litt., B.D., D.D.

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Ms. Mary Barker, B.A.
Mr. Avard L.J. Bishop, B.A., L.L.B.
Dr. John F.S. Crocker, M.D.
Mr. J. Mark DeWolf, M.A.
The Rev. R.E. Harris, B.A., B.D.
Ms. Susan E. Harris, B.A.
Mr. John Stone, B.A., M.A.

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Dr. George C.S. Bain, D.Litt.
The Rev. Dr. Wayne J. Hankey, B.A., M.A., D.Phil.
Dr. Colin J. Starnes, B.A., S.T.B., M.A., Ph.D.
Dr. K.E. von Maltzahn, M.S., Ph.D.

Student Union Representatives
Mr. Scott Emery, B.A.
Mr. Brian McGuigan
Mr. Neil Robertson
Ms. Shirley Wall

Co-opted Members
Dr. Eric Balcom, D.C.L.
Mr. George T.H. Cooper, Q.C.
Dr. Leonard A. Kitz, Q.C.
Miss Elizabeth Ann Macdonald, L.L.B.
Mr. D. Peter MacLellan, B.A.
His Hon. Judge H.S. Nathanson, Q.C.
Mr. Ron C. Phillips
Mr. Cecil R. Thompson

Executive Committee
The Bishop of Nova Scotia
The Bishop of Fredericton
The President
The Vice-President
The Treasurer
Bishop Arthur G. Peters
Dr. George C.S. Bain
Dr. E.W. Balcom
Ms. Shirley Wall
Mr. George T.H. Cooper
The Ven. T.W.F. Crowther
Mr. D. Peter MacLellan
Dr. Colin J. Starnes
Prof. Bruce Archibald

Representatives on Dalhousie University Board of Governors
Mr. George Cooper
Dr. Henry Roper

Representatives on the Governing Body of King's-Edgehill School
The Very Rev. E.B.N. Cochran (1982)
Prof. R. MacG. Dawson (1983)

Ex Officio Member
The Rt. Rev. A.G. Peters, D.D.

Secretary to the Board of Governors
Mrs. Corinne Mackenzie
University of King's College, Halifax, N.S.
B3H 2A1

Officers of Administration

J.F. Godfrey, B.A., M.Phil, D.Phil
President
H. Roper, B.A., M.A., Ph.D.
Vice-President
George C.S. Bain, D.Litt.
Director, School of Journalism
Colin J. Starnes, B.A., S.T.B., M.A., Ph.D.
Director, Foundation Year Programme
D.A. Fry
Bursar
H. Roper, B.A., M.A., Ph.D.
Registrar
W.J. Hankey, B.A., M.A., D.Phil.
Librarian
The Rev. R. Bridge, B.A., M.A., M.Div., A.M., Ph.D.
University Chaplain
The Rev. G. Russell Hatton, B.A., S.T.B., S.T.M., Ph.D.
Divinity Secretary
Mrs. Marjory Gough
Executive Secretary, Alumni Association
The Rev. David P. Curry, B.A., M.A., M.T.S., M. Div.
Dean of Residence
Mrs. Marilyn Curry, B.A.
Dean of Women
B.A. Greenlaw, B.A.
Director of Athletics

Officers of Convocation

The Honourable Mr. Justice R.A. Ritchie, B.A., D.C.L., LL.D.
Chancellor
J.F. Godfrey, B.A., M.Phil, D.Phil.
Vice-Chancellor
The Rev. Dr. R.D. Crouse, B.A., S.T.B., M.Th., Ph.D., D.D.
Clerk of Convocation
J.P. Atherton, M.A., Ph.D
Public Orator

Chancellors of the University

The Very Rev. Edwin Gilpin, D.D., D.C.L., 1891-1897
Edward Jarvis Hodgson, D.C.L., 1897-1911
Sir Charles J. Townshend, D.C.L., 1912-1922
The Most Rev. John HacKenley, D.D., 1937-1943
Hon. Ray Lawson, O.B.E., LL.D., D.Cn.L., D.C.L., 1948-1956
Lionel Avard Forsyth, Q.C., D.C.L., 1956-1958
H. Ray Milner, Q.C., D.Cn.L., D.C.L., LL.D., 1958-1963
Robert H. Morris, M.C., B.A., M.D., F.A.C.S., 1964-1969
Norman H. Gosse, M.D., C.M., D.Sc., D.C.L., LL.D., F.A.C.S., F.R.C.S.(C), 1971-1972
The Honourable Mr. Justice R.A. Ritchie, Q.C., B.A., D.C.L., LL.D., 1974.

Presidents and Vice-Chancellors of the University

The Rev. Dr. William Cochran, 1789-1804
The Rev. Thomas Cox, 1804-1805
The Rev. Dr. Charles Porter, 1805-1836
The Rev. Dr. George McCawley, 1836-1875
The Rev. Dr. John Dart, 1875-1885
The Rev. Dr. Isaac Brock, 1885-1889
The Rev. Dr. Charles Willets, 1889-1904
Dr. Ian Hannah, 1905-
The Rev. Dr. C.J. Boulden, 1905-1909
The Rev. Dr. T.M. Powell, 1909-1914
The Rev. Dr. T.S. Boyle, 1916-1924
The Rev. Dr. A.H. Moore, 1924-1937
The Rev. Dr. A. Stanley Walker, 1937-1953
The Rev. Dr. H.L. Puxley, 1954-1963
Dr. H.D. Smith, 1963-1969
Dr. F. Hilton Page, (Acting), 1969-1970
Dr. J. Graham Morgan, 1970-1977
Dr. J.F. Godfrey, 1977-

ACADEMIC STAFF

King's Faculty (1983-84)

A.J. Andrew, B.A., M.A.(Dal.), D.C.L.(Vind.)
Visiting Professor of Journalism
J.P. Atherton, M.A. (Oxon.), Ph.D. (Liverpool)
Vice-President of the University, Professor of Classics
George C.S. Bain, D.Litt. (Carleton)
Professor of Journalism and Director of the School of Journalism
R.D. Crouse, B.A. (Vind.), S.T.B. (Harv.), M.Th. (Trinity), Ph.D. (Harv.), D.D. (Trinity)
Professor of Classics
T.H. Curran, B.A. (Trinity), M.A. (Dal.), M.T.S. (A.S.T.)
on leave
D.P. Curry, B.A., M.A., M.T.S., M. Div.
Dean of Residence
R. MacGregor Dawson, B.A. (Trinity), M.A. (Tor.), B. Litt. (Oxon.)
Associate Professor of English
John F. Godfrey, B.A. (Trinity), M.Phil, D.Phil. (Oxon.)
President of the University, Associate Professor of History
W.J. Hankey, B.A. (Vind.), M.A. (Tor.), D.Phil. (Oxon.)
Associate Professor of Classics, Librarian
A.M. Johnston, B.A. (Mt.A.), M.A. (Dal.)
Associate Director, Foundation Year Programme
Stephen Kimber
Assistant Professor of Journalism
H. Eugene Meese, B.A. (Ohio State), Dip. Journ. (U.W.O.)
Assistant Professor of Journalism
F. Hilton Page, M.A. (Tor.), D.D. (Pine Hill)
Professor of Philosophy
H. Roper, B.A. (Dal.), M.A., Ph.D. (Cantab.)
Associate Professor of Humanities and Social Sciences, Vice-President, Registrar
C.J. Starnes, B.A. (Bishops), S.T.B. (Harv.), M.A. (McG.), Ph.D. (Dal.)
Associate Professor of Classics, Director of the Foundation Year Programme
D.H. Steffen, Ph.D. (Gott.)
Associate Professor of German
K.E. von Maltzahn, M.S., Ph.D. (Yale)
Professor of Biology
Ian R. Wiseman, B.A. (M.U.N.)
Assistant Professor of Journalism (on leave)

Associate Fellows

Elizabeth Beale, B.A., M.A.
Senior Economist with Atlantic Provinces Economic Council
Alexander Beveridge, B.A., M.A., LL.B. (Dal.)
Partner in Law Firm of Daley, Black & Moreira
Y. Glazov, Ph.D. (Oriental Institute, Moscow)
Professor of Russian and Chairman of the Department, Dalhousie University
J.F. Graham, B.A. (U.B.C.), A.M., Ph.D. (Col.), F.R.S.C.
Fred C. Manning Professor of Economics, Dalhousie University
N.H. Graham, B.A., B.Ed. (Dal.)
G.P. Grant, B.A. (Queen's), D. Phil. (Oxon.), LL.D. (Trent), D.Lit (Mount A.), LL.D. (Dal.), LL.D. (Queen's), LL.D. (Tor.), LL.D. (Acadia), F.R.S.C.
Professor of Humanities, Dalhousie University
W.H. Kemp, Mus.Bac., Mus.M., (Tor.), A.M. (Harv.), D.Phil. (Oxon.)
Professor of Music, Dalhousie University
Her Honour Judge Sandra E. Oxner, B.A., LL.B. (Dal.)
Judge of the Provincial Court of Nova Scotia
Mr. Justice Robert J. McCleave, Q.C., B.A., LL.B. (Dal.)
Justice of the Provincial Court of Nova Scotia
J.D. McNiven, B.A., M.A., Ph.D. (Mich.)
Deputy Minister, Department of Development, Province of Nova Scotia
John A. Yogis, Q.C., LL.B. (Dal.), LL.M. (Dal.) LL.M. (Mich.)
Professor of Law, Dalhousie University
Gordon Proudfoot, B.B.A. (Acadia), LL.B. (Dal.)
Partner in Law Firm of Boyne, Clarke

HISTORICAL SKETCH

The history of higher education in Canada began in 1789 with the founding at Windsor, Nova Scotia, of the University of King's College. At the time of its establishment it was, with the exception of the fifteenth-century King's Colleges in Cambridge and in Aberdeen, the only foundation of that name in existence. Although there had been a King's College, New York, chartered by George II in 1754, it did not survive the end of the colonial period in America and its reorganization in 1784 under the name of Columbia College was undertaken on an entirely different plan. The Loyalist political and religious principles upon which the New York seminary had been founded migrated, along with the Loyalists themselves, to Eastern Canada, and in 1802 a Royal Charter was granted by George III proclaiming King's College, Windsor, "The Mother of an University for the education and instruction of Youth and Students in Arts and faculties, to continue forever and to be called King's College."

From the beginning, size was never a determining factor since nothing prevented the Loyalists from sending their children to the larger established American Universities. But they would not do this just because they were not convinced of the wisdom of too quickly severing ties with the Old World. Located in Windsor, Nova Scotia, the College served the colonists and their descendants for 131 years. It produced a long list of distinguished graduates nurtured on the classical traditions of Western European civilization until, in the disastrous fire of 1920, the main building was burnt to the ground.

Although in spite of this calamity the University was determined to maintain its old purpose and vision, it now recognized that if it was to do so in the 20th Century, it could no longer simply draw on the strength of the old European culture but had also to become fully involved in the vigorous and developing civilization of North America. As a result the University accepted the terms of a munificent grant from the Carnegie Foundation, and moved to Halifax and into its association with Dalhousie University which, with a Royal Charter dating from 1820, is the third of Canada's senior universities. By an agreement reached in 1923, the two universities on the same campus have maintained joint faculties of Arts and Science, so that undergraduates of King's read for the B.A. and B.Sc. of Dalhousie, King's having left her own degree-granting powers in abeyance in these faculties. King's students registered in Arts and Science attend classes with Dalhousie students; *the students of both institutions follow the same curriculum, take the same examinations, and must attain the same academic standard.*

In May, 1941, the King's College buildings were taken over by the Royal Canadian Navy as an Officer's Training Establishment, and during the next four years, until May, 1945, nearly 3100 officers were trained for sea duty with the R.C.N. The students and academic staff of King's carried on during this period through the kindness of Dalhousie University and Pine Hill Divinity Hall.

In July 1971, King's College entered into a partnership agreement with Pine Hill Divinity Hall (for the United Church of Canada) and the Corporation of the Roman Catholic Archdiocese of Halifax to found the Atlantic School of Theology. This unique institution provides ecumenical as well as denominational theological education for candidates for the ministry and for laymen. During 1974 the School received incorporation as a degree-granting institution of higher education; thus the work previously done by the Faculty of Divinity of King's College is now conducted by that School. King's holds in abeyance its powers to grant degrees in Divinity in course. King's grants the honorary degree of D.D. and also that of Doctor of Civil Law (D.C.L.), and Doctor of Canon Law (D.Cn.L.).

A significant development in King's history began in the 1972/73 academic year with the introduction of the Foundation Year Programme for first year undergraduates. By taking advantage of its independence from the dominant concerns of a large modern North American University, and yet drawing strength from its very close association with Dalhousie, King's established this Programme, which is unique in Canada and aims to provide the solid foundation of a modern humanistic education through a comprehensive view of Western Civilization from its beginnings in the Ancient World up to the present day. This course is available only to students registered at King's though in all other respects their education is conducted within the joint faculty of Arts and Science. In 1977 the University took another step forward by establishing the only degree-granting School of Journalism in the Atlantic Provinces. This School now offers two degree programmes (B.J. Honours and B.J.).

King's College is residential, on the Oxford and Cambridge pattern, and, in addition to the day students who live out, 115 men and 110 women can be accommodated in residence. The inestimable benefits of life in a small residential college are, in England at least, an accepted part of the "Oxbridge" tradition, but this is certainly not so in North America, where universities have in general followed either the German policy of having no residential facilities at all, or the English provincial plan of housing a proportion of the student body in "halls of residence" entirely separated from the university itself. The corporate life in King's thus emerges as something rare on the North American continent, since it is designed to educate "the whole man" and not simply to train him for specific examinations.

In addition to its athletic activities, the College runs a Debating Society, known as the "Quintilian", and a Dramatic Society. Daily Services are held in the Chapel for those who wish to participate. Although the College is an Anglican foundation, there is no denominational bar aimed at the exclusion of non-Anglicans from membership of the College, either as lecturers or students. Members of Faculty may themselves be resident and function in the tradition manner as "dons" for the staircase (i.e. "bays"). The bays are named Chapel Bay, Middle Bay, Radical Bay, North Pole Bay, Cochran Bay (co-ed), and The Angel's Roost. Alexandra Hall is the residence for women only.

Drawing its strength from both the older tradition of classical European culture and at the same time offering its students all the opportunities and challenges of a large modern North American University through its association with Dalhousie, King's tries to maintain itself in the Canadian context as a miniature of the Christian ideal of the larger community.

Constitution

The Board of Governors is the Supreme Governing Body of the University. It consists of the Bishops of the Diocese of Nova Scotia and Fredericton, the President of the University, the Vice-President, the Treasurer, four members elected by the Faculty, together with eight members elected by the Alumni Association, four members by the Students' Union, six by each of the Synods of Nova Scotia and Fredericton, and not more than eight co-opted members. The Governors have the management of the funds and property of the College, and the power of appointment of the President, professors and officials. The Board appoints an Executive Committee.

Convocation consists of the Chancellor and the Vice-Chancellor, together with all Bachelors of Divinity and Masters and Doctors of the University; Members of the Board of Governors and of the Faculty of Arts and Science who hold the degree of Master or Doctor from any recognized University; Fellows of the University and Bachelors of the University of five years' standing who are recognized by the Clerk of Convocation. All degrees are conferred by Convocation.

The Chapel

An attractive collegiate chapel provides a centre of spiritual life on the campus. All students, regardless of their denominational affiliations, are cordially invited to attend the daily Anglican services conducted in the chapel.

The offices of Mattins and Evensong are said in the chapel Monday through Friday, and the Holy Eucharist is celebrated daily during term. The chaplain is assisted by other campus clergy in the daily celebrations, and there is a wide variety of liturgies and liturgical styles, ranging from traditional to contemporary forms.

Students take a large responsibility for the operation of the chapel, and normally they conduct the daily offices. An active guild of student acolytes assist at the daily Eucharist, and an active sanctuary guild cares for the altar and its appointments. An excellent choir, with an impressive repertoire, sings three services in the chapel each week in addition to various guest appearances during the year. A group of contemporary musicians sing a Folk Mass each month.

The Anglican chaplain is available to all students for pastoral counselling.

King's College Library

King's College Library was founded in 1789. In 1800, Bishop Inglis sent his son to England with £250 to begin the purchase of books. The library grew steadily during the 19th century and was probably one of the best libraries in English-speaking Canada of the time. There were various benefactors over the years, chief of whom was Thomas Beamish Akins. From Mr. Akins the library received many items in its rare collection of some 40 incunabula (books printed before 1500, that is, during the first fifty years since the invention of printing with movable type). This is a remarkable number of these very rare books to be found in a library of this size.

King's Library is very rich in the field of English literature. Much of the credit for the development of this field must go to the late Professor Burns Martin. The Professor Burns Martin Memorial Fund continues to aid the library's growth in this area.

With the help of William Inglis Morse Endowment for Canadiana, this important area of study is growing steadily as more and more works are being published about our country.

The largest proportion of books, however, is found in the field of theology. This collection is large and comprehensive and is being kept up to date constantly. The John Haskell Laing Memorial Bequest helps with the purchase of books in this field.

Book purchases in the general field are aided by memorial funds to the following persons: the Hon. William Johnston Almon, Frances Hannah Haskell, James Stuart Martell, and Thomas Henry Hunt (Alumni Memorial).

The Library hours are:

Monday to Friday	9:00 a.m. - 5:00 p.m.
Monday, Tuesday, Thursday, Friday evenings	6:00 p.m. - 11:00 p.m.
Wednesday evenings	7:30 p.m. - 11:00 p .m.
Saturday	9:00 a.m. - 12:00 noon 1:00 p.m. - 5:00 p.m.
Sunday	2:00 p.m. - 5:00 p.m. 7:00 p.m. - 11:00 p.m.

The student loan period for all books except those on reserve is two weeks. Journals circulate for one week.

Fines are charged for overdue books at the rate of fifty cents a day.

Students are given the privilege of borrowing books for the summer.

Degrees

The degrees of Doctor of Divinity, Doctor of Canon Law and Doctor of Civil Law, may be conferred *honoris causa* in recognition of eminent literary, scientific, professional or public service.

The dignity and honour of Fellow may be conferred by the vote of Convocation upon any friend of the University for noteworthy services rendered on its behalf.

The honour of Associate Fellow is conferred by the Board of Governors on the Recommendation of Faculty and President.

The University confers the degrees of Bachelor of Journalism (Honours) and Bachelor of Journalism in course.

Convocation confers the Master of Sacred Theology in Pastoral Care on recommendation of the Graduate Studies Committee of the Institute of Pastoral Training.

Pre-professional work in Arts and Science by students intending to enter one of the Dalhousie professional schools may be taken as a student of King's College.

The Dalhousie Senate confers the degrees of Bachelor of Arts and Bachelor of Science ordinary and honours, in course, at the King's Encaenia.

ADMISSION REQUIREMENTS

A. Admission to the Dalhousie-King's Faculty of Arts and Science

1. General Statement

For further information on admission to the Faculty of Arts and Science, visit, write or telephone: the Registrar's Office, University of King's College, Halifax, N.S. B3H 2A1 (902-422-1271).

Minimum age
No person under sixteen years of age is admitted except by special permission of the Senate.

Language requirement
Applicants whose native language is not English must give evidence that they are proficient in spoken and written English. This may be done by presenting a certificate of having passed the English Language Test of the University of Michigan, or the Test of English as a Foreign Language (TOEFL), both of which are administered in various centres throughout the world. Information may be obtained by writing to the English Language Institute, Testing and Certification Service, Ann Arbor, Michigan 48104, U.S.A., or TOEFL, Box 899, Princeton, New Jersey, 08540, U.S.A.

Definitions
(a) *Undergraduates* are students who are candidates for an undergraduate qualification.

(b) *Full-time students* are those registered for three full-credit classes or more or the equivalent of three half-credit classes or more in either first term or second term.

(c) *Part-time students* are students registered for fewer than three full-credit classes or the equivalent of three half-credit classes in either first term or second term. For purposes of definitions (b) and (c), a full-credit class is equivalent to 6 credit hours.

(d) *No-degree students* are students who are not candidates for a degree or diploma but who wish to take one or more university classes which may be allowed for credit. This is not the same as *auditing* a class. No-degree students must satisfy the normal admission requirements.

(e) *Matriculation standing: Senior matriculation* designates the level of studies attained by students who have successfully completed Grade XII in a public high school in Nova Scotia or its equivalent elsewhere.

(f) *Credits:* See General Undergraduate Regulations 2.

Students who have attended another recognized university or a junior college may, on presentation of satisfactory documentary evidence, be granted credits for appropriate classes, within the limits of the **Regulations** set out below.

Special Cases
See the University regulations in the preliminary pages of this calendar and Section 5 below. *Admission of Mature Students and Those Lacking Normal Admission Requirements.*

2. Admission from High Schools in Nova Scotia, New Brunswick and Prince Edward Island

General
The normal minimum requirement for admission to King's College is completion of at least five appropriate senior level university preparatory subjects in the final year, as outlined below in the section "Preparation for Admission". An average of 60% in Grade XII high school examination, or the equivalent, is required. Special consideration will be given to grades in English and Mathematics. The University does not apply criteria mechanically. It reserves the right to refuse admission and also has discretionary power to admit students who do not meet the normal requirements, but who appear acceptable on other grounds. Any student who submits the appropriate documents will be considered for admission.

Early Acceptance
Students who have been receiving good marks (a general average of 70% or more) will be considered for admission before the final results of their senior year are known. Such students are encouraged to apply early during their last year at school.

Application Procedure
Applicants must submit a completed application form obtainable from the Admissions Office, pay the required fee, and forward any necessary supporting documents. If final documents, e.g. transcripts, are not available at the time of application, they must be submitted before registration. Those applying to particular programmes MUST do so by the dates specified in the Almanac at the beginning of this Calendar. To complete the application, a candidate must provide:

(a) evidence of successful completion of Grades XI and XII in the University Preparatory Programme (senior Matriculation standing) from a public high school in Nova Scotia, or the equivalent (see below), as shown in a certified high school record-transcript, Provincial Examination Certificate, or Principal's report;

(b) recommendations from high school officials

(c) university transcript for current and previous academic years in the case of transfer students.

Decisions on admission will be made known to applicants as soon as possible after their credentials have been received and studied.

Preparation for Admission
Students wishing to study at King's College must choose their high school subjects from a University Preparatory Programme. At least five senior level subjects must be taken in the final year. All students are required to have taken Senior level English (plus Mathematics for admission to any programme in Science, and certain other programmes) and at least two other (one other if Mathematics is a mandatory selection) senior classes chosen from Biology, Chemistry, French, German, History, Latin, Mathematics and Physics. The remaining required classes may be chosen from the above list or selected from senior classes in Economics, Geography, Geology, Law, Modern World Problems, Music, Political Science, Sociology or Spanish. Any special or experimental classes taken must previously have been deemed acceptable by Dalhousie. For such information and any other advice necessary, student should consult their high school guidance counsellors, the Registrar of Kings, the Dalhousie Admissions Office, or the Dean of Freshmen at Dalhousie.

Students should also read the sections of the Calendar headed **Degree Programmes and Programmes of Study** and refer to the admissions brochure to ensure that their high school programme satisfies entrance requirements to particular programmes at Dalhousie/Kings. Students should note that admission to the University does not guarantee admission to all programmes.

3. Admission from Outside the Maritime Provinces at Senior Matriculation Level

Deadlines for Receipt of Applications
Applications for admission from *any part of Canada or the USA* must be received by the Registrar's Office by August 1 in order to ensure prompt and efficient handling.

Applications from *all other countries* should be received by May 1.

Application procedure and ways of appraising applications: as for students from the Maritime Provinces.

Equivalences
The following levels are considered equivalent to Senior Matriculation (Grade XII) in Nova Scotia:
Other Provinces of Canada
(a) *Newfoundland:* first year Memorial University.

(b) *Quebec:* Senior High School Leaving Certificate; or Quebec Diploma of Collegial Studies (D.C.S.). Well qualified students *may* be admitted after one year of CEGEP.

(c) *Ontario:* Grade XIII (Secondary School Honour Graduation Diploma), or very high standing in Grade XII.

(d) *Manitoba, Saskatchewan, Alberta, British Columbia:* Grade XII.

Other Countries
(e) *USA:* Outstanding students may be admitted from U.S.A. Grade XII on the basis of advanced placement work or high SAT or CEEB series; transfer credits will be considered for such outstanding students if they have completed a full year of study with good standing at a recognized university (minimum: 30 semester hours) elsewhere.

Other students from the U.S.A. can be admitted only after completing a first year at a recognized university (minimum: 30 semester hours) and credit, if any, for that year's work is settled on an individual basis.

(f) *Great Britain, West Indies, West Africa:* General Certificate of Education with pass standing in at least five subjects, of which at least two must be at Advanced level, and one must be English.

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

(h) *Bangladesh, India, Pakistan:* Bachelor's degree with first or second class standing from a recognized university; or in certain circumstances, first-class standing in the Intermediate examinations in Arts and Science, provided the candidate has passes at the university level in English, Mathematics and a language other than English.

(i) *Countries not mentioned above:* Write to the Registrar's Office, University of King's College, for further information.

4. Transfer from other Colleges and Universities

Deadlines for Receipt of Applications
Canada and the USA: August 1.
Other Countries: May 1.
Applications received after the above dates will be considered, but prompt processing cannot be assured.

Documents to be Submitted
(a) Completed application form (available from Registrar's Office);

(b) Official academic transcripts (or certified copies) from all colleges and universities attended;

(c) Copies of calendars (or similar publications) of all colleges and universities attended;

(d) Certification of proficiency in English if the native language of the applicant is another language;

Certified copies of original documents, or relevant sections of documents (e.g. calendar pages) are acceptable in lieu of originals. Certificates in languages other than English or French must be accompanied by certified translations into English or French.

General Regulations Concerning Transfers *(See also General Faculty Regulations).*

Students who have attended another recognized university or a junior college may, on presentation of satisfactory documentary evidence, be granted credits for appropriate classes, within the limits of the **Regulations** set out below.

(a) A student from another college or university who is not eligible for re-admission to that college or university on academic grounds will not be admitted to King's College.

(b) No transfer credit will be granted for any class in which a final mark of less than C (or the equivalent) was obtained, or for any class in which a final mark was granted conditionally.

(c) To obtain a first degree from the Faculty of Arts and Science, Dalhousie-King's University, at least half of the classes, including at least half in the field of concentration, must normally be taken at Dalhousie-King's.

(d) A student in a Dalhousie-King's honours programme must attend Dalhousie-King's as a full-time student in his last two years, unless special permission to the contrary is obtained from the Committee on Studies.

(e) No classes taken at another institution will be counted towards fulfilling the concentration requirement of the Bachelor's degree or the principal subject requirement of an honours programme without specific approval from the departments concerned at Dalhousie.

(f) 1. Transfer credits may be granted only for classes which are offered by a recognized university or equivalent institution of higher learning and which are judged to be of comparable standard to classes offered at Dalhousie and to be appropriate to an academic programme at Dalhousie in the Faculty concerned.

2. Transfer credit for classes falling within the scope of Dalhousie departments are subject to approval by those departments.

3. Transfer credits are not normally granted for classes that do not fall within the scope of any Dalhousie department. Students may, however, apply to the appropriate Faculty Committee for the transfer of credits for such classes where they can justify the inclusion of such classes in their proposed programme.

(g) No credit will be given for any classes taken at another university while a student is inadmissable at Dalhousie-King's.

5. Admission of mature students and those lacking normal admissions requirements

In individual circumstances, the University may admit persons who lack the normal high school preparation including those who have been away from school for a number of years, provided they can show by letter and through interview that they possess qualities such that they may be expected to benefit from university studies.

B. Admission to the School of Journalism, the University of King's College

1. Admission to the four year B.J. (Hons.) programme
For applicants from High School. (See below -2- for application procedure for admission to one year B.J. degree programme—for applicants who hold a Bachelor's degree.)

General
The normal minimum requirement which applicants must possess to be considered for admission to the B.J. (Hons.) programme, is that for admission to the Dalhousie-King's Arts and Science programme. As the number of places in the programme is limited, it is expected that only a proportion of qualified applicants will be admitted; selection will be made on a competitive basis.

Application Procedure
Candidates for admission to the School of Journalism must apply using the Dalhousie-King's common application form (available from the Registrar's Office, or from most high schools). Completed application forms should be received by the Registrar as soon as possible after January 1, and not later than April 15. Late applicants will be considered only if space is available. Candidates must indicate on their application form that they are applying for admission to the B.J. (Hons.) degree. The following supporting evidence must also be provided by the candidate.

(a) evidence of successful completion of Grades XI and XII in the University Preparatory Programmes (Senior Matriculation Standing) from a public high school in Nova Scotia, or the equivalent, as shown in a certified high school record-transcript, Provincial Examination Certificate, or Principal's report.

(b) recommendations from high school officials.

When these documents have been received, applicants judged to have obtained the minimum requirements will be so notified by the Registrar, University of King's College.

With this notification, you will receive advice from the School of Journalism about written work which will be needed to complete your application.

These articles, when requested, should be addressed to:

George Bain
Director, School of Journalism,
University of King's College,
Halifax, N.S. B3H 2A1

Your written work is intended to tell us something about you and also to let us see how well you express yourself on paper. This constitutes a regular part of the application and influences the decision on admission.

The school follows a policy of considering applications as they come in, and the number of places is kept deliberately small. It is to the advantage of the applicant, therefore, to complete the submissions as early as possible. Applications ordinarily will be completed by April 15. Late applications will be considered only if space remains.

A reasonable ability to type is required. Students should note the policy on the School of Journalism with respect to this matter as stated in this calendar under the heading "Typing Requirement."

2. Admission to the one year B.J. programme
For applicants who hold a Bachelor's degree.

General
The intention of the B.J. programme is to foster the professional development of students so that they may fill editorial positions in news organizations with not only a high degree of technical competence, but responsibility, dedication and a sense of purpose. It is designed to do two things—to give students a mastery of the techniques of news gathering, writing and presentation, this in a newsroom atmosphere; and to acquaint them with issues so as to provide the sort of background essential to the knowledgeable reporting of increasingly complex affairs.

Although other academic qualifications may be considered, normally only those students may be admitted to this programme who have successfully completed a B.A. or B.Sc degree at a recognized university with a minimum average of B. Enrolment is limited and students will not ordinarily be admitted unless their record shows a broad acquaintance with the history of the development of western civilization such as that which is provided by the Foundation Year Programme outlined in the University Calendar. Prospective students who have not taken the Foundation Year Programme in the first year of their first degree and who are in course at another institution are advised to consult with the University on the course of studies which will best prepare them to meet this requirement.

Application Procedure
For admission to the one year B.J. programme the student must:

1. Complete the Dalhousie-King's common application form available from the Registrar. Students must indicate on the application form that they are applying for the B.J. degree. This form must be returned to the Registrar, University of King's College.

2. Submit a transcript of credits covering undergraduate and any graduate work.

3. Be prepared to demonstrate before graduation a reading knowledge of French. The University administers such a test at the beginning of the Fall Term and at the end of the Spring Term and it may be taken more than once without penalty. The student is required to translate—the use of a dictionary is permitted—a designated passage or passages from a current French-language newspaper, such as le Devoir. No French courses will be offered or available to B.J. students during the academic year but informal help, on a no credit, basis will be available in the School of Journalism itself for students who wish it.

4. As in the case of admission of the B.J. (Hons.) programme, applicants will be asked to submit written work. More information about this will be mailed to you when the Dalhousie-King's common application form has been received. When completed, your written work should be mailed to

George Bain, Director, School of Journalism, University of King's College, Halifax, N.S. B3H 2A1.

5. All assignments are typewritten, therefore students must know how to type, not to a stenographic standard, but with reasonable speed and accuracy.

6. Prospective students should note that the B.J. programme begins before the regular session of the Faculty of Arts and Science. For the academic year 1984/85 registration is on August 27 and classes begin on August 28.

The School takes into account the student's academic records, contributions to school, university, and other publications, extra-curricular activities, and other evidence of a keen interest in journalism. Previous professional experience or writing, though frequently a good test of motivation, is not essential.

The School follows a policy of continuously reviewing applications and admits only a limited number of qualified applicants. Thus it is to the advantage of the applicant to complete the submissions as early as possible. Application forms must ordinarily be received by April 15. Late applications for admission will be considered only if space is available.

Students are admitted for the full-year course which begins August 28. The School has no regular summer session, offers no correspondence courses and accepts no part-time students in the one-year B.J. programme.

KING'S COLLEGE RESIDENCES

Dean of Residence
The Rev. David P. Curry, B.A., M.A., M.T.S., M.Div.

Dean of Women
Mrs. Marilyn Curry, B.A.

Dons (1982-83)
Mr. Charles Butts, B.Sc.
Mr. Anthony Burton, B.A.
The Rev. Prof. W.J. Hankey, B.A., M.A., D.Phil.
Mr. Kenneth Kierans, B.A.
Ms. Marilyn MacNeil, B.A., B.J.
Ms. Kelly Teahen, B.A.
Ms. Judy White, B.A.

Residence life at the University is encouraged for all students, because the life in a small residential college is one of the great experiences of one's years at university. All students registered at King's College are normally guaranteed residence accommodation, upon completion of an application for residence, and subject to the approval of the Dean of Residence or the Dean of Women.

All rooms are furnished with bed, dresser, desk, and chairs. Students are required to provide their own bedding and towels, and to attend to their own laundry arrangements. Washing and drying equipment is provided in both men's and women's residences.

Single and double rooms are available to both men and women, priority for single rooms being given to students in the upper years.

The Men's Residence is divided into Bays; and in them there are both single and double rooms. A "double" for men is defined as a suite of two rooms shared by two male students.

The Women's Residence was built in 1962 and is modern in every respect. Traditional double and single rooms are available and in addition the residence provides a living room, a laundry room, a recreation room, three lounges with kitchenette facilities, a service elevator, and ample storage space.

Both residences are designed so that it is not necessary to go outside for meals and extra-curricular activities.

Cochran Bay, a co-ed Bay with its first floor for male students and its second and third floors for female students, was designed to equalize male-female accommodation and is open to senior students only.

Meals are prepared and served to all resident students in Prince Memorial Hall, erected in 1962.

Applications for accommodation in all residences are accepted on the understanding that the student will remain for the whole academic session. No student may withdraw from residence without permission from the Deans. Students withdrawing from residences are required to give one month's notice in writing to the Deans. Students withdrawing after occupying a room will lose their room deposit. In addition a penalty of $50.00 will be imposed for failure to give one month's notice.

It should be noted that the University assumes no liability for personal property in the case of theft or damage. No pets of any kind are allowed in residence.

The residence will be open for new and returning students from 2:00 p.m., September 4, 1984 until the morning of the last day of examinations in the Faculty of Arts and Science for the Fall Term. The residence will reopen on January 3, 1985, and remain open until the morning of the last day of examinations in the Faculty of Arts and Science for the academic year.

Students in their graduating year are permitted to remain in residence until the morning after the last day of Encaenia activities. Resident students in faculties whose terms exceed those periods may reside in the College by permission of the Deans on payment of rent. When Prince Hall is open, meals may be purchased.

As the residences will not be open during the Christmas holidays, students are urged to make arrangements for their Christmas vacations as early as possible in the Fall term. Except under unusual circumstances and with the permission of the Deans, no student is permitted to occupy the residences over the Christmas holidays.

Confirmation of accommodation will not be made until the student has been accepted by the University for the coming session and a $100.00 residence deposit has been received by the Bursar's Office.

Cancellation of an application received by the Registrar or the Deans prior to August 1st will entitle the student to a refund of the $100.00. Failure to cancel with the Registrar or the Deans before August 1st will result in forfeiture of the $100.00 deposit.

Day Student Hostels

Limited overnight accommodation is available for King's Day Students in the form of male and female "hostels" on campus, each of which can accommodate four persons at once. Space is available, to a maximum of three nights per week per student on a first-come, first-serve basis for a minimal *per diem* charge. Lockers are available for the safe storage of personal effects. With this limited overnight accommodation Day Students will be able more comfortably to make use of campus facilities such as the library, attend campus functions such as evening lectures and debates, and in general participate more fully in the total life of the King's community.

(A student enrolled at King's is required to pay the King's Student Union Fee of $72.00, but not the Dalhousie Student Union Fee, or the Rink and Athletic Field Fee. However, any King's student who wishes to participate in the Dalhousie Student Union activities must pay both of the above Dalhousie Fees. Dalhousie students resident at King's College must pay a Student Union Fee of $72.00.)

FEES AND CHARGES

Academic and Related Fees

Fees are subject to change. Those payable in 1983-84 are as follows:

Full-Time Students - Academic and Student Fees
Full-time students include those registered for fall and winter terms for more than three full-credit classes and those registered for either term for more than three one-half credit classes. Students may be registered full-time in one term and part-time in another.

Fees are due and payable at registration but if preferred, those registered full-time for fall and winter terms may pay in two installments, the first payable before September 30, 1984, the second on or before January 25. A carrying charge of $10.00 is added if fees are not completely paid at registration, and delay in payment will result in suspension from the University.

Foreign Students - Effective September 1979
Students registered in a programme at Dalhousie or King's for the first time who are not Canadian citizens or permanent residents are required to pay **an additional fee of $1,300.00** if registered on a full-time basis, or if registered part-time, a proportionate fee related to their part-time studies. This applies to students entering a programme for the first time or students who have completed one programme and are registered for a new one. (Any assessed differential must be paid in full with the **first** installment, and is payable each year the student attends and is considered a visa student.)

Faculty	University Fee	Society Fee	Total	In Full at Registration	OR	Payable in 2 installments (incl. carrying charge of $20.00) At Registration	Bal. Jan. 25
Arts and Science	$1300.00	$5.00	$1305.00	$1305.00		$850.00	$475.00
Journalism	$1350.00	—	$1350.00	$1350.00		$850.00	$520.00

Part-Time Students - Academic and Student Fees
Part-time students are expected to complete the registration process and pay a minimum fee of $50.00 on or before August 31 to pre-register and the first installment after that date to register. For those registering for classes completed in one term the total of university and incidental fees are payable at the time fixed for registration. Those registered for classes that extend over two terms may elect to pay fees for those classes in two installments. If payment is made by installments, a carrying charge of $10.00 is added to fees payable in the second installment, and for each class extending over two terms, $140.00 constitutes the first installment and $93.50 the second installment.

Undergraduate class fees are as follows:

	University Fee	Student Union Fee
One-third credit class	$82.50	$7.50
One-half credit class	$130.00	$7.50
One full credit class	$280.00	$15.00
Two full credit classes	$560.00	$30.00
Three full credit classes	$840.00	$72.00 (full Student Union benefits)

Audit Students
Students who wish to audit a class but not for degree credit are required to register and pay fees at registration on the following basis:

	University Fee
One-third credit class	$41.50
One-half credit class	$65.00
One full credit class	$130.00

A student registered to audit a course who during the session wishes to receive credit for the class must receive approval from the Registrar and pay the difference in class fees plus a transfer fee of $25.00.

Summer Session Students
Students registered for the first or second summer session pay fees on registration dates. Late registration penalty must also be paid if applicable.

Regulations for Payment of Fees
Fees must be paid in Canadian funds by cash or negotiable cheque. If payment is made by cheque returned by bank as non-negotiable, the account cannot be considered paid. Interest will be charged if the account is in arrears and $5.00 will be charged for any cheque returned as non-negotiable by a bank. Late registration penalty must also be paid if applicable.

Application Fee
An application fee of $15.00 is required with the application form submitted by any student for any programme except those in which the applicant has been previously enrolled. If the fee is paid for in a given session, and the applicant does not attend, whether accepted or not accepted, and an application is made for a subsequent session, the fee is again payable. Application fees are not refundable and are not applied as a credit to class fees.

Application fees are not refundable and are not applied as a credit to class fees.

Admission Deposit
A deposit of $100.00 is required by all new students within 3 weeks of acceptance by Dalhousie. A refund of 75% will be given students who notify the Registrar's Office in writing of non attendance by August 31. There is no refund for limited enrollment programmes. No deposit by new or returning students will be accepted after the end of **official** registration dates as set out in the calendar. (First installment of fees is due if registration after official dates.) Where fees in full are payable by a government or other agency, a deposit paid by an individual will be refunded to the student by November 15, unless the account is not paid by that date. In this case refund will be made as soon as payment is received.

Registration Fees
All students are expected to register on or before the specified dates. To complete registration a returning student is required to complete the registration process, including any necessary class selection or approval, and to pay a minimum fee of $50.00 (before last official registration date, and the first installment after that date to register), which will be credited to fees. This payment must be made by all students including those on scholarships, fellowships, student loans, or whose fees are to be paid by external agencies, and **commits** the student to the payment of the balance of fees unless formal action to withdraw is taken **in writing** at the Registrar's Office. New students are expected to register on or before the specified dates. To complete registration a new student is required to complete the registration process, including any necessary class selection and approval, and give completed forms to the Registrar's Office.

Late Registration
September Registration
Students are required to register on or before specified dates as indicated in the almanac. Late registration requires the approval of the Dean of the Faculty/Registrar and, if this is granted, payment of a fee of $25.00 before September 30 and $100.00 if after September 30.
January Registration
Students are required to register on or before the specified date as indicated in the almanac. Late registration requires the approval of the Dean of the Faculty/Registrar and, if this is granted, payment of a fee of $25.00 before January 30 and $100.00 if after January 30.

Payments
Fees are due and payable at registration. Full-time students and part-time students with classes extending over fall and winter terms may pay fees in two installments.

Bills for fees will not be issued. The receipt issued at registration will show the balance outstanding.

Students planning to pay the first installment of fees from a Canada Student Loan should apply to their province as early as possible so that funds will be available at registration.

Scholarships or bursaries paid by or through Dalhousie University may be applied to fees. Students must produce at registration adequate documentary evidence of entitlement to the sums claimed under the award. If fees are to be paid by a government or other agency, a signed statement from the agency must be presented at registration. (All such students are required to pay $25.00 on registration.)

Fees cannot be deducted from salaries paid to students who are employed by Dalhousie University.

Late Payment
Interest at the rate of 1.5% monthly (18% per annum) will be charged on any balance of fees outstanding after the registration date except where payment of a second installment is permitted. When fees are paid within two weeks of the last date for regular registration, interest charges will be foregone. Students whose accounts are more than 30 days in arrears may be dismissed from the University. If such students are subsequently reinstated, a penalty of a minimum of $25.00 to a maximum of $100.00 will be charged.

Fees Deductible For Income Tax

The amount of fees constituting an income tax exemption for the student is calculated by deducting from the total charge (1) the portion of the Student Union Fee for operating expenses of the Union ($72.00 or $7.50, as applicable) and (2) the Society Fee. Fees may be claimed as a deduction only by the student. A special certificate for income tax purposes will be issued on request to the Cashier, Dalhousie, in February of each year (for students in Arts and Science) or the Accounts Bursar at King's (for students in Journalism.)

Other Charges

Identification Cards
All new, full- and part-time students may obtain an identification card upon registration and payment of proper fees. I.D. Cards for those who register early for the regular academic year are issued by the I.D. Office (located in the central foyer of the Arts and Administration Building basement) starting on the first weekday in June. For either summer school session, I.D. Cards are issued starting 2 weeks prior to the beginning of final registration. Student I.D. Cards will only be issued upon presentation of the appropriate requisition form, authorized by both the Registrar's Office and the Cashier or Student Accounts Office. If these cards are lost, authorization for a replacement may be obtained from the office of the Registrar. A fee of $10.00 is charged for all replacement I.D. cards except those expressly directed by the University. Regular academic year I.D. cards remain valid until the beginning of the following academic year (including summer session). (I.D. cards issued specifically for a summer session expire at the conclusion of that session). At the commencement of subsequent consecutive years, validation stickers are affixed to the "expired" I.D. card. Students in the School of Journalism cannot receive their I.D.'s until they register in September.

Laboratory Charge
No laboratory deposit is charged. Students will be charged for careless or willful damage.

Examinations
An application for a supplemental examination must be accompanied by the proper fee.

Supplemental and Special Examinations
(Per examination) $25.00
Extra fee for each examination written at an outside center $25.00
Fee will be forfeited unless application for refund is made on or before July 31, or in the case of February supplemental examination, January 31.

Fee for reassessment of a class grade (when permitted) is $3.00.

Degree in Absentia
Any graduating student who is unable to appear at Encaenia is expected to notify the Registrars of Dalhousie and King's in writing prior to May 4 (or October 15 for Fall Convocation), giving the address to which the diploma is to be mailed. There is a $20.00 fee payable by students who wish to be graduated in absentia, and this should accompany the notification. In any case where notification is not received by the required date, and a student does not appear at Encaenia, the fee will be $40.00.

Transcripts
An application for a transcript must be accompanied by the proper fee. First transcript, no charge; additional copies, each original, $3.00; extra copies, $.50 each. No transcript will be issued until all charges owing to the University have been paid

Scholarships
Scholarships awarded by King's College will normally be applied to charges at King's. If a student has a larger scholarship than his obligation to King's, the balance may be paid by King's to Dalhousie University towards tuition fees. The student should enquire at the Bursar's Office to ascertain if the Dalhousie Business Office has been informed of the arrangement.

Student Photograph
At time of first registration at King's each student will be asked to supply two pictures.

Parking on the Campus
Each student who has a car on campus may obtain a parking permit from the General Office upon the presentation of insurance and license number for a charge of $30.00.

Students with motorbicycles may obtain parking permits under the same conditions for a charge of $30.00, and will be required to park them in a designated area.

Refund of Fees

In any course in which the registration is limited, the first installment of fees is not refundable except on compassionate grounds (e.g. illness). In all other courses refunds may be made under certain conditions set out below. No refunds or rebates of charges for session will be made to students withdrawing after the end of January.

Non-attendance at classes does not constitute withdrawal
A student who registered and wishes to withdraw must complete the necessary formalities through the Registrar's office before he becomes entitled to any refund or exemption from unpaid fees.

A student who has registered and cancels his registration before the first day of classes will be entitled to a full refund of fees, except those paid as an Admission Deposit.

A student withdrawing within two weeks of the date of commencement of classes will be charged a registration fee only of $25.00.

A student withdrawing after two weeks of the date of commencement of classes will be charged in full for the incidental fees and may receive a refund (or be exempt from unpaid fees as the case may be) of the balance on a proportional basis, calculated in monthly units; a full charge will be made for the month in which the withdrawal is approved, including the month of December.

A student withdrawing in January will be charged the full first installment of fees.

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

For registration by term, or for part-time for term course—
For "Fall" term courses—
A student withdrawing in September will be charged a registration fee only of $25.00.
For withdrawal on any date in the Month of October the charge is one-third of the university fee (plus incidental Fee in full, where applicable).
Full fee is charged if a student withdraws after October 31.

For "Winter" term courses—
A student withdrawing up to January 15 will be charged a registration fee only of $25.00.
From January 15 to February 15 the charge is one-third of the university fee (plus incidental Fee if applicable).
Full fee is charged if a student withdraws after February 15.

A student who is dismissed from the University for any reason will not be entitled to a refund of fees.

Application for a refund or adjustment should be made to the Business Office after the approval of the Registrar has been obtained.

Applications for a refund or adjustment should be made to the Business Office after the approval of the proper authority has been obtained. NB—King's students must report AS WELL to the Bursar, King's College.

Fee for Student Organization

At the request of the King's student body, a fee of $72.00 is collected on enrolment from each student who takes more than one class. This fee entitles the student to the privileges of the various students' organizations and clubs, a copy of the King's College Record and free prescription drugs.

Residence Fees

All residence rates include three meals per day for the duration of the academic year. There are no meal plans which exempt resident students from some meals. In the case of timetable conflicts, students are permitted to obtain a box lunch or an early supper from the kitchen. Non-residents can pay for individual meals at any time, and they can also obtain a full meal plan by arrangement with the Bursar.

No student will be admitted to the King's College Residence who has not paid his room deposit of $100.00. This deposit will not be refunded to anyone who accepts a room after August 15, 1984, or who fails to notify the Dean of Residence or the Dean of Women that he does not intend to occupy the room which he has been assigned before this date.

Students are expected to remain in residence for the whole of the academic year, unless other arrangements have been made with one of the Deans. Students are not free to withdraw at will, and every student who withdraws from residence after occupying a room will lose his caution deposit. In addition, should the student fail to give one of the Deans one month's written notice of his intention to withdraw, he will be fined $100.00.

A complete session is defined for students registered in the Faculty of Arts and Science and the School of Journalism as being from the first day of regular registration to the day of the last regularly scheduled examination in the Faculty of Arts and Science. A graduating resident student may stay in residence without charge after these periods up to and including the last day of Encaenia activities, but will be expected to pay for meals during this time.

In exceptional circumstances a student may seek the permission of the Deans to occupy a room at times other than those specified above. For charges and conditions, students should consult with the Dean of Residence and the Bursar.

Resident students who are not registered at King's College are required to pay the King's College Student Union fee of $72.00. In return for the payment of this fee, resident students not registered at King's become fully active members of the King's College Student Union.

Failure to Pay Residence Fee
Residence Fees for the Fall term must be paid by September 30 of each year. Residence Fees for the Winter term must be paid by January 30 of each year. Students who have not paid these fees by the deadline indicated will be charged a penalty of $40.00 in addition to 18% interest on the unpaid fees.

1. No student may return to residence in the Winter term until his first term residence (and interest) charges are fully paid; the rooms of these students will be reassigned.

2. No student may return to residence after the study break of the Winter term until his second term residence (and interest) charges are fully paid; the rooms of these students will be reassigned.

Expulsion
Each student expelled from residence loses his or her caution deposit of $100.00.

Caution Deposit
On enrolment each resident student is required to make a deposit of $100.00 as caution money to cover damage done to furniture, etc. This amount, less deductions, will remain a credit on the books until the student graduates or leaves, when the balance will be returned by cheque usually during June. No refund in whole or in part will be made until that time. All students in resident are held responsible for the care of furnishings within their respective rooms. Losses or damages incurred during the session will be charged to the caution deposit.

Each year a student, on returning, is expected to make up for the previous year's deductions so that his credit may be maintained at $100.00.

The items above, together with a key deposit of $5.00 and gown rental of $20.00 (gowns for non-resident students are optional), are payable at King's Business Office.

The following schedule shows **Residence Fees and Meal Charges** applicable during the 1983-84 academic year.

RESIDENCE	TOTAL	Residence Fees PREPAID DEPOSIT	MINIMUM PAYABLE AT REGISTRATION	BALANCE JAN. 22 (INCLUDES SERVICE CHARGE)
Single Room and Board (Bays)	$2,930.00	$100.00	$1,800.00	$1,150.00
Single Room and Board (Alexandra Hall)	$2,930.00	$100.00	$1,800.00	$1,150.00
Suite Room and Board (Alexandra Hall)	$3,032.00	$100.00	$1,800.00	$1,132.00
Double Room and Board (Bays)	$2,798.00	$100.00	$1,800.00	$1,018.00
Double Room and Board (Alexandra Hall)	$2,798.00	$100.00	$1,800.00	$1,018.00

GENERAL UNIVERSITY REGULATIONS

All students are required to 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.

Place of Residence of Students
For the purpose of admission to the University the place of residence of a student is the place where he is domiciled. This is normally presumed to be the place (country, province, etc.) where the home of his parents or guardian is located. That place remains unchanged unless he takes steps that satisfy the Registrar that he has established a place of residence elsewhere.

Admission
No person under sixteen years of age is admitted to any class except by special permission of the Senate.

Special Cases: The University will consider for admission students who are lacking the normal high school preparation, provided that the applicant can show (by record, interviews, or possibly by taking additional tests) that his qualifications in other respects are acceptable.

Admission Ad Eundem Statum: Students from other universities desiring to study at King's University may, on producing satisfactory certificates, be admitted with advanced standing and given credit for classes equivalent to those offered by Dalhousie-King's.

Successful candidates for degrees in this University ordinarily are required to complete a substantial portion of their work, including the final year, in the Faculty in question.

Registration
All registered students are required to agree to obey all the regulations of the University already made or to be made, and to pay the required fees and deposits before entering any class or taking any examination.

A student is not eligible to register unless all previous accounts, including fees, library fines, and other fines, to the university have been paid.

Late Registration
Late registration in the Faculty of Arts and Science requires the approval of the Dean of the Faculty.

Withdrawal
See the individual faculty regulations, and the Fee Section.

Tuberculin Test: In the interests of public health in the University, students are encouraged to have a tuberculin test. Facilities for testing are arranged by the University Health Services as a regular part of the Registration Process.

Transcript: A student may receive only an unofficial transcript. Official transcripts will be sent at a student's request to other universities, or to business organizations, on payment of the required fee. If a student so requests, a copy of a medical certificate will be enclosed with the transcript.

Academic Discipline

In the case of students reading for the B.A. or B.Sc. degrees, all matters relating to academic affairs and discipline are the responsibility of the Senate of Dalhousie University, subject to the approval of its Board of Governors. Within the general policies approved by Senate, academic requirements are administered by the Faculty concerned.

In the case of students working towards the B.J. (Hons.) or B.J. degrees, all matters relating to academic affairs and discipline are the responsibility of the Faculty of the University of King's College, subject to the approval of its Board of Governors.

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 because of failure to maintain adequate academic standing, such a student may apply to another Faculty. However, in assessing the application, previous performance may be taken into consideration.

In the case of students reading for the B.A. or B.Sc. degrees, the Dalhousie Senate is charged with the authority to deal with cases of alleged academic offences and delegates this authority to the Senate Committee on Discipline.

Academic offences include such acts as the falsification of records or documents in order to gain admission or credit, cheating or assisting others to cheat in examinations or tests and plagiarism. Alleged offences are dealt with by the Senate Discipline Committee which may impose penalties including the withholding of academic credit or suspension or dismissal of a student from the University.

Plagiarism is considered a serious academic offence which could lead to loss of credit and suspension from the University. Plagiarism may be defined as the presentation by an author of the work of another author, in such a way as to give his or her reader reason to think that the other author's work is his or her own. A student who is in any doubt as to what constitutes plagiarism is urged to discuss the matter with the instructor concerned before completing an assignment.

A student who is alleged to have committed an academic offence shall have the opportunity to be heard by the Senate Discipline Committee, or to answer allegations against him in writing before the Committee makes a finding of the facts or reaches a decision.

On report of a serious breach of the law, or a serious academic offence deemed by the President, or in his absence by the 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.

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 from any Faculty of the University.

The same rules apply to students working towards the B.J. (Hons.) or B.J. degrees except that, in these cases, the Faculty of King's College stands in the place of the Dalhousie Senate and the Faculty Committee on Discipline stands in the place of the Dalhousie Senate Committee on Discipline and subject to these reserved powers in the Director of the School of Journalism. Moreover, unprofessional conduct such as faking a story, is treated, like plagiarism, as a serious breach of academic discipline which may constitute grounds for instant dismissal. Likewise, on report of a serious breach of law, or a serious academic offence deemed by the President of King's, or in his absence by the Vice-President, to affect vital University interests, a student involved may be temporarily suspended and denied admission to classes or to the University by the President or Vice-President, but any suspension shall be reported to the Faculty of King's, together with the reason for it, without delay.

From time to time the Faculty may wish to interview students of the University concerning their marks or academic performance. After the Christmas marks have been released, the Faculty will endeavour to see all freshman students on an individual basis. Students are required to keep all appointments made with them by members of Faculty concerning their academic performance.

General Discipline

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.

The maintenance of discipline is the responsibility of the Deans, the Dons, the Residence Councillors, the Wing Monitors and the Campus Police, all having fining powers for unbecoming or unseemly behaviour.

The final authority and the highest body of appeal in the College for disciplinary matters is the College Board. Its composition is the Dean of Residence, the Dean of Women, the President of the Students' Union, the Chairman of the Bays' Residence Council, the House President of Alexandra Hall, three professors elected by Faculty, and the President of the University, who is the Chairman of this body. The President calls this body together at his discretion, and he decides which disciplinary matters merit an appeal before the College Board.

While the students exercise a large measure of self-government in maintaining good order and discipline in the residences, the College reserves the right to fine, suspend, or expel in extreme cases. The Presidential authority to expel from residence is delegated to the Dean of Residence.

In keeping with the traditions of the College, students are expected to wear gowns when attending Chapel, when seated for formal meals, and when calling upon the President of the University. Gowns may be obtained from the Deans.

Students are expected to attend lectures and laboratories regularly and punctually and to perform all exercises assigned by the Faculty.

Dons, the Dean of Residence, the Dean of Women, the Chaplain, the Registrar, the Bursar, the Faculty, and the President are willing to help, counsel, and advise any student at any time, and will act as much as is within their power in the best interest of the students and the College.

Conferring of Degrees, Diplomas, etc.

To gain credit, a student must settle all obligations to the University with respect to tuition and residence fees, bookstore debts, library fines, etc. (not later than April 1 for Encaenia, or September 15 for Fall Convocation).

Successful candidates for degrees are ordinarily required to appear at Encaenia in the proper academic costume to have the degree conferred upon them. However, any student may elect to have his degree conferred in *absentia* by giving formal notice to the Registrar with payment of the required fee before the date specified.

Dalhousie Libraries

King's students enjoy the same privileges in the Dalhousie Libraries as Dalhousie students. For regulations and hours see the current Dalhousie Calendar.

GENERAL FACULTY REGULATIONS

Changes of Regulations usually become effective upon publication in the Calendar. Students are subject to changes in regulations and courses made after their first registration unless specifically excused by the Faculty. All enquiries about the regulations hereunder should be made to the Registrar. Any students suffering *undue hardship* from application of any of the regulations may appeal for relief through the Registrar to the Committee on Studies at Dalhousie.

1. General

Admission to Classes
Students shall not be admitted to class until they have satisfied the regulations regarding entrance and complied with the *General University Regulations.* Students should refer to the Almanac at the beginning of this calendar for the dates upon which classes may be added or deleted. Students who do not register at the proper time are warned that late penalties will apply and, in addition, late admission to classes in which enrolment is limited may not be granted. Students who wish to add classes after two weeks from the commencement of the term in which the class begins must get the approval of the chairman of the department, as well as the approval of the class instructor, and pay a fee of $5.00 for each class added.

Duration of Undergraduate Studies
Students are normally required to complete their undergraduate studies within ten years of their first registration. This rule applies to transfer credits as well. The appropriate Faculty Committee in the Faculty concerned may grant permission to continue studies beyond this period subject to conditions specified by the Committee, with the stipulation that the student must meet the degree requirements in force at the time the extension is granted.

Auditing
Full-time Arts and Science students registered at King's College may, with the permission of the instructor concerned, audit any class in the Faculty of Arts and Science, provided that it is clearly understood that they will not be eligible to write examinations in the class and will not in any circumstances be granted credit for it.

Students in an audit class who wish to change to credit status for that class must follow the procedure laid out under *Audit Students* in the *Fees and Charges* section of the Calendar.

Advanced Placement
A student possessing advanced knowledge of a subject, which he has acquired otherwise than at a university, will be encouraged to begin his studies in that subject at a level appropriate to his knowledge, as determined by the department concerned, and will be exempted from any classes which are normally prerequisites for the one to which he is admitted. However, the student must substitute for the exempted classes an equal number of other classes, not necessarily in the same subjects (i.e., he must complete at the University the full number of classes required for a general or an honours degree). *Advanced knowledge of a subject is not to be confused with transfer credits from another university. Advanced knowledge grants exemption for a past class but requires substitution of another. Transfer credit gains credit for a class but does not require substitution.*

Counting of Classes toward Two Undergraduate Degrees
A student who holds one undergraduate degree from Dalhousie-King's and who wishes to gain a second undergraduate degree must fulfill the requirements of the second degree and meet the following stipulations:

(a) only classes that are applicable to the course for the second degree may be counted for credit;
(b) each class carried forward must bear a grade of C or higher;
(c) a minimum of six new full credit classes must be taken, four of which must be above the 100 level in a new area of concentration and two normally in other subjects;
(d) merit points must be scored on the new classes as required by regulations 3 below;
(e) Application must be made to the Registrar of Dalhousie prior to enrolling in any of the six classes which constitute the minimum additional requirement. This application must give details of the proposed programme and must be supported by the new major department.

A student who holds one undergraduate degree from another recognized university and who wishes to gain a second undergraduate degree from Dalhousie-King's University, must complete at least half of the classes for that degree at Dalhousie-King's. Accordingly, the student must meet the requirements set out in (a) above but must take a minimum of seven and one half full credit classes, at least four of which must be above the 100 level in a new area of concentration, and at least two in other subjects.

Note: Conversion of a General degree to an Honours degree (Degree Programmes, section 5.3.3.) does not involve the award of a second degree; hence it is not subject to this regulation. However, graduates from other universities wishing to obtain an Honours degree from Dalhousie-King's must satisfy all Dalhousie-King's requirements for degrees.

Concurrent Registration at University of King's College and Another Educational Institution
Ordinarily no student may register at Dalhousie-King's if concurrently taking work in another educational institution. A student who wishes to register despite this rule must make special application to the Registrar and therewith provide a description of the classes.

Forced Withdrawal Consequent on Unsatisfactory Performance
Students whose work becomes unsatisfactory will have their cases discussed by the Committee on Studies which may require them to withdraw from the class or classes concerned and to be excluded from the relevant examinations, or may advise them to withdraw temporarily from the University or to reduce their class load.

2. Credit and Assessment

A full credit class is one which typically meets for two or three lecture hours weekly, with possibly tutorial and laboratory periods in addition, throughout the regular academic year. Half-credit classes, etc., require proportional amounts of work. Credits may be obtained for university-level studies

(a) normally during the regular academic year; or exceptionally
(b) during a summer session or by correspondence,
(c) by transfer from other universities attended prior to entrance to University of King's College,
(d) in other Faculties of Dalhousie, or

(e) at other institutions while registered at Dalhousie-King's.

Regulations governing each of these ways of earning credit are presented below in sections 4 through 8.

Gaining Credit
To gain credit toward a degree, a student must meet the requirements relevant to that degree and must appear at all examinations, prepare such essays, exercises, reports, etc. as may be prescribed and, in a class involving field or laboratory work, complete such work satisfactorily.

Credit Contingent on Settling Debts to the University
To gain credit, a student must settle all obligations to the University with respect to tuition and residence fees, bookstore debts, library fines, etc. (not later than April 1 for spring convocations) or September 1 for fall convocations.

Method of Assessment
In determining pass lists, the standings attained in prescribed class exercises, in field or laboratory work, and in the various examinations, may be taken into consideration by an instructor. Within two weeks of the first meeting of a class, each instructor shall make available a written description of the method of evaluation to be used in this class including information in the availability of a supplemental examination and the proportion of the grade to which such an examination would apply within four weeks after the beginning of each term the departmental chairmen must report to the Dean the method of evaluation to be used by each instructor in each class.

Grades
A letter grade system is used to evaluate performance. Grades in the A range represent excellent performance, grades in the B range represent very good performance, and those in the C range represent satisfactory performance. A grade of D represents marginally acceptable performance except in programmes where a minimum grade of C is specified. See the calendar entry for specific programmes. F and FM indicate failure, marginal in the case of FM.

Submission of Grades
On completion of a class, the instructor is required to submit grades to the Registrar, such grades to be based on the instructor's evaluation of the academic performance of the students in the class in question. Christmas grades must be submitted to the Registrar in 1000-level full-year classes with enrolments in excess of 25 (on October 1); Christmas grades are normally submitted in other full-year classes.

Incomplete
Each student is expected to complete class work by the prescribed deadlines. Only in special circumstances may an instructor extend such deadlines. Incomplete work in a class must be completed within four weeks of the required date for submission of grades in that class to the Registrar's Office.

Exceptions to this rule will only be extended to classes which require field work during the summer months. At present the list of these classes consists of Biology 4800 and 4900 and Music 3470C and 4470C. Students taking these classes in their final year should note that they will not be able to graduate at the spring convocation.

Change of Grade
Correction of errors in the recording of a grade may be made at any time, otherwise, changes will only be made as in the "Reassessment of Grades" regulation below.

No student is entitled to appeal for a grade change six months after the required date for submission of grades in that class to the Registrar's Office.

Examinations and Tests
A period of roughly two weeks in the spring and one and one-half weeks in December will be set aside for the scheduling by the Registrar of formal written examinations. An instructor wishing to have an examination scheduled by the Registrar for his class must so inform the Registrar at the beginning of the 3rd week of classes in the fall and spring terms. An instructor may also arrange his own examinations at a time and place of his choosing (including the formal examination periods), but with the understanding that in cases of conflict of examinations for an individual student, the Registrar's examination schedule takes priority. No tests or examinations covering the work of an entire term or year shall be held during the last two weeks of classes in the term. No tests or examinations shall be held during the period between the end of classes and the beginning of the official examination period.

Reassessment of a Grade
On payment of a fee, a student may appeal to the Registrar at Dalhousie for reassessment of a grade in a class. The Registrar will direct the request to the Chairman of the Department concerned, who will ensure that the reassessment is carried out and reported to the Registrar. Written applications for reassessment must be made to the Registrar within two months of the date the grade is sent from the Registrar's Office. Students have a right to view their marked examination papers by appointment for a period of two months from the date the grade is sent from the Registrar's Office. Note that *reassessment* of a grade involves re-evaluation of the required work while *change of grade* also involves correction of errors which do not involve reassessment.

Special Examinations
Special examinations may be granted to students in case of illness, supported by a medical certificate, or in other exceptional circumstances. Medical certificates must be submitted at the time of the illness and will normally be accepted after a lapse of one week from the date of the examination. Students wishing to appear as a candidate at a special examination shall be required to give notice of their intention to the Registrar's Office at Dalhousie on or before January 25 for a fall term or July 10 for a spring term class. Students wishing to write at outside centres must apply by the foregoing dates.

Supplemental Examinations
A student is permitted to write a supplemental examination in one full-credit class or two half-credit classes provided that:
(a) the student obtained a final grade of F/M;
(b) the student has satisfied the requirements for the class (see Regulations);
(c) a single compulsory final examination or test in the class in question accounted for at least forty percent of the final grade (the supplemental examination should—at the discretion of the department—constitute the same proportion of the final grade as did the final examination during the regular session);
(d) the student has not failed the year (See Regulations), or been required to withdraw from the Faculty.

Apart from the case of "A" classes (given in the fall term), the supplemental examination must be written in August immediately following the failure. For "A" classes, supplemental examinations must be written in February immediately following the failure. Supplemental examinations may not be deferred. Notice of intention to write, together with the required fee, must be presented to the Registrar's Office, Dalhousie, by July 10th for supplemental examinations to be written in August, and by January 25th for supplemental examinations to be written in February.

A student who fails to pass the supplemental examination can obtain credit for that class only by repeating it.

No student may write both a supplemental examination and an examination at the end of the Summer School in the same class in the same year.

No supplemental examinations are allowed for classes taken at Summer School.

No more than five full credit (or equivalent half-credit) passes obtained as a result of supplemental examinations may be counted toward a degree.

Repetition of Classes not Passed
Except as provided in Regulation above, a student can gain credit only by repeating a class which he has not passed.

3. Merit/G.P.A. Points and Minimum Standing

For details of Merit Points, Minimum Standing or Grade Point Averages, see the sections under individual Faculties.

4. Regular Academic Year

Workload
Five full credit classes (or the equivalent) per academic year shall be regarded as constituting a normal workload for a student, and may not be exceeded without written permission from the Committee on Studies. Applications from students who have strong reason for wishing to take an overload, and who in their previous year completed a full programme in good standing, will be considered. Such permission will not normally be granted to any student in his/her first year of study, or to any student who, in the preceding academic year, earned fewer than ten merit points. In no case will the workload exceed six classes per term. Applications from students who were part-time during the preceding year will be considered if they have completed at least five classes and earned an average at least two merit points per class.

Required Withdrawal
Any student who has accumulated more failures than the number of merit points earned (see Regulations on merit points in Arts and Science), is required to withdraw from the Faculty. This regulation applies once students have taken four full-credit classes (or the equivalent) after admission or readmission (see below).

Note: "Taking a class" means remaining enrolled in that class after the final date of withdrawal without penalty.

Readmission After Required Withdrawal
Students who have been required to withdraw from the Faculty of Arts and Science may apply to be considered for readmission. Students who have twice failed their year or who have been required to withdraw twice will be ineligible for readmission to the Faculty as either a full-time or a part-time student. Ordinarily an appeal is allowed only if illness has seriously interrupted the student's studies and this is established by submission to the Registrar of a medical certificate from the physician attending the student at the time of the illness.

Repeating Classes for Which a Passing Grade has been Awarded
With the permission of the department concerned and the endorsement of the appropriate committee of the respective Faculty, students 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 the higher grade, or point count appropriate to it, will be used for degree purposes.

5. Off-Campus, Summer School and Correspondence Classes

Students should make application for Summer School as early as possible in order that they may make necessary arrangements and obtain a list of the textbooks required.

Limits on Credits
In all cases, off-campus, Summer School, and Correspondence classes must have been passed at an adequate level and can be accepted only if they are closely equivalent in content to classes normally given at Dalhousie.

In Arts and Science up to three full credits from off-campus classes and up to five full credits from Summer School and correspondence classes may be accepted towards the requirements for a degree. No more than two full-credits (12 credit hours) may be by correspondence.

Maximum Workload
Students may not take classes totalling more than one full credit in any one summer session (nor may the workload in any one week exceed one-sixth of a credit). Not more than two full credits can be obtained at Summer School in any one academic year. Exemptions will normally be granted by the appropriate committee of the Faculty concerned only in respect to attendance at a university which operates a trimester system or its equivalent. In all cases, permission to exceed the maximum workload must be obtained in advance, following the procedures detailed below.

Credit for Summer School Classes at Other Institutions
Students wishing to take, at a university other than Dalhousie, a Summer School class to be counted for credit towards a Dalhousie degree must comply with Regulation 8 below.

Correspondence Classes
A regulation similar to the above relates to correspondence classes and, at the present time, only the correspondence classes offered by Queen's University, Kingston, Ontario will be considered.

6. Transfer Credits

Upon receipt of an application for admission to this University, and an official transcript, students will be advised of the number of credits which may be transferred from another university. However, provisional assessment can be made on interim transcripts. See also the regulation relating to **Duration of Undergraduate Studies** and those sections of individual faculty regulations relating to counting of classes towards two undergraduate degrees, and **Admission Requirements,** for further details.

7. Credits from other Faculties

A student taking classes in another Faculty as part of an affiliated course must conform to the regulations of that Faculty with respect to these classes.

8. Credits from other Universities under Concurrent Registration

Students while registered at Dalhousie/King's, wishing to take classes at another institution, must make an application to the Registrar at Dalhousie and provide a description of the classes offered at the other institution. The workload at the other institution must conform to Regulations 4 and 5 above. A letter of permission will be provided if approval for the classes is given. The departments of French, German, Russian, and Spanish have special arrangements whereby up to a total of 5 full-credit classes taken at other universities may be considered as part of a student's major programme at Dalhousie. See also *Regulation on Concurrent Registration at Dalhousie-King's* and another Educational Institution.

The class fee will be paid by Dalhousie if:
(a) the student is registered as a full-time student at Dalhousie.
(b) the classes are approved as part of the student's programme.
(c) the class is **not** part of a summer school programme.

The class fee will be paid by the student if registered as a part-time student at Dalhousie, or if the class is not part of the Dalhousie programme.

9. Change of Registration

Changing a Class
Class changes will not be permitted during the first week after commencement of classes in any session. Students should decide during the first week of classes what changes they wish to make and make these changes during the second week of classes (see below). Deadlines for class changes appear in the Almanac at the front of this calendar. Students must complete the appropriate registration change form which must be approved by the instructors of the classes concerned and by the Registrar.

Adding Classes
The last date for adding classes is two weeks from the commencement of the term in which that class begins, except in special circumstances in which case a fee will be charged. See Regulation 1, *Admission to classes*.

Withdrawing from Classes
(a) The last day for withdrawing from a class without penalty is published in the Almanac at the beginning of this calendar. Classes dropped after these dates are recorded as W (withdrawal). Students must complete the appropriate registration change form which must be approved by the instructors concerned, the faculty advisor, and by the Registrar. The effective date for withdrawal is the date of submission of the registration change form to the Office of the Registrar. After these dates all classes for which a student remains registered will be recorded.
(b) No class may be dropped after the last day of classes in the term in which that class ends.
(c) Classes may not be added to replace withdrawn classes after the second week of the term in which that class begins (see Regulation), *Adding Classes*.
(d) A student may not transfer from full- to part-time status by withdrawing from classes after the deadlines listed (in the Almanac).

Withdrawing from the University or Changing to Part-time Status
Students wishing to withdraw from the University, or one who wishes to change from full-time to part-time status, must write to the Registrar at King's explaining their circumstances. Students should not discontinue attendance at any class until their application has been approved. Students proposing withdrawal will normally be invited to discuss their situation with the Registrar at the University of King's College and, where appropriate, with the Director of the Foundation Year Programme. Non-attendance, by itself, does not constitute official withdrawal. In the case of total withdrawal, all students must hand in their I.D. cards or pay a 10.00 fee, if it has been lost.

Non-attendance, by itself, does not constitute official withdrawal.

10. Experimental Classes

Experimental classes, on any subject or combination of subjects to which the arts and 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 of 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 classes may be of one-year length or half-year length.

A class shall be held to be formed when at least one faculty member and at least eight students have committed themselves to taking part in it for its full length, and in the case of one-half year classes when a class in the other one-half year is available.

Classes may be formed any time before the end of the second week of classes in the Fall term to run the year or first half year, or any time before the end of the second week of classes in the Spring term. If they are formed long enough in advance to be announced in the Calendar, they shall be so announced, in a section describing the Experimental Programme; if they are formed later, they shall be announced (a) in the Dalhousie Gazette, (b) in the University 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. It shall be his responsibility (a) to advise the Curriculum Committee of the formation and content of the class; (b) to obtain from the Curriculum Committee a ruling as to what requirement or requirements of distribution and concentration and credit the class may be accepted as satisfying; (c) to report to the Registrar on the performance of students in the class; and (d) to report 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).

A student may have five one-year experimental classes (or some equivalent combination of these with half-year length classes) counted as satisfying class for class any of the requirements for the degree, subject to the rulings of the Curriculum Committee (above) and (where relevant) to the approval of the departments.

11. Grievance Procedure

Students wishing to appeal a decision based on the Faculty Regulations shall follow the grievance procedure of the Faculty. If students feel that a just conclusion has not been reached at this level, the appeal must be taken to the appropriate committee. Such an appeal must be addressed in writing to the Committee Chairman and must clearly state the arguments and expectations of the petitioner.

12. Important Notice to Students

In addition to the above Faculty Regulations, students are reminded that they must also comply with the *General University Regulations*. Particular attention is drawn to the University Regulation which refers to PLAGIARISM.

GENERAL ACADEMIC REGULATIONS—SCHOOL OF JOURNALISM

Applicability of General Regulations, School of Journalism

Students registered at the University of King's College as candidates for the B.J. (Hons.) and B.J. degrees are subject to the General Regulations, School of Journalism, and not to the Faculty Regulations of the Faculty of Arts and Science. Students taking classes in the Faculty of Arts and Science must, however, conform to the General Faculty Regulations of the Faculty of Arts and Science with regard to these classes.

Changes of Regulations usually become effective upon publication in the Calendar. Students are subject to changes in regulations and courses made after their first registration unless specifically excused by the Faculty. All enquiries about the regulations hereunder should be made to the Registrar. Any students suffering from undue hardship from application of any of the regulations may appeal for relief through the Registrar to the Journalism Studies Committee, University of King's College.

1. General

Admission to Classes
No student shall be admitted to a class until he has satisfied the regulations regarding entrance and complied with the General University Regulations. Students who wish to add classes after two weeks from the commencement of the term in which the class begins would have to get the approval of the Director of the School of Journalism, as well as the approval of the class instructor.

Duration of Studies
A student in the Bachelor of Journalism (Honours) programme will normally complete his/her studies within four years of first registration. All requirements for the degree must be complete within ten years of first registration. A student in the Bachelor of Journalism programme is normally required to complete his/her studies within one calendar year of first registration.

Auditing
Interested persons may audit courses in the School of Journalism on permission of the Director. The University of King's College reserves the right to charge fees for the auditing of courses in the School of Journalism.

Advanced Placement
A student possessing advanced knowledge of a subject, which he has acquired otherwise than at a University, will be encouraged to begin his studies in that subject at a level appropriate to his knowledge, as determined by the School of Journalism, and will be exempted from any classes which are normally prerequisites for the one to which he is admitted. However, the student must substitute for the exempted classes an equal number of other classes, not necessarily in the same subjects (i.e., he must complete at the University the full number of classes required for a B.J. (Hons.) or B.J. degree).

Concurrent Registration at University of King's College and Another Educational Institution other than Dalhousie
Ordinarily no student may register at the University of King's College in the School of Journalism if concurrently taking work in another educational institution. Regulation 7 below outlines procedures to be followed to secure waiver of this general regulation. Regular exceptions are made with respect to registration at affiliated institutions other than Dalhousie.

In-Course Requirements for continuing in the B.J. (Hons.) degree programme and the B.J. degree programme
In order to be assured of maintaining their places in the B.J. (Hons.) programme, students must achieve at least a C+ average in the journalism writing programme (those courses based upon reporting and editing assignments) and a minimum average overall of B–.

The one-year B.J. programme, because it is intensive and accumulative, will be conducted on a semester system and in order to be assured of maintaining their places from one semester to the next, students must achieve the same standards as above.

Degree Requirements - Writing Courses
In both the B.J. (Hons.) programme and the one-year B.J. programme students must achieve at least an overall C+ average in writing programmes to receive their degrees.

Forced Withdrawal Consequent on Unsatisfactory Performance
When the work of a student becomes unsatisfactory his/her case will be discussed by the Journalism Studies Committee which may require him to withdraw from the class or classes concerned, and to be excluded from the relevant examinations, or may advise him/her to withdraw temporarily from the University, or to reduce his class load.

In-course transfers from B.A. or B.Sc. to B.J. (Hons.)
Provided that a student has successfully completed the Foundation Year Programme, and with a sufficiently high standing, he or she may transfer into the B.J. (Hons.) programme at the end of the first year only. All such transfers are to be made on a space available basis as determined by the limited enrolment policy of the University.

Applications for such in-course transfers from the B.A. or B.Sc. to B.J. (Hons.) programme are made to the Registrar, and applicants must write a letter of application and meet other admission requirements as specified by the School of Journalism.

2. Credit and Assessment

A credit towards a degree is earned in a full-credit class, a class in which typically there is a minimum of two to three lecture hours weekly for the regular (September to May) academic year. Credits may be obtained for university-level studies:

(a) normally during the regular academic year in classes offered by the School of Journalism at King's or in the Faculty of Arts and Science at Dalhousie; or exceptionally
(b) during a summer session or by correspondence,
(c) by transfer from other universities attended prior to entrance to University of King's College,
(d) in Faculties of Dalhousie, other than Arts and Science, or
(e) at institutions other than King's or Dalhousie while registered at King's.

Regulations governing each of these ways of earning credits are presented below.

Gaining Credit
To gain credit towards the B.J. (Hons.) or B.J. degree, a student must meet the requirements relevant to that degree and must appear at all examinations, prepare such essays, exercises, assignments, reports, etc., as may be prescribed.

Credit Contingent on Settling Debts to the University
To gain credit, a student must settle all obligations to the University with respect to tuition and residence fees, bookstore debts, library fines, etc. (not later than April 30 for Spring Convocations).

Method of Assessment
In determining pass lists, the standings attained in prescribed class exercises, in field work, workshops, and in the various examinations, may be taken into consideration by an instructor. Each instructor must ensure that students are informed of the method of evaluation to be used in a class within two weeks of the first meeting of the class. Within two weeks after the beginning of each term, instructors teaching in the School of Journalism must report to the Director on the method of evaluation used in each class.

Grades
The passing grades are A+, A, A–, B+, B, B–, C+, C, C– and D. The failing grades are F/M and F. However, it should be observed (preceding column) that averages required may be above the pass/fail line.

Submission of Grades
On completion of a class, instructors teaching classes in the School of Journalism are required to submit grades to the Director, such grades to be based on the instructor's evaluation of the academic performance of the students in the class in question. Christmas grades are normally submitted in all full-year classes.

Incomplete
Each student is expected to complete class work by the prescribed deadlines. Only in special circumstances may an instructor extend such deadlines. Incomplete work in a class must be completed within four weeks of the required date for submission of grades in that class to the Director's Office.

Change of Grade
Corrections of errors in the recording of a grade may be made at any time. The final date for grade changes for other reasons is September 1 following the academic year; such changes to be made only after the procedures for reassessment of a grade have been complied with.

No student is entitled to appeal for a grade change six months after the required date for submission of grades in that class to the Director's Office.

Examinations and Tests
A period of roughly two weeks in the spring and one week in December will be set aside for the scheduling by the Registrar of formal written examinations. An instructor wishing to have an examination scheduled by the Registrar for his class must so inform the Registrar by October 15 for the Christmas period and February 15 for the Spring period. The School of Journalism will advise the Registrar, on request, of examinations to be scheduled by the Registrar. An instructor may also arrange his own examinations at a time and place of his choosing (including the formal examination periods), but with the understanding that in cases of conflict of examinations for an individual student, the Registrar's examination schedule takes priority. No tests or examinations covering the work of an entire term or year shall be held during the last two weeks of classes in the term. No tests or examinations shall be held during the period between the end of classes and the beginning of the official examination period.

Reassessment of a Grade
On payment of a fee, a student may appeal to the Registrar at the University of King's College for reassessment of a grade in a class. The Registrar will direct the request to the Director of the School of Journalism who will ensure that the reassessment is carried out and reported to the Registrar. Written applications for reassessment must be made to the Registrar within two months of the date the grade is sent from the Registrar's Office.

Special Examinations
Special examinations may be granted to students in case of genuine illness, supported by a medical certificate, or in other unusual or exceptional circumstances. Medical certificates must be submitted at the time of the illness and will normally be accepted after a lapse of one week from the date of the examination. A student wishing to appear as a candidate at a special examination shall be required to give notice of his intention to the Registrar's Office at the University of King's College on or before July 10. Students wishing to write at outside centres must apply by July 10,

Supplemental Examinations
A student is permitted to write a supplemental examination in one class which he failed provided that:

(a) he obtained a final grade of F/M;
(b) he has satisfied the requirements for the class (see Regulations);
(c) a single compulsory final examination or test in the class in question accounted for at least forty percent of the final grade (the supplemental examination should—at the discretion of the—constitute the same proportion of the final grade as did the final examination during the regular session);
(d) he has not failed his year (See Regulations),

Apart from the case of "A" classes (given in the fall term) the supplemental examination must be written in August immediately following the failure. For "A" classes, supplemental examinations must be written in February immediately following the failure. Supplemental examinations may not be deferred. Notice of intention to write, together with the required fee, must be presented to the Registrar's Office, University of King's College by July 10th for supplemental examinations to be written in August, and by January 28th for supplemental examinations to be written in February.

A student who fails to pass the supplemental examination can obtain credit for that class only by repeating it.

No more than one supplemental examination may be written by any student on the work of any one year.

No student may write both a supplemental examination and an examination at the end of the Summer School in the same class in the same year.

No supplemental examinations are allowed for classes taken at Summer School.

No more than five passes obtained as a result of supplemental examinations may be counted towards a degree.

Repetition of Classes not Passed
Except as provided in Regulation above, a student can gain credit only by repeating a class which he has not passed.

3. Regular Academic Year

Workload
Five to five and one-half courses shall be regarded as constituting a normal year's work for a student. (See curriculum for B.J. (Hons.) and B.J. degree programmes.) Applications from students who have strong reason for wishing to take an overload will be considered by the Journalism Studies Committee. Such permission will not normally be granted to any student in his/her first year of study, or to any student who, in the preceding academic year, has failed any class or had two or more class grades below B–. In no case will the workload exceed six classes per term. Applications from students who were part-time during the preceding year will be considered if they have completed at least five classes with grades of B– or better in all classes.

Failed Year
Students who have not passed at least half of the classes for which they are enrolled, and all of their required writing and reporting workshops, after the final date of withdrawal without penalty, will be considered to have failed the year. The results reported in the pass lists of the academic year determine whether students have passed or failed their year.

Penalty for Failed Year
(a) A student who has failed his year for the first occasion is required to reapply to the University for consideration for readmission.
(b) A student who fails a year on two occasions will be ineligible to return to the University as either a full-time or a part-time student. Ordinarily an appeal will be allowed only if illness has seriously interrupted the student's studies and this is established by submission of a medical certificate from the physician attending the student to the Registrar at the time of the illness.

Repeating Classes for which a Passing Grade has been Awarded.
With the permission of the Director of the School of Journalism and the endorsement of the Journalism Studies Committee 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 the higher grade, or point count appropriate to it, will be used for degree purposes.

4. Summer School and Correspondence Classes (Applicable to B.J. (Hons.) Students Only)

Limits on Credits
Up to two credits from Summer School and correspondence classes at King's or Dalhousie may be accepted towards the requirements for a degree. Such classes must have been passed at an adequate level and can be accepted only if they are closely equivalent to courses normally given in the joint Faculty of Arts and Science or the School of Journalism.

Maximum Workload
Normally no student may take classes totally more than one full credit in any one Summer School session where the University offers more than one Summer School session per year. Not more than two full credits can be obtained at Summer School in any one academic year.

Exceptions will normally be granted by the Journalism Studies Committee only in respect of attendance at a university which operates a trimester system or its equivalent.

In all cases, permission must be obtained in advance, following the procedure detailed below.

Credit for Summer School Classes at Other Institutions
A student wishing to take, at a university other than King's, a Summer School class to be counted for credit towards a B.J. (Hons.) degree must:

(a) obtain an application form from the Office of the Registrar at the University of King's College;
(b) obtain from the university he proposes to attend a full description of the Summer School classes (or alternative classes) he wishes to take, usually the Summer School calendar will suffice;
(c) make application to the Registrar of the University of King's College and submit the class description of the class he wishes to take (alternatives should be indicated where possible).

When a decision has been reached, the student will be notified directly by the Registrar. If the decision is favourable, the receiving university will be so advised by the Registrar's Office.

Correspondence Classes
A regulation similar to the above applies to correspondence classes and, at the present time, only the correspondence classes offered by Queen's University, Kingston, Ontario will be considered.

Students should make application for Summer School as early as possible in order that they may make necessary arrangements and obtain a list of the textbooks required.

5. Transfer Credits (Applicable to B.J. (Hons.) Students Only)

Upon receipt of an application for admission to this University, and an official transcript, students will be advised of the number of credits which may be transferred from another university. However, provisional assessment can be made on interim transcripts. See "Transfers" under "Admissions to the School of Journalism".

6. Credits from other Faculties

A student taking classes in the joint Faculty of Arts and Science as part of the B.J. (Hons.) programme must conform to the regulations of that Faculty with respect to these classes, and likewise for classes taken with permission of the Journalism Studies Committee in Faculties other than Arts and Science at Dalhousie.

Each B.J. (Hons.) student must submit to the Journalism Studies Committee by the end of the first year a proposal for a coherent academic programme involving an in depth study of a particular area or discipline for the 4 courses that must be taken in the second year and the 2 courses that must be taken in the third year in the Faculty of Arts and Science. The Committee will advise each student on his/her proposed programme and will approve (with changes where necessary) each student's plan. Any subsequent changes in a student's programme will require the approval of the Committee. See also Regulation 7 in the General Academic Regulation for the School of Journalism.

7. Credits from other Universities under Concurrent Registration

A student, while registered at King's,.wishing to take classes at another institution, must make an application to the Registrar at the University of King's College and provide description of the classes offered at the other institution. A letter of permission will be provided if approval for the classes is given by the Journalism Studies Committee, (see above, Regulation 6).

The class fee will be paid by the University of King's College if:

(a) the student is registered as a full-time student in the B.J. (Hons.) or B.J. programme;
(b) the classes are approved.

The class fee will be paid by the student if registered as a part-time student at Dalhousie-King's.

8. Change of Registration

Changing a Class
Class changes will not be permitted during the first week after commencement of classes in September. Students should decide during the first week of classes what changes they wish to make and make these changes during the second week of classes (see below).

Adding Classes
The last date for adding classes is two weeks from the commencement of the term in which that class begins. Students must complete the appropriate registration change form which must be approved by the instructors concerned, the Director of the School of Journalism and by the Registrar at Dalhousie, for courses taken at Dalhousie and by the Registrar at the University of King's College for courses taken in the School of Journalism.

Withdrawing from Classes
(a) The last day for withdrawing from a class without penalty is: for A classes: 13 November; for B classes; 1 week after study break; for C classes; 27 January; for full year classes; 27 January. Classes dropped after these dates are recorded as W (withdrawal). Students must complete the appropriate registration change form which must be approved by the instructors concerned and by the Registrar.
(b) No class may be dropped after the last day of classes in the term in which that class ends.
(c) Classes may not be added to replace withdrawn classes after the second week of the term in which that class begins (see Regulation).

Withdrawing from the University
A registered student who wishes to withdraw from the University must write to the Registrar at King's explaining his circumstances. The student should not discontinue attendance at any class until his application has been approved. A student proposing withdrawal will normally be invited to discuss his/her situation with the Director of the School of Journalism, the Registrar at the University of King's College and, where appropriate, with the Director of the Foundation Year Programme. Non-attendance, by itself, does not constitute official withdrawal.

9. Transfer from other Colleges and Universities to the School of Journalism (B.J. (Hons.) only)

Deadlines for Receipt of Applications

Canada and the U.S.A.:	April 15
Other Countries	April 15

Applications received after the above dates will be considered, but prompt processing cannot be assured.

Documents to be submitted:

(a) Completed application form (available from Registrar's Office);
(b) Official academic transcripts (or certified copies) from all Colleges and Universities attended;
(c) Copies of calendars (or similar publications) of all Colleges and Universities attended;
(d) Certification of proficiency in English if the native language of the applicant is another language.

Certified copies of original documents, or relevant sections of documents (e.g. calendar pages) are acceptable in lieu of originals. Certificates in languages other than English or French must be accompanied by certified translations into English or French. On receipt of these documents, students will be notified by the Registrar, and are then required to submit a letter of application—the procedure for these two matters is described under, "Admissions to the B.J. (Hons.) degree programme".

Transfer of Credits
Students who have attended a recognized junior college, for at least one year, and can present satisfactory certificates may be granted Senior Matriculation standing provided the work has been done in approved academic courses. For work completed beyond the Senior Matriculation level, credit may be granted on admission for a maximum of five equivalent classes. Students who are admitted under these conditions can complete the requirements to the B.J. (Hons.) degree in three years.

Students who have attended another recognized university may, on presentation of satisfactory documentary evidence, be granted credits for appropriate classes, within the limits of the Regulations set out below.

General Regulations Concerning Transfer (see also General Faculty Regulations).
(a) A student from another college or university who is not eligible for readmission to that college or university on academic grounds will not be admitted to King's College.
(b) No transfer credit will be granted for any class in which a final mark of less than C (or the equivalent) was obtained or for any class in which a final mark was granted conditionally.
(c) A student in the B.J. (Hons.) programme must attend King's as a full-time student in his last two years, unless special permission to the contrary is obtained from the Journalism Studies Committee.
(d) No classes taken at another institution will be counted towards fulfilling the concentration requirement in the Arts and Science or in the Journalism parts of the B.J. (Hons.) degree programme without specific approval from the Journalism Studies Committee.
(e) Transfer credits may be granted only for classes equivalent to classes offered at Dalhousie-King's, and only in subjects

recognized as having standing in a faculty of Arts and Science, or approved classes in Journalism Studies, equivalent to classes offered at King's.
(f) No credit will be given for any classes taken at another university while a student is inadmissable at Dalhousie-King's.
(g) The programme of studies of all transfer students will be subject to approval by the Journalism Studies Committee.

SCHOLARSHIPS, BURSARIES AND PRIZES

Any scholarship winner who can afford to do so is invited to give up all or part of the money awarded. He will still be styled the winner of the scholarship during its tenure. This arrangement increases the value of the scholarship funds as it enables other students of scholarly attainments to attend the university.

All scholarships, prizes and bursaries, except awards to graduating students, will be credited to the student's account and not paid in cash.

No special application forms are required as all students who have been admitted are automatically considered for a scholarship. Students who hope to receive scholarships are encouraged to apply for admission by March 1.

In order to retain scholarships tenable for more than one year, a B average must be made each year, with no failing mark in any subject.

ARTS AND SCIENCE

1. ENTRANCE AWARDS

A. Annual scholarships to the value of $3000, $2500, $1750, $1000 and $500 respectively, provided from various bequests to the university as well as from university funds

The George David Harris Memorial Scholarships—two at $3000. (George David Harris was a student at King's who lost his life by drowning in an attempt to save the life of a friend.)

Established from a bequest of the estate of James R. Harris, these two scholarships are open to competition to all students admitted to the university. The award is based on the record of performance in High School and on qualities of mind and character. Applications and nominations for this scholarship must be supported by High School transcripts, letters of reference and a sample of the applicant's writing. For further details, application and nomination forms, inquire from the Registrar.

Completed applications for the Harris Scholarships should be received by March 31. Final selection may be based on interviews of leading candidates.

Anna H. Cousins bequest, in memory of her husband, Henry S. Cousins, to be known as the Henry S. Cousins Scholarship.

Susanna Weston Arrow Almon bequest, to be known as the Almon Scholarships.

Alumni Association Funds to provide for a number of scholarships, ranging from $2500 to $500, of which one is to be awarded to a student from King's-Edgehill; Rothesay Collegiate; Netherwood or Armbrae Academy.

Dr. Norman H. Gosse, former Chancellor of the University, bequest. This scholarship of $400 is open to a science student entering the Foundation Year Programme.

Alexandra Society Scholarships—The Alexandra Society of the University of King's College provides entrance scholarships, the number of which is determined annually by the Society on a funds-available basis.

Mrs. W.A. Winfield bequest, in memory of her husband.

The Rev. J. Lloyd Keating bequest, to encourage students in the study of chemistry and physics.

B. Scholarships and Bursaries tenable for three years, or for four years if the student takes the Honours Course

Margaret and Wallace Towers Bursary—$1000 a year. Established by Dr. Donald R. Towers, an alumnus of King's, in memory of his mother and father. This bursary, tenable for four years, is open to a student of high academic standing entering the University to study Arts and Science and who is a resident, or a descendant of residents, of Charlotte County, New Brunswick. Failing any qualified applicants from this county in any one year, the bursary for that year only will become available to a student resident anywhere outside the Maritime Provinces of Canada. The holder must live in residence.

King's College Naval Bursary—$300 a year. In order to commemorate the unique and valuable relationship between the University of King's College and the Royal Canadian Navy during the Second World War, ships and establishments of the Atlantic Command have set up a Bursary to enable a student to attend King's.

Applicants must be children of officers and men either serving in the Royal Canadian Navy or retired from the R.C.N. on pension. Academic achievement and promise will be the first consideration in selecting a candidate. Purpose, industry, and character are to be carefully weighed, together with the likelihood that the candidate will make good use of higher education to benefit not only himself but also his country.

The Bursary is awarded annually but it is intended to be tenable by the same student to the completion of his course at King's College provided he makes acceptable progress. The Bursary will be withdrawn in the event of academic failure or withdrawal from King's College for any reason.

The W. Garfield Weston Scholarships. Donated by The W. Garfield Weston Foundation, these awards are given as entrance scholarships to students in either Arts and Science or Journalism.

Imperial Oil Higher Education Awards. Imperial Oil Limited offers annually free tuition and other compulsory fees to all children or wards of employees and annuitants who proceed to higher education courses. The awards are tenable for a maximum of four years, or the equivalent, at the undergraduate or bachelor degree level.

Further information and application forms may be obtained from The Secretary, Committee on Higher Education, Imperial Oil Limited, 111 St. Clair Avenue West, Toronto 7, Ontario.

Alumni Association Memorial Bursary. In 1975 the King's College Alumni Memorial Fund was established with a two-fold purpose. It was to provide an opportunity for gifts to be placed in memory of Kingsmen, staff, students or their friends. Monies received as a memorial are invested and a Book of Memory is established in the Chapel. In it are recorded names of those in whose memory gifts are placed.

The income is to be used as a bursary to assist worthwhile students, over and above scholarships, student aid and/or prize funds.

This Fund is intended for the use of any student registered for a full course of study at King's. It will not necessarily go to students with the highest marks.

Applications for bursary aid may be submitted to the University Registrar.

C. Professional Scholarships

Dr. W. Bruce Almon Scholarship—$1500 a year. Established by the will of Susanna Weston Arrow Almon, this scholarship is open to a student entering the University of King's College and proceeding to the degree of Doctor of Medicine at Dalhousie University. It is renewable yearly provided that the student maintains a first class average, and lives in residence each year until the regulations of Dalhousie Medical School require otherwise. This scholarship is not available to be awarded for the 1984-85 academic year.

By the terms of the will, preference is given to a descendant of Dr. William Johnstone Almon.

Charles Frederick William Moseley Scholarship—$750 a year. Established by the will of Charles Frederick William Moseley, this scholarship is open to a student from regions No. 16 and No. 17 of the Anglican Diocese of Nova Scotia (to be eligible a student must have resided in the areas for at least one year while attending High School) entering the University of King's College as a pre-Divinity student, and proceeding to the degree of Master of Divinity at the Atlantic School of Theology. It is renewable yearly provided that the student maintains suitable academic standing. When no pre-Divinity student is nominated by the Bishop for any one year when the scholarship is available it will be awarded to the highest competitor from the regions as an entrance scholarship for one year only.

James Fear Scholarships—Two scholarships of $1,000 each, annually. Established by the will of Mary L. Fear in memory of her husband James Fear, a graduate of the University of King's College, two scholarships of $1,000 are awarded to students entering the University of King's College as pre-Divinity students and proceeding to the degree of Master of Divinity at the Atlantic School of Theology. They are renewable yearly provided that the recipients maintain suitable standing. When no pre-Divinity students are nominated by the Bishop for any one year when the scholarships are available, the Fear Scholarships will be awarded as entrance scholarships for one year only.

Hazen Trust Scholarships. Two scholarships of $1,000 annually for students entering King's from New Brunswick High Schools as Pre-Divinity students as officially certified by the Diocese of Fredericton.

These scholarships to be retained during the years necessary to complete their degrees at King's and at the Atlantic School of Theology, provided their grades at each institution are satisfactory to the Scholarship Committee, that is, an average no lower than B.

If in any one year, one or both of these scholarships is (are) not so held, such scholarship (or scholarships) will be available for one year only to a qualified student (or students) from the Diocese of Fredericton already registered at the Atlantic School of Theology, provided a nomination by the Diocese, or an application from the student, is made to the Scholarship Committee.

Failing the making of an award (or awards) according to provisions 1, 2 and 3, the scholarship (or scholarships) will be available to qualified students entering King's from New Brunswick High Schools as an entrance scholarship (or scholarships) for one year only.

D. Restricted and Regional Scholarships and Bursaries

Nova Scotia Teachers College Bursary—$500. Awarded on the recommendations of the Principal to a graduate of Nova Scotia Teachers College who registers as a full time student in the Faculty of Arts and Science.

Deihl Bridgewater Bursary—$400. To assist needy students of suitable standing, resident in the town of Bridgewater, or within six miles of the town. Bequeathed by the late Lena Ruth Deihl.

I.O.D.E. Bursaries, value $100 to $300. Awarded to entering students who show academic ability and financial need. Address applications to Provincial Education Secretary, Provincial Chapter, I.O.D.E., Roy Building, 1657 Barrington St., Room 505, Halifax, N.S. B3J 2A1. Applications open March 1, close May 1.

The Halifax Rifles Centenary Scholarship—$200. Established by the Halifax Rifles as an entrance scholarship. For particulars, apply to the Registrar.

Lois Hudson Bursary—$150. Established by a bequest from the estate of David W. Hudson in memory of his sister, Lois Hudson, as an entrance bursary to a woman student in need of financial assistance.

Charles E. Merrill Trust Scholarship. This entrance scholarship of $2,000 is to be awarded each year to a suitably qualified student of high standing from New England.

11. SECOND, THIRD AND FOURTH YEAR AWARDS

A. Annual scholarships of $2000, $1500, $1000, $800 and $500 respectively, provided by the bequests listed above and from university funds

B. Restricted Scholarships

The Honorable Ray Lawson Scholarships—$600 and $400. Established through the generosity of the Hon. Ray Lawson, Chancellor of the University 1948-56, two scholarships of $600 and two of $400 are awarded to students entering their second year.

The Stevenson Scholarship—$120. Founded by the Rev. J. Stevenson, M.A., (sometime Professor of Mathematics), this scholarship of $120, tenable for 2 years, will be awarded to a student with the highest average on the five best subjects in the first year examinations.

Alexandra Society Scholarship—$500. An annual award offered by the Alexandra Society of King's College to a woman student who stands highest in the second or third year examinations. If the student who stands highest holds another scholarship, the award shall be left to the discretion of the Scholarship committee.

The Claire Strickland Vair Scholarship—$300. An annual award to be offered to a student beyond the first year who displays excellence in English; an English Major or English Honours student preferred.

Saint John University Women's Club Scholarship—$100 (Undergraduate). The Saint John University Women's Club awards a scholarship of $100 each year to a woman student entering her senior year in a Maritime University. The award is made to a student from the City or County of Saint John, with the consideration being given to both academic attainment and financial need. For particulars apply to the Registrar, before March 1.

The United States Scholarship—$500. Awarded annually by Friends of King's College of New York, to a continuing student who is a citizen of the United States, and who in the judgement of the Directors of the Corporation best exemplifies an appreciation of the importance of good relationships between the people of the United States and Canada.

In any year the scholarship may be divided among two or more students.

Marion T. Dimick Scholarship Award—Awarded annually by Friends of King's College of New York and made possible through private trust grants. This in-course open scholarship is available for students in Arts and Science and Journalism. Preference is given to a citizen of the United States of America at the discretion of the Scholarship Committee.

Holy Trinity (Yarmouth) Scholarships. Established by the Parish of Holy Trinity, Yarmouth, these awards of varying amounts are to be used for in-course scholarships in Arts and Science and Journalism.

C. Bursaries

Canadian Army Welfare Fund Bursary—A bursary of up to $1000 awarded primarily to finance tuition fees and the purchase of text books to children of Canadian Army servicemen, serving between October 1, 1946, and January 1, 1968. Applications must be received by July 1 each year. For further particulars about how to apply, consult the Registrar.

Walter Lawson Muir Bursary—$175. Endowed by Mrs. W.L. Muir. To be awarded at the discretion of the Scholarship Committee to a student returning to college who won high scholastic standing in the previous year.

E. Mabel Mason Memorial Bursary—$200. Available to women students in need of financial assistance, as a single bursary of $200, or two bursaries of $100 each.

Roy M. Haverstock Bursary—$225. Established by a bequest of Gertrude H. Fox in memory of her brother, Roy M. Haverstock.

Khaki Bursary—$60. Awarded to the sons and daughters of the soldiers of the Great Wars. Written application must be made to the Registrar showing claim for consideration.

The Binney Bursary—$50. Founded in the year 1858, by Miss Binney, sister of the late Bishop Binney, and daughter of the late Reverend Hibbert Binney, in memory of her father.

This bursary is intended to aid students who may require assistance, and who shall have commended themselves by their exemplary conduct.

Charles Cogswell Bursary—$20. Charles Cogswell, Esq., M.D., made a donation of $400 to the Governors of King's College, the object of the donation being "to promote the health of the students and encourage them in the prosecution of their studies".

The Jackson Bursary—$25. Founded by the Rev. G.O. Cheese, M.A. (Oxon.), in memory of his former tutor, the late T.W. Jackson, M.A., of Worcester College, Oxford.

University Bursaries—A limited number of other small bursaries are available to students in need of financial assistance.

D. Prizes

The Lawson Prize—$100. Established by The Hon. Ray Lawson, former Chancellor of the University, for the student who shows the greatest progress between the first and second year.

Dr. M.A.B. Smith Prize—$25. Established by a bequest of $500 from the late Dr. M.A.B. Smith. Awarded to the student with the highest marks at the end of his second year with ten classes. In case of a tie, preference will be given to a pre-Divinity student.

Bishop Binney Prize—$20. This prize, which was founded by Mrs. Binney, is given to the undergraduate with the best examination results at the end of the second year with ten classes.

The Akins Historical Prize—$100. Founded by T.B. Akins, Esq., D.C.L., Barrister-at-Law and Commissioner of Public Records.

The award is made for the best original study in Canadian History submitted in competition.

Essays must be handed in, under a nom de plume, with the writer's name in an attached envelope, on or before the 1st day of April of the year concerned. Essays become the property of King's College.

The Beatrice E. Fry Memorial Prize—$50. Established by the Diocesan Board of the W.A. of the Diocese of Nova Scotia, in memory of Miss Beatrice E. Fry. To be awarded to the woman student (Anglican) of the College obtaining the highest mark of the year in English 100, provided that mark is at least B.

The Henry D. deBlois English Prize—$50. The late Rev. Henry D. deBlois, D.C.L., a graduate of King's College, left the sum of $200 to the Governors of the College to establish a prize in English. Awarded to the student of the 2nd, 3rd or 4th year in Arts or Science who submits the best essay on some subject relating to English Literature.

For conditions, apply to the Registrar. All essays must be in the hands of the Registrar of King's College by April 15.

The Almon-Welsford Testimonial Prize—$30. The Honourable William J. Almon, Esq., M.D. (1816-1901) and his family endowed a prize to commemorate the gallant and loyal deeds of Major Augustus Frederick Welsford who died in the Crimean War (1855) and to encourage the study of Latin. The prize is awarded annually to the student in his first year who makes the highest mark in a Latin course at the 100 or 200 level provided the grade is at least B.

The McCawley Classical Prize—$35. Established as a testimonial to the Rev. G. McCawley, D.D., on his retirement from the office of President. This prize is awarded annually to the student who makes the highest mark in a Greek course at the 100 level providing the grade is at least B.

The Zaidee Horsfall Prize in Mathematics—$10. Established as a memorial to the late Zaidee Horsfall, M.A., D.C.L. Awarded to the student who makes the highest mark in first year Mathematics.

The Harry Crawford Memorial Prize—$40. Offered annually by a friend in memory of Harry Crawford, son of Thomas H. and Elizabeth A. Crawford, Gagetown, N.B.; a student of this College, who died true to his King and his Country, April 14, 1915, while serving in the Canadian Motor Cycle Corps. The prize is awarded to the student completing the second year Arts course, of good character and academic standing, who in the opinion of the Faculty deserves it most.

III. GRADUATE SCHOLARSHIPS, MEDALS AND PRIZES

The Governor General's Medal. Awarded to the candidate who obtains the highest standing in the examination for the B.A. or B.Sc. degree. Preference will be given to an Honours student.

The Rev. S.H. Prince Prize in Sociology. This prize was made available by a $1,000 bequest under the will of the late Dr. S.H. Prince for annual award to both Dalhousie and King's students.

The Rhodes Scholarship. Tenable at the University of Oxford. Before applying to the Secretary of the Committee of Selection for the Province (which application must be made by November 1), consult the Registrar, King's College.

Rhodes Scholars who have attended the University of King's College

1909 Medley Kingdom Parlee, B.A., '08
1910 Robert Holland Tait, B.C.L., '14
1913 Arthur Leigh Collett, B.A., '13
1916 The Rev. Douglas Morgan Wiswell, B.A., '14, M.A., '16
1916 The Rev. Cuthbert Aikman Simpson, B.A., '15, M.A., '16
1919 William Gordon Ernst, B.A., '17
1924 The Rev. Gerald White, B.A., '23, M.A., '24
1925 M. Teed, B.A., '25
1936 Allan Charles Findlay, B.A., '34
1938 John Roderick Ennes Smith, B.Sc., '38
1946 Nordau Roslyn Goodman, B.Sc., '40, M.Sc., '46
1949 Peter Hanington, B.A., '48
1950 Ian Henderson, B.Sc., '49
1950 Eric David Morgan, B.Sc., '50
1955 Leslie William Caines, B.A., '55
1962 Roland Arnold Grenville Lines, B.Sc., '61
1963 Peter Hardress Lavallin Puxley, B.A., '63
1969 John Hilton Page, B.Sc., '69
1981 Bernard John Hibbitts, B.A., '80

University Women's Club Scholarship—$500. The University Women's Club of Halifax offers a scholarship of the value of $500 every second year, 1982, 1984, etc., to a woman graduate of Dalhousie University or King's College, to assist her in obtaining her M.A. or M.Sc. degree at any recognized graduate school. For particulars, apply to the Registrar.

The Canadian Federation of University Women Fellowships—$1500 to $2500. For information, apply to the Registrar.

JOURNALISM

I. ENTRANCE AWARDS

Annual scholarships to the value of $2500, $1750 and $1000 and $500, provided from bequests to the university as well as from university funds. Applicants to the first year of the Bachelor of Journalism (Honours) programme are eligible to apply for the George David Harris Memorial Scholarships (see p. 30).

Mercantile Bank of Canada Scholarship—$800. One scholarship of $800 to be awarded to a student entering the first year of the Bachelor of Journalism (Honours) programme.

Aetna Casualty/Excelsior Life Scholarship—$800. One scholarship of $800 to be awarded to a student entering the first year of the Bachelor of Journalism (Honours) programme.

Canadian Tire Corporation Scholarship—$500. One scholarship of $500 to be awarded to a student entering the first year of the Bachelor of Journalism (Honours) programme.

The W. Garfield Weston Scholarships. Donated by The W. Garfield Weston Foundation, these awards are given as entrance scholarships to students in either Arts and Science or Journalism.

II. SECOND, THIRD AND FOURTH YEAR AWARDS

Annual scholarships of $2000, $1500, $1000 and $500 respectively provided from university funds.

Marion T. Dimick Scholarship Award—Awarded annually by Friends of King's College of New York and made possible through private trust grants. This in-course open scholarship is available for students in Arts and Science and Journalism. Preference is given to a citizen of the United States of America at the discretion of the Scholarship Committee.

Holy Trinity (Yarmouth) Scholarships. Established by the Parish of Holy Trinity, Yarmouth, these awards of varying amounts are to be used for in-course scholarships in Arts and Science and Journalism.

Major Cecil R. Thompson Prize—$250. Given to the student who achieves the highest grade in Journalism 201.

DIVINITY

Scholarships in Divinity are tenable at the Atlantic School of Theology (or elsewhere in the case of particular scholarships). The Anglican faculty members of the Atlantic School of Theology advise on their disposition. Information on and application for these scholarships should be sought from the Divinity Secretary of King's College, Rev. Canon J.H. Graven.

Owen Family Memorial Scholarships—two of $250. Established by Mr. and Mrs. D.M. Owen, in memory of the Owen family, tenable for one year, but renewable, and open to applicants who are Nova Scotia born, and resident therein, and are or are about to become theological students, preference being given (1) to native residents of the town of Lunenburg, and (2) to native residents of the County of Lunenburg.

Canon W.S.H. Morris Scholarship—$1,500. This scholarship was founded by the late Robert H. Morris, M.D., of Boston in memory of his father, the Reverend Canon W.S.H. Morris, M.A., D.D., Kingsman, Scholar and Parish Priest in the diocese of Nova Scotia for forty years.

The scholarship may be awarded annually by the President and Divinity Faculty to the most deserving member of the present or recent graduating class of the Divinity School, who has been at King's at least two years, and who, in the opinion of the Faculty, would benefit from travel and/or study in Britain, the U.S.A. or some other area outside the Atlantic Provinces of Canada, provided he reaches a satisfactory standard. Applications, stating the use which the applicant expects to make of the scholarship, must be submitted to the Divinity Secretary on or before January 8, of the year in which the applicant, if successful, intends to use the scholarship. The recipient will be required to serve in the Atlantic Provinces for a minimum of three years after his return from abroad.

Charles Frederick William Moseley Scholarship—$750 a year. Established by the will of Charles Frederick William Moseley, this scholarship is open to a student from regions No. 16 and No. 17 of the Anglican Diocese of Nova Scotia (to be eligible a student must have resided in the areas for at least one year while attending High School) entering the University of King's College as a pre-Divinity student, and proceeding to the degree of Master of Divinity at the Atlantic School of Theology. It is renewable yearly provided that the student maintains suitable academic standing. When no pre-Divinity student is nominated by the Bishop for any one year when the scholarship is available, it will be awarded to the highest competitor from the regions as an entrance scholarship for one year only.

James Fear Scholarships—Two scholarships $1,000 each, annually. Established by the will of Mary L. Fear in memory of her husband James Fear, a graduate of the University of King's College, two scholarships of $1,000 are awarded to students entering the University of King's College as pre-Divinity students and proceeding to the degree of Master of Divinity at the Atlantic School of Theology. They are renewable yearly provided that the recipients maintain suitable standing. When no pre-Divinity students are nominated by the Bishop for any one year when the scholarships are available, the Fear Scholarships will be awarded as entrance scholarships for one year only.

Hazen Trust Scholarships. Two scholarships of $1,000 annually for students entering King's from New Brunswick High Schools as Pre-Divinity students as officially certified by the Diocese of Fredericton.

These scholarships to be retained during the years necessary to complete their degrees at King's and at the Atlantic School of Theology, provided their grades at each institution are satisfactory to the Scholarship Committee, that is, an average no lower than B.

If in any one year, one or both of these scholarships is (are) not so held, such scholarship (or scholarships) will be available for one year only to a qualified student (or students) from the Diocese of Fredericton already registered at the Atlantic School of Theology, provided a nomination by the Diocese, or an application from the student, is made to the Scholarship Committee.

Failing the making of an award (or awards) according to provisions 1, 2, and 3, the scholarship (or scholarships) will be available to qualified students entering King's from New Brunswick High Schools as an entrance scholarship (or scholarships) for one year only.

The Alexa McCormick Sutherland Memorial. The sum of $5,000 has been willed to the Board of Governors of the University of King's College by the late Annie M. Smith of Granville Ferry, Nova Scotia, for the purpose of founding a memorial to her mother from the net annual income. The award is open to the Anglican student, including any post-graduate student, in the Divinity School, now a partner in Atlantic School of Theology, considered worthy in terms of scholarship, financial need and devotion to his or her vocation, nominated by the Anglican Faculty Group of Atlantic School to the above named Board of Governors.

The Ernest H. MacDonald Fund. The annual interest of a bequest of $13,878.60 to the Board of Governors of the University of King's College, willed by the late Miriam MacDonald of Bourne, Mass., U.S.A., and administered by the University in the same manner as other endowment funds, is to be used for aid to Divinity students (including post-graduate students) from New Brunswick in the Divinity School, now a partner in Atlantic School of Theology, considered worthy and recommended by the Anglican Group of Atlantic School to the above named Board of Governors.

William Cogswell Scholarship. Open to students intending to work in the Diocese of Nova Scotia.

Scholarship (A): Under the direction of the Trustees of the William Cogswell Scholarship, to be awarded to the student who passes a satisfactory examination and who takes his Divinity course at any recognized Divinity College of the Anglican Church in Canada best fitted, in the opinion of the Trustees, to serve the terms of the Trust.

Scholarship (B): Under the direction of the Faculty of Divinity of the University of King's College, Halifax, Nova Scotia, an entrance scholarship of $200 or $300 depending on quality of work submitted, will be awarded to the properly accredited student entering the Divinity course for the first time and who stands highest in a special examination to be held in the month of admission provided he reaches a satisfactory standard. The recipient will be required to sign a statement promising to serve in the Diocese of Nova Scotia for a period at least as long as the period during which he holds the scholarship.

This examination will consist of two papers:
(a) A paper on the content of the Old and New Testaments; and
(b) A paper on A.H. McNeile's Introduction to the New Testament (revised edition by C.S.C. Williams) Oxford, 1953.

Awards will not be made every year.

The Daniel Hodgson Scholarship—$240. Founded in 1883 by Edward J. Hodgson and the Reverend G.W. Hodgson in memory of their father Daniel Hodgson, who died about that time. This scholarship of an annual value of $60, tenable for four years, is the purpose of encouraging students to take an Arts Degree before entering upon the study prescribed for Holy Orders. Candidates, who must be residents of Prince Edward Island, shall file their applications and certificates of having passed the full Arts matriculation requirements before August 15, and must not be over 24 years of age at that time. They must also satisfy the Diocese Committee for Holy Orders as to their aptitude for the Ministry of the Church. At the end of each academic year the scholar shall file with the Trustees, a certificate from the President or Secretary of the University "that during the past year he has resided in College (or has

been excused from such residence) and has attended the full Arts course in the College'', together with a certificate that his moral conduct, his attention to his studies and his general conduct have been satisfactory to the Board of Governors.

Scholars who fail to comply with the foregoing conditions automatically forfeit the scholarship, but in special cases the Bishop, on the representations of the Trustees, may restore a terminated scholarship in whole or in part.

The Bishop Waterman Bursary (Parish of Clements)—$150. The Parish of Clements, Nova Scotia, wishing to give tangible expression to its appreciation to the Rt. Rev. R.H. Waterman, D.D., for his services to the Parish immediately following upon the death of their Rector (Rev. W.H. Logan, December 19, 1964), has set up a Bursary Fund, to be known as the Bishop Waterman Bursary Fund, to help young men to undergo training for the Ministry. An amount not less than $150 is to be forwarded by the Treasurer of the Parish to the Bursar at King's on September 1 of each year. This money is to be used at the discretion of the Faculty of Divinity in consultation with the Bishop of the Diocese for any assistance of any candidate for Holy Orders needing it from any Parish of the Diocese of Nova Scotia enrolled for training for work in the Diocese of Nova Scotia or any Missionary Diocese. If any young man from the Parish of Clements offers himself for such training, he shall be given first consideration in the awarding of the bursary.

The Mabel Rudolf Messias Divinity Bursary—$120. The interest on an endowment of $2,000, the gift of Mrs. M .R. Messias of Wolfville, Nova Scotia, is to be used to provide an annual bursary for a needy and deserving Divinity student.

Order of the Eastern Star—$300. Four scholarships are to be awarded, primarily on the basis of financial need, to 2nd and 3rd year Arts students, or to older men with their Arts degree, in their 3rd year of Theology.

The H. Terry Creighton Scholarship—$150 approximately. The annual income from an endowment of $2,000 established by family and friends to honour the memory of H. Terry Creighton of Halifax, Nova Scotia, who was an active Lay Reader and prominent Layman of the Diocese of Nova Scotia for many years.

The Scholarship is to be made to an outstanding and deserving Anglican Divinity student at the conclusion of his final year of training and who is intending to enter the ministry of the Diocese of Nova Scotia. Should there be no suitable candidate for the scholarship training in Nova Scotia, the award may be made, in consultation, with the Bishop of Nova Scotia, to one studying elsewhere, provided that the student intends to return to Nova Scotia for ministry in that Diocese.

Mary How Donaldson and Cornwallis W.A. Bursary—$400. This bursary was established by St. John's (Cornwallis, N.S.) Anglican Church Women to provide a living memorial to the life and work of Mary How Donaldson, who had family connections with King's College, and of Cornwallis W.A., of which she was a charter member. It is to be awarded on the recommendation of the Divinity Faculty to a deserving Anglican Divinity student, male or female, preferably a Nova Scotian, who is prepared for full-time service in the Church and is in need of financial assistance.

The George M. Ambrose Proficiency Prize—$300. approximately. The income from a trust fund set up in memory of Canon G.M. Ambrose, M.A., an alumnus of King's, provides an annual award to the Divinity student who receives the highest aggregate of marks at the end of his first year, provided that during that year such student takes the regular full course in theology.

Anderson Scholarships—$450. Two scholarships of the value of $450 each, established under the will of Maple B. Anderson of Lunenburg, Nova Scotia, in loving memory of her brothers, Roseville W. & George M. Anderson, to be used for scholarship purposes for qualified applicants wishing to study theology at the Atlantic School of Theology.

The scholarships are to be awarded annually on the recommendations of the Anglican Divinity professors at the Atlantic School of Theology with the approval of the President of the University of King's College.

A student may apply for renewable tenure of the scholarship.

The Margaret Draper Gabriel Bursary—$450. A fund has been established in memory of Margaret Draper Gabriel by her son, Rev. A.E. Gabriel, M.A., an alumnus of King's, the yield from which is to be used to give financial aid to a Nova Scotian Divinity student in preparation for the Ministry of the Church. The recipient must be nominated or recommended by the Bishop of Nova Scotia. If in any year there is no candidate for this assistance the yearly yield is to be used to augment the fund. Should King's College Divinity School cease to exist as such, the fund is to be transferred to the Diocese of Nova Scotia and the income used as aforesaid.

The Reverend Canon H. Douglas Smith Bursary Fund. A fund of $4,000 has been established by Mrs. Ethel May Smith in memory of her son and King's graduate, the Reverend Canon H. Douglas Smith. The income of the fund is disbursed in the form of bursaries (one or more) to needy and deserving persons from the Diocese of Nova Scotia or the Diocese of Fredericton who are theological students at the Atlantic School of Theology, and who intend to enter the Ministry in one of these Dioceses.

H.H. Pickett Memorial Scholarship—$175. This scholarship is payable to the student entering the final year of study for the Sacred Ministry who has shown the greatest all round improvement during his time in Divinity studies. Preference is to be given, first, to a student from Trinity Church, Saint John, and, second, to a student from the Diocese of Fredericton.

John Clark Wilson Memorial Bursaries—$100 each. Established in 1947 by Miss Catherine R. Kaiser, in memory of John Clark Wilson. Two bursaries of $100 each, tenable for one year. Awarded to Divinity students deemed worthy of financial help.

Glebe Scholarship. A scholarship of approximately $250 is offered annually to Anglican students of Prince Edward Island, preference being given to Divinity students.

Application, accompanied by a certificate of character from the applicant's Rector, must be sent to Canada Permanent Trust Company, Charlottetown, P.E.I. on or before May 31.

Moody Exhibition—$100. The ''Catherine L. Moody'' Exhibition of $50 a year for two years is awarded every two years to the student entering the second year preparing for Holy Orders, whose scholarship and exemplary conduct shall, in the opinion of the Faculty, merit it. (Next award 1985).

The George Sherman Richards Proficiency Prize—$120. In Memory of the Reverend Robert Norwood, D.D. The income from a fund of $2,000 to be awarded annually to the Divinity student who gains the highest aggregate of marks at the end of his penultimate year, provided that in that year he takes the regular full course in Theology.

The Countess de Catanzaro Exhibition—$100. The income from a fund of $2,000 to be awarded by the Faculty to a Divinity student during his second year in college. The award will be made on the basis of character and need.

The McCawley Hebrew Prize—$25. Open to all members of the University who are below the standing of M.A.

This prize is given out of the interest of a Trust Fund, the gift of the Reverend George McCawley, D.D., in the hands of the Society for the Propagation of the Gospel in Foreign Parts.

This prize will be awarded to the student who leads the class in Hebrew 2 and receives a recommendation from the professor of Hebrew.

Junior McCawley Hebrew Prize—$25. With the accumulated unexpended income from the McCawley Hebrew Prize a fund has been set up establishing a second prize, to be awarded to the student standing highest in first year Hebrew.

Archdeacon Forsyth Prize—$50. The Ven. Archdeacon D. Forsyth, D.C.L., of Chatham, N.B. who died in 1933, left to King's College $1,000 to provide an annual prize or scholarship, to be awarded to a Divinity student for proficiency in the study and knowledge of the original Greek Scripture. To be awarded on the combined results of Greek Testament 1 and 2.

Shatford Pastoral Theology Prize—$40. Established by an anonymous donor, in memory of the late Rev. Canon Allan P. Shatford, C.B.E., D.C.L. Awarded annually for Pastoral Theology. The winner must receive a recommendation from the Professor of Pastoralia.

The Wiswell Trust Divinity Studentship—$120. A.B. Wiswell, D.C.L., Hon. Fell. (Vind.) of Halifax, N.S., in order to perpetuate the memory of the Wiswell family, augmented a bequest from members of the family, thus providing a capital sum of $2,500, the income of which is to assist Divinity students who were born in Nova Scotia and who propose entering the Ministry of the Anglican Church in Canada.

Prince Prize in Apologetics—$60. Established by a bequest of the late Dr. S.H. Prince. Awarded every alternate year, at the discretion of the Faculty. (Next award 1985-86).

Wiswell Missionary Bursary—$200. Founded by Dr. A.B. Wiswell for help to a Divinity student who believes he has a call to the Mission Field either Overseas or in the Canadian West.

Preference will be given to a student who has given promise of the needed qualities and has taken his degree or is within a year of completing his Arts course. If there is no student meeting the above requirements the award will be left to the discretion of the Divinity Faculty.

Clara E. Hyson Prize—$5. Founded by Miss Clara E. Hyson and awarded each year on vote of the Faculty.

A. Stanley Walker Bursary—$400. Awarded by the Alexandra Society of King's College. To be given annually to an Anglican student at the Atlantic School of Theology.

Johnson Family Memorial Bursary—$60. Founded by the Misses Helen and Marguerite Johnson in memory of their parents. This bursary is to be awarded annually at the discretion of the President and Divinity Faculty to the Divinity student considered most worthy on grounds not only of scholarship, but also, of financial need and of devotion to his vocation. Preference will be given to a student from the Parish of St. Mark's, Halifax.

Divinity Grants. Grants to aid students in Divinity who require assistance are made by the Bishop of Nova Scotia, and by the Bishop of Fredericton. The holders of these must fulfill such conditions as the Bishops lay down and in every case attend a personal interview. For further particulars, apply to the Divinity Faculty.

Archbishop Kingston Memorial. Awarded annually by the Nova Scotia Diocesan A.C.W. on recommendation of the Divinity Faculty, to a needy divinity student. Several scholarships awarded annually by the Nova Scotia Diocesan A.C.W. on recommendation of the Divinity Faculty to needy divinity students.

The Wallace Greek Testament Prize—$50. A Book Prize established by the late Canon C.H. Wallace of Bristol, England, in memory of his father Charles Hill Wallace, barrister, of Lincoln's Inn, who graduated at King's College in 1823, and died in England in 1845. Subject: Epistle to the Hebrews. Application to be made to the Divinity Secretary by March 1.

Agnes W. Randall Bursary. Two bursaries of $8 each will be given each year to the students in Theology who show the greatest diligence in their studies. An award will not be made twice to the same student.

Bennett-Cliff Memorial Prize. A prize of $10 each year. Award to be at the discretion of the President.

Kenelm Eaton Memorial Scholarship—$60. This scholarship is provided by the Synod of Nova Scotia as a memorial to The Hon. Captain Kenelm Edwin Eaton, B.Sc., L.Th., who made the supreme sacrifice while serving as a Chaplain in Italy, August 31, 1944. For particulars, apply to the Divinity Secretary.

Dr. C. Pennyman Worsley Prize—$100. A memorial to the late Dr. Worsley. To be used in alternate years for a prize in Church History. Next award 1985-86.

Fenwick Vroom Exhibition—$40. To be awarded to a Divinity Student at the discretion of the Faculty.

The Church Boy's League Bursary Fund. Students eligible for assistance from this fund are those who have, at one time, been full-pledged members of any Parochial C.B.L. branch in Canada. Particulars are available from the Divinity Secretary.

Archbishop Owen Memorial Scholarships. A number of scholarships of $300 each are awarded each year by the General Synod Committee concerned, to students in their final year in Theology who are ready to take up missionary work, either in Canada or overseas. Academic standing and financial need are taken into account in making the award.

Application should be made to the Divinity Faculty by November 1 of each year.

The Florence Hickson Forrester Memorial Prize—$100. The prize, presented in memory of the late Mrs. Forrester, by her husband, is to be awarded on Encaenia Day to the Divinity student in his penultimate or final year who passes the best examination on the exegesis of the Greek text of St. Matthew, Chapter V-VII provided always that the standard is sufficiently high.
Bibliography:
T.W. Manson: *The Sayings of Jesus* (SCM)
J. Jeremias: *The Sermon on the Mount* (Athlone Press)
F.W. Beare: *The Earliest Records of Jesus* (Blackwell), pp. 52-69 and 95-98.
H.K. MacArthur: *Understanding the Sermon on the Mount* (Epworth).

The Bullock Bursary—$225. Established by C.A.B. Bullock of Halifax for the purpose of defraying the cost of maintenance and education of Divinity students who were, before being enrolled, residents of Halifax and members of a Parish Church there, and who are unable to pay the cost of such maintenance and education.

The Harris Brothers Memorial—$100. To be awarded at the beginning of each college year as a bursary to a student of Divinity. The student shall be selected annually by the Divinity Faculty, preference being given to a needy student from Prince Edward Island, failing that, a needy student from the Parish of Parrsboro, and failing that, to any deserving student of Divinity.

The Carter Bursaries—$160. Two bursaries of a value of $160 each, established under the will of Beatrice B. Carter of Amherst, Nova Scotia, to be used to assist young men studying for Ministry.

Royal Canadian Air Force Protestant Chapel Bursary—$120. This bursary, established in 1959 by endowment from collections taken in R.C.A.F. chapels, is awarded annually at the direction of the Divinity Faculty to a bona fide ordinand, preference where possible being given to (a) ex-R.C.A.F. personnel, (b) children of R.C.A.F.

William A. and Kathleen Hubley Memorial Bursary—$175. This bursary is designed to assist students from St. Mark's Parish, Halifax, and failing a suitable candidate then from any parish in the Diocese of Nova Scotia, who are studying for the Sacred Ministry at any recognized College in the Anglican Communion, preference being given to students studying at the Atlantic School of Theology. The award is made on the basis of need and may be renewed provided a certain acceptable standard is attained. The recommendations of the Rector of St. Mark's and the Divinity Faculty are necessary conditions. The bursary must be applied for annually.

The Reverend Dr. W.E. Jefferson Memorial Bursary—$100. This bursary, the gift of the Parish of Granville, N.S., is established in memory of Reverend W.E. Jefferson, D.Eng., an alumnus of King's and a graduate engineer, who was ordained late in life and yet was able to give nearly twenty years of devoted service to the ordained Ministry. Preference will be given to older men pursuing post-graduate studies or to older men preparing for ordination. The award is to be made by the Divinity Faculty.

The Archdeacon Harrison Memorial Bursary—$20. Established by Miss Elaine Harrison in memory of her father. To be awarded to a deserving and needy Divinity student, at the discretion of the Faculty.

St. Paul's Garrison Chapel Memorial Prize—$20. To be awarded to the Divinity student chosen by the Faculty to attend a Christmas Conference.

The Clarke Exhibition. An endowment was established by the late Reverend Canon W.J. Clarke of Kingston, New Brunswick, the first charge upon which shall be the provision of copies of *The Imitation of Christ* to members of each year's graduating Class in Divinity. The balance of the income each year to be awarded by decision of the Divinity Faculty to a deserving Divinity Student for the coming year.

Northumbria Region Bursary—$150. Offered annually by the Brotherhood of Anglican Churchmen in the Northumbria Region.

It is awarded to a needy and worthy student from the Amherst region. If no candidate is available from this region, in any one year, then any needy and worthy Anglican student would be eligible.

Canada Student Loans

1. All Canadian students are eligible to be considered for Canada Student Loans which, in most provinces, are administered in conjunction with provincial bursary plans.

2. Students should apply as early as possible by requesting application forms from the provincial authority in order to have the money available for registration.

CONVOCATION 1983

GRADUATING CLASS

LIFE OFFICERS

Honorary President
Donald A. Fry

President
Scott Gilman Emery

Vice-President
Joanne Marie Cadogan

Secretary-Treasurer
Christine Ann Davies

Valedictorian
Christopher George Mitchell

DOCTOR OF CIVIL LAW (honoris causa)
Richard James Doyle . . . . . Toronto, Ont.
Robert Breckenridge Ware MacNeil . . . . . New York U.S.A.
His Honour Judge Peter Nicholson . . Annapolis Royal, N.S.

DOCTOR OF CANON LAW (honoris causa)
Rear Admiral Hugh Francis Pullen . . . . . Halifax, N.S.

DOCTOR OF DIVINITY (honoris causa)
The Reverend Canon Walter Ruggles Harris . . . . Truro, N.S.
The Reverend Professor John Bernard Hibbitts Halifax, N.S.

BACHELOR OF ARTS DEGREE:

BEED, David Gerard . . . . . Dartmouth, N.S.
BLUNDEN, Carolyn Anne . . . . . Halifax, N.S.
BOYD, Laish Zane (Honours in Classics) Nassau, Bahamas
** CHASE, G. Mark . . . . . Milton, Ont.
CLIFFORD, Lori Joan (First Class Honours in Classics) . . . . . Sarnia, Ont.
COLE, Paul Douglas . . . . . Musquodoboit Harbour, N.S.
COPAS, Simon . . . . . Chester, N.S.
CORELLI, Catherine Laura . . . . . Toronto, Ont.
** CUSHING, Deborah Frances . . . . . Yarmouth, N.S.
DAVIES, Helen Lynn (First Class Honours in English) . . . . . Dartmouth, N.S.
EMERY, Scott Gilman . . . . . Westville, N.S.
FEENSTRA, Jennifer Harriet . . . . . Dartmouth, N.S.
FINDLAY, Steven Paul . . . . . Sydney, N.S.
FISHER, Bruce Harold . . . . . Dartmouth, N.S.
FORBES, Alexander MacLean . . . . . Summerside, P.E.I
GALEY, John Addy . . . . . Florenceville, N.B.
GRIFFIN, Pamela Lea . . . . . Halifax, N.S.
HALLETT, Angela Leslie (Distinction) . . . . . Peel, N.B.
HODY, William George . . . . . Lakeburn, N.B.
HOWE, Scott Thomas . . . . . Saint John, N.B.
JANIK, Anthony Paul . . . . . Kingston, Ont.

KENNEDY, Craig Douglas . . . . . Halifax, N.S.
KENNEDY, John Fraser . . . . . Tangier, N.S.
KENNEY, James Scott . . . . . Halifax, N.S.
LAKE, Alison Ruth . . . . . Saint John, N.B.
LEAMON, Ann Kathryn (First Class Honours in German and a University Medal) . . . . . Poland, Maine, U.S.A.
LORIMER, Andrew Thomas Musquodoboit Harbour, N.S.
MacCORMACK, Elizabeth Ann (Honours in History and Philosophy Combined) . . . . Halifax, N.S.
** MacLEAN, Lauchlin Grant . . . . . Dartmouth, N.S.
** MacLELLAN, Mary Lucina . . . . . Sydney, N.S.
** McCARRON, Anna Colleen . . . . . Wallace, N.S.
McPHAIL, Keith Scott . . . . . Comox, B.C.
MILLER, Suzanne Constance . . . . . Rothesay, N.B.
MITCHELL, Christopher George . . . . . Truro, N.S.
** PERLMUTTER, David Calman . . . . . Toronto, Ont.
RAMSEY, Lori Lynn . . . . . North Sydney, N.S.
REAGH, Jane Elizabeth (Distinction) . Charlottetown, P.E.I.
REARDON, Carol Therese (First Class Honours in Political Science and the Eric Dennis Medal) . . . . . Halifax, N.S.
REID, JoAnn Margaret . . . . . Halifax, N.S.
** REY, Amalita . . . . . Dartmouth, N.S.
ROBERTSON, Myles Windsor McGrath . . . . Bedford, N.S.
** SCHELLENBERG, Sara Lynn Elaine . . . . . Dartmouth, N.S.
** SMITH, Cameron Andrew . . . . . Prince William, N.B.
* STEWART, David Lorne . . . . . Halifax, N.S.
TEIMAN, Catherine Frances Millicent . New Glasgow, N.S.
** THOMPSON, Carole MacGregor . . . . . Halifax, N.S.
THOREN, Mary Ingegard . . . . . Dartmouth, N.S.
TUFTS, Peter Duncan . . . . . Halifax, N.S.
vanFEGGELEN, KimRilda . . . . . Halifax, N.S.
WILCOX, William John . . . . . Lunenburg, N.S.
WITHAM, Jennifer Ann . . . . . Dartmouth, N.S.
WITHERS, Paul Thomas . . . . . Halifax, N.S.

BACHELOR OF ARTS—HONOURS CERTIFICATE:

CRAIG, Barry Leigh (Honours in Classics) . . . . . Woodstock, N.B.
EISENHAUER, Thomas Andrew (First Class Honours in Economics and a University Medal) . . . . . Lunenburg, N.S.
EYLAND, Kim Sandra-Marie (Honours in Classics) . . . . . Halifax, N.S.
TUCK, Gertrude Elizabeth (First Class Honours in Classics and a University Medal) Georgetown, P.E.I.

BACHELOR OF SCIENCE DEGREE:

BAINES, Danica Darlene Sonya . . . . New Glasgow, N.S.
BUNGAY, Kimberley Anne . . . . . Moncton, N.B.
CAMPBELL, David Charles (Honours in Biochemistry . . . . . Dartmouth, N.S.
** COOK, Stewart Alexander . . . . . Toronto, Ont.
ERVINE, Carolyn Joy (Honours in Mathematics) . . . . . Lower Sackville, N.S.
** FEINDEL, Darren Aubrey . . . . . Bridgewater, N.S.
FINCK, Philip William (Honours in Geology) . . . . . East Ironbound Island, N.S.
** FROTTEN, Gary Michael . . . . . Yarmouth, N.S.
** GAUDET, Monique Suzanne . . . . . Campbellton, N.B.
* LeBLANC, Gilles Joseph . . . . . Ottawa, Ont.
MacKENZIE, Brian Royce, (Honours in Marine Biology . . . . . Dartmouth, N.S.
* NAPIER, Robert Luke . . . . . Halifax, N.S.
** REGAN, James Brendan Patrick . . . . . Dartmouth, N.S.
RIDEOUT, Arthur Armand . . . . . Saint John, N.B.
* ROBERTS, Winston (First Class Honours in Physics and a University Medal) . . . . Port of Spain, Trinidad
ROWE, Donald Gregory (Honours in Biology) Glace Bay, N.S.
** SEABOYER, Kevin Paul . . . . . Dartmouth, N.S.
STAIRS, Sara Monica Ann . . . . . Saint John, N.B.

BACHELOR OF SCIENCE—HONOURS CERTIFICATE

HANSEN, Asbjorn Erik (Honours in Biology) . . . Ottawa, Ont.
MacNEIL, Donna Marie (First Class Honours in Biology and a University Medal) . . . . . Halifax, N.S.

BACHELOR OF JOURNALISM (HONOURS) DEGREE:

ALLEN, Susan Elizabeth (First Class) . . . . Stellarton, N.S.
BRUCE, Stephen David . . . . . Truro, N.S.
CADOGAN, Joanne Marie . . . . . Chatham, N.B.
DAVIES, Christine Ann . . . . . Labrador City, Nfld & Lab.
GUILDFORD, Mary Elizabeth . . . . . Halifax, N.S.
HENDERSON, Florence Rachelle . . . Summerside, P.E.I.
LeBLANC, Michael Richard . . . . . Wedgeport, N.S.
LeDUC, Alice . . . . . Waterville, N.S.
MacLEOD, Catherine Anne . . . . . Tatamagouche, N.S.
PATTERSON, Elizabeth . . . . . Sydney, N.S.
RILEY, James Robert . . . . . Halifax, N.S.
WATSON, Stuart Ronald Melville . . . . . Lakeside, N.S.
WILLIAMS, Christine . . . . . Moncton, N.B.

BACHELOR OF JOURNALISM DEGREE:

* BAIN, Kathleen Elizabeth . . . . . Fenelon Falls, Ont.
* CAMPBELL, Donald Gordon . . . . . Halifax, N.S.
* CHISVIN, Sharon Wendy (Distinction) . Winnipeg, Man.
DAVIES, Donna Darlene . . . . . Halifax, N.S.
DENNIS, William Gregory . . . . . Riverview, N.B.
D'EON, Geoffrey Philip . . . . . Halifax, N.S.
DEXTER, Darrell Elvin . . . . . Milton, N.S.
EDWARDS, Valerie Anne . . . . . Grand Falls, Nfld.
MARSHALL, Helen Kathryn . . . . . Halifax, N.S.
McLEOD, Iain James . . . . . Bible Hill, N.S.
McLUSKIE, Steven William . . . . . Halifax, N.S.
MURRAY, Graeme Blair . . . . . Halifax, N.S.
MURTAGH, Susan Elizabeth . . . . . Halifax, N.S.
NOVOTNY, Tina Marie . . . . . Halifax, N.S.
PAYETTE, Glenn Stephen . . . . . Halifax, N.S.
RICHES, Douglas Alan . . . . . Halifax, N.S.
ROBB, Nancy Evelyn . . . . . Manotick, Ont.
* RYAN, Elizabeth Anne . . . . . Jerseyside, Nfld.
* SANFORD, Pamela Jo . . . . . Calgary, Alta.
WHITTALL, Frederick Douglas . . . . . Inglewood, Ont.

* In Absentia
** Awarded during the session

ENCAENIA AWARDS

ARTS AND SCIENCE

The Governor General's Medal . . . . . Winston Roberts
Alexandra Society Scholarship . . . . . Heather MacIvor
Claire Strickland Vair Scholarship . . . . . Susan Brown
The Stevenson Scholarship . . . . . Christopher Elson
The Lawson Prize . . . . . Douglas Morris
Harry Crawford Memorial Prize . . . . . Ronald Sherrard
The McCawley Classical Prize . . . . . Iain Luke
The Almon-Welsford Testamonial Prize . . Geoffrey Atherton
Dr. M.A.B. Smith Prize . . . . . Iain Luke
The Bishop Binney Prize . . . . . Iain Luke
The Zaidee Horsfall Prize in Mathematics . . . . . Perry Giffen
James LeBlanc

DIVINITY

The Canon W.S.H. Morris Scholarship . . . . . The Reverend Brenda Shipton
The H. Terry Creighton Scholarship . . . . . David Garrett
The George M. Ambrose Proficiency Prize . . . Peter Burchill
The Archdeacon Forsyth Prize . . . . . Sue Moxley
The Shatford Pastoral Theology Prize . . . . . David Garrett
The Kenelm Eaton Memorial Scholarship . . . Peter Somerville
Dr. C. Pennyman Worsley Prize . . . . . Ed Matthews

ENTRANCE SCHOLARSHIPS AND BURSARIES

ARTS AND SCIENCE

Cynthia Andrews	Alexandra Society Scholarship and University Scholarship
Stephen Bolton	Alumni Association Scholarship and University Scholarship
Catherine Campbell	Henry S. Cousins Scholarship and University Scholarship
Mary Campbell	University Scholarship
Iain Christie	Alumni Association Scholarship and Dr. Norman H. Gosse Scholarship
Noreen Curran	Alumni Association Scholarship and University Scholarship
Anna Erickson	Marion T. Dimick Scholarship
David Estok	The George David Harris Memorial Scholarship
Richard Gallant	Marion T. Dimick Scholarship
Susan Holle	Henry S. Cousins Scholarship and James Fear Scholarship
Simon Jackson	Alexandra Society Scholarship and University Scholarship
Mark Kingsbury	James Fear Scholarship
Temmo Korishelli	Marion T. Dimick Scholarship
Diana MacKeigan	University Scholarship
Gary McGonigall	Marion T. Dimick Scholarship
Andrea Raymond	Suzanna Weston Arrow Almon Scholarship and University Scholarship
Valerie Rouse	Holy Trinity (Yarmouth) Scholarship
David Ruggles	The George David Harris Memorial Scholarship
Heather Sanderson	Suzanna Weston Arrow Almon Scholarship and University Scholarship
Fraser Shaw	University Scholarship
Ellen Sim	Alexandra Society Scholarship and University Scholarship
Katherine Sircom	Alumni Association Scholarship
David Tregaskis	Henry S. Cousins Scholarship and Charles Frederick William Moseley Scholarship

ENTRANCE SCHOLARSHIPS

SCHOOL OF JOURNALISM

Craig Benjamin	I.B.M. Scholarship and University Scholarship
Mary Chisholm	Mercantile Bank Scholarship and University Scholarship
Nancy Cushing	The W. Garfield Weston Foundation Scholarship and University Scholarship
Brian Freeman	The W. Garfield Weston Foundation Scholarship and University Scholarship
Wilda Goyetche	Holy Trinity (Yarmouth) Scholarship and University Scholarship
Thomas Rhymes	The W. Garfield Weston Foundation Scholarship and University Scholarship
Luanne Walton	AEtna Casualty/Excelsior Life Scholarship and University Scholarship
Lisa Wamboldt	Deihl Bridgewater Bursary
Beverley Ware	Canadian Tire Scholarship and University Scholarship

STUDENT ORGANIZATIONS

The University of King's College Students' Union

The University of King's College Students' Union is the organization in which the students enjoy their right of self government. The Constitution, revised in 1974, provides for a democratic government in which the participation of every student is expected. The students endeavour to play a determining role in every aspect of university life. The Union's main organs are the Student Assembly, the Executive of the Students' Union, the Students' Council. The power of self discipline is exercised through the Union's Male and Female Residence Councils.

The Union operates through a number of permanent committees, e.g., the Academic Committee, the Social Committee, committees on the constitution, elections, finances, Dalhousie relations, awards, etc.

King's College Women's Athletic Association

Executive officers of this association are: President, Vice-President, Secretary Treasurer and Inter-Wing Manager. Its objective is the organization, administration, and promotion of women's athletics at the College. Women's varsity teams compete in field hockey, volleyball, basketball and swimming within the Women's Division of the N.S. College Conference, and the volleyball team is a member of Volleyball N.S. with the full playing privileges of that organization. A strong Inter-Wing programme operates two nights per week, and a co-ed badminton club also meets twice weekly. Table tennis and chess are also available on a recreational basis, and the swimming pool is available for recreational swimming every evening. The Women's Athletic Association in conjunction with the Men's Athletic Association is also responsible for the organization and administration of the University's annual Awards Banquet and Dance.

King's College Men's Athletic Association

The executive of this association (President, Vice-President, Secretary Treasurer and Inter-Bay Manager) is responsible for the organization, administration and promotion of the men's athletic programme at the University. Varsity athletics include soccer, basketball, hockey and swimming. The Inter-Bay League features spirited and sometimes hilarious competition between the various men's residences on the campus. Competition in road racing, volleyball, basketball, badminton, hockey and swimming are available to inter-bay competitors, and all bay members are encouraged to participate. In addition, table tennis, chess, weight-lifting, and co-ed badminton are available, and the swimming pool is open daily for student use. The Men's Athletic Association in conjunction with the Women's Athletic Association is also responsible for the organization and administration of the University's annual Awards Banquet and Dance.

King's College Dramatic Society

This society was founded in 1931 to further interest in drama. The society has recently joined with the Dalhousie Drama Society under the name of the King's Theatre. It is anticipated that the combined resources of these two groups, which draw on the amateur talent of both Universities, will enable first class studio theatre to be presented.

The Dalhousie Drama Workshop, a branch of the Department of English, offers training in voice production, acting, dance, movement, make-up, costume, set design and construction, and lighting under the direction of experienced instructors. King's students are invited to participate in the activities and productions of the workshop on the same basis as Dalhousie students.

The King's College Record

The Record (founded 1878) is published by the undergraduates of the College during the academic year. It contains a summation of the year's activities and awards.

The Quintilian Debating Society

The Quintilian Society, founded in 1845, is the oldest surviving debating association in British North America. The activities of the organization include an annual crossing of swords with the gallants of the King's Alumni Association, even more regular drubbings of the Dalhousie Debating Union, and, by the grace of Students' Union financing, participation in tournaments at Upper Canadian and American colleges and universities. The Quintilian annually hosts the Nova Scotia Provincial High Schools Debating Tournament. Finally, the Society sponsors the celebrated King's Debate series, which provides a sought after platform for public figures to debate issues of the day.

The Haliburton

The Haliburton was founded and incorporated by Act of Legislature in 1884, and is the oldest literary society on a college campus in North America. Its object is the cultivation of a Canadian Literature and the collecting of Canadian books, manuscripts, as well as books bearing on Canadian History and Literature. College students and interested residents of the metropolitan area meet to listen to papers which are given by literary figures and by the students.

The Monitor

"The Monitor" is the students' newspaper.

The Students' Missionary Society

The society was founded in 1890. Its object is to promote interest in missionary work and to further the gospel of Christ especially in the Maritime Provinces, and particularly on the University campus. The annual meeting is held on St. Andrew's Day, or as near to it as possible. The society seeks to direct its energies to the development of the spiritual life open to university students at King's and promotes a strong and lively witness to the Christian faith on the university campus. On the larger scale it addresses itself to the concerns of the faithful of the Dioceses of Nova Scotia and Fredericton.

The King's College Chapel Choir

Under the direction first of Rev. Dr. R.D. Crouse and then of Mrs. Helen Buley, the Choir has grown to about 35 members, sings three services each week and has developed a considerable range of liturgical music. A small number of Choral Scholarships are available to choir members. Applications for Choral Scholarships are to be made to the Choir Director.

The Aquinas Society

This group is concerned with the maintenance of the liturgical life of the College.

Other Societies

Each year a number of groups develop for the purpose of promoting various activities. Currently these include a chess club, a bridge club and a pre-medical society.

Awards

The Student Body of the University of King's College awards an overall "K" to participants in King's activities. Under this

system, begun during the 1956-1957 term, a student may receive a silver "K" upon amassing 160 points and a gold "K" upon amassing 250 points.

In addition several awards are presented to students for outstanding achievements in extra-curricular activities.

The Bob Walter Award. Awarded to the graduating male student who best exemplifies the qualities of manhood, gentlemanliness, and learning, and has contributed to the life at King's.

The Warrena Power Award. Awarded annually to the graduating female student who best exemplifies the qualities of womanhood, gentleness, and learning, and has contributed to the life at King's.

The Sandra MacLeod Memorial Award. This award commemorates the life of Sandra MacLeod, a University of King's College student who died in 1973, and may be given to any undergraduate member of King's, whether in residence or a day student. The award is made to a student with a good scholastic record, who by the fullest use of his or her qualities of character and mind, makes a contribution to the University of King's College. The award may be given to a student in any year of his or her degree, but will be given only if there is a deserving recipient. The award is made at the annual Alumni dinner in May.

The R.L. Nixon Award. This award is given annually to the resident male student who, in the opinion of his fellows, contributes most to residence life in King's.

The Margaret J. Marriner Award. This award is the women's counterpart of the R.L. Nixon Award. It is presented to the woman who contributes the most to the life at King's.

The Prince Prize. This prize is designed for the encouragement of effective public speaking. The recipient is chosen by adjudicators in an annual competition.

The H.L. Puxley Award. Awarded annually to the best all-round woman athlete.

The Bissett Award. This award is given annually to the best all-round male athlete.

The Arthur L. Chase Memorial Trophy. This is presented annually to the student who has contributed most to debating in the College.

The Ron Buckley Award. Awarded annually to the most valuable player on the Men's Varsity Soccer Team.

The G.H. McConnell Award. Presented annually to the men's varsity basketball player who best combines ability and sportsmanship.

The Dartmouth Sport Store Trophy. Presented annually to the most valuable player on the Men's Varsity Hockey Team.

STUDENT SERVICES

Student Employment

The Department of Manpower and Immigration, Manpower Division, in co-operation with the University, maintains a year-round Canada Manpower Centre on campus (Student Union Building, Dalhousie). This is done to assist students in obtaining employment.

All students wishing assistance in obtaining part-time and summer work, or graduates seeking permanent employment, are urged to contact the Canada Manpower Centre early in the academic year.

There are opportunities for students to earn part of their college expenses by working in the Library, Gymnasium, Dining Hall, or as Campus Police.

Student Services and Student Affairs

Dean of Student Services
E.T. Marriott, B.A., M.Ed.

The office of the Dean of Student Services (Dalhousie) is located in Room 124 of the Arts and Administration Building just opposite the Registry. The Dean provides academic counselling and co-ordinates the administration of Awards, Chaplaincy, the Counselling and Psychological Services, the University Health Unit, and acts as liaison with the Student Union. Through the Council of Student Services, which meets monthly, active participation exists between the various divisions and the officials of Housing, Recreation, and the campus Federal Manpower office. The services of this office are available to King's students.

Students should feel free to come to the Dean's office to initiate discussion about their academic programmes. They are encouraged to display that degree of maturity and self-interest which would prompt them to look for support early in the term.

A programme designed to assist students with their academic problems has been developed. All divisions of student services co-operate in the programme along with a number of departmental faculty advisers. Students experiencing difficulties are encouraged to consult with the Dean of Student Services who will discuss their problems with them and advise them of the services available.

Many students, particularly those in their first year, experience difficulty in organizing and presenting written work. In an attempt to respond to this problem, the University provides a *Writing Workshop.* Attendance is on a voluntary basis. For further information, call the Student Services Office at 424-2404.

The Dean acts as the International Student Advisor. Foreign students should look to this office for assistance and guidance in matters related to immigration status, medical insurance coverage, or any other matter of special concern to non-Canadian students.

Student Counselling Service

Director
Judith L. Hayashi, B.A., M.A.

The Student Counselling and Psychological Services Centre offers programmes for personal development as well as assistance with personal, inter-personal, and educational concerns. Counselling is offered by professionally trained counsellors and psychologists. Strict confidentiality is assured.

Individual counselling is available for any personal or social problem which a student may encounter. Typical concerns involve family difficulties, sexual problems, depression, roommate conflicts, lack of self-confidence, fears and anxieties, and decision-making difficulties.

Some of the programmes offered regularly are:
Study Skills Programme - Seven videotaped sessions concerned with improving concentration, lecture note-taking, exam writing, etc. Opportunities are provided for practice and discussion. Groups meet twice weekly at convenient times.
Career Planning Programme - Groups of students discuss career related topics such as assessing interests and abilities, obtaining occupational information, etc.
Stress Management Programme - Headaches, insomnia, exam tension and general anxiety are treated through relaxation techniques and coping skills.
Shyness Clinic (a Social Skills Programme) - Individual and group counselling to help students gain self-confidence and learn social skills.
Couples Counselling/Therapy - Couples are helped to acquire the skills to solve existing and potential marital problems.
Career Information Centre - Calendars and occupational information are available. Students are invited to drop by without an appointment to explore career possibilities.

Counselling Centre offices are on the 4th floor of the Student Union Building. Enquire or make appointments by coming in or calling 424-2082.

Tutors

The student body has an academic committee which arranges tutorial services for students.

University Health Service

Director
J.C. Johnson, M.B., Ch.B.

Dalhousie University operates an out-patient service, and an in-patient infirmary in Howe Hall, at Coburg Road and LeMarchant Street staffed by general practitioners and psychiatrists.

Further specialist's services are available in fully-accredited medical centres 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.

Emergency Treatment
In the event of emergency, students should telephone the University Health Service at 424-2171 or appear at the clinic in person. The university maintains health services on a 24 hour basis.

Medical Care-Hospital Insurance
All students should have medical and hospital coverage approved by the Health Service.

All Nova Scotia students will be covered by the Nova Scotia Medical Services Insurance. All other Canadian students should maintain coverage from their home provinces, and this is especially important for residents of Saskatchewan and Ontario and any other province requiring payment of premiums.

All non-Canadian students should be covered by medical and hospital insurance. Details of suitable insurances may be obtained from the University Health Services and all students are advised to make these arrangements prior to their arrival in Canada. Failure to do so may entail them in significant medical expenses.

Any student who has had a serious illness within the last 12 months, or who has any chronic medical condition, is advised to contact and advise the Health Service, preferably with a statement from their doctor.

Exclusions
The University Health Service does not provide the following:
(a) Medical or hospital surgical care other than that provided by, or arranged through, the University Health Service.
(b) X-ray or laboratory service, except as authorized through the University Health Service.
(c) Medications, prescriptions, or drugs, other than those provided through University Health Service.
(d) Dental treatment.

Prescriptions
Medications prescribed by the health service physicians, or consultants to whom the student is referred by the health services, may be paid by a prepaid drug plan operated by the Student Union. **All other prescriptions are at the student's expense.**

Athletic Programmes

The University has, on its campus, a regulation-sized gymnasium, complete with swimming pool and weight training room. All students in attendance at King's are encouraged to participate in some form of physical activity. The College is a member of the N.S. College Conference, and offers three types of athletic programmes.

(1) **Varsity:** for the more serious athlete who wishes to represent the University in competition with other members of the N.S. College Conference.

(2) **Inter-Residence:** is one of the strengths of the college's residence life, where competition (sometimes serious, sometimes not too serious) between Bays (men's residence) and Wings (women's residence) in volleyball, basketball, floor hockey, swimming and badminton is carried on in the spirit of friendly and good humoured competition.

(3) **Recreation:** gym time is available for those who wish merely to do their own thing, and to obtain some form of physical exercise without structured competition, games, etc.

Canadian Armed Forces

The Regular Officer Training Plan (ROTP), Medical Officer Training Plan (MOTP) and the Dental Officer Training Plan (DOTP) are completely subsidized university plans covering tuition, books, medical services, monthly pay and summer employment for up to four years of undergraduate study. Successful applicants serve as commissioned officers in the Canadian Armed Forces for varying compulsory periods after graduation.

For further information on above plans, students should contact the

Canadian Forces Recruiting Centre
Sir John Thompson Building
1256 Barrington Street
Halifax, Nova Scotia
Phone: 422-5956 or 423-6945.

Children of War Dead (Education Assistance)

Children of War Dead (Education Assistance Act) provides fees and monthly allowances for children of veterans whose death was attributable to military service. Enquiries should be directed to the nearest District office of the Department of Veterans' Affairs.

SOCIETIES CONNECTED WITH THE COLLEGE

Alumni Association of King's College

This Association, incorporated in 1847 by Act of the Legislature, consists of graduates and others whose object is the furtherance of the welfare of the University.

The Association maintains annual scholarships, and supports alumni, student and University activities.

The annual meeting of the Association is held the day before Encaenia.

The Officers of the Association:
President, (1983-85)
Prof. Bruce P. Archibald
c/o Faculty of Law
Dalhousie University
Halifax, N.S. B3H 4H9

Vice-President
Mr. James E. Cochran
26 Oakhill Dr.
Halifax, N.S. B3M 2V2

Treasurer
Mrs. Gregor Fraser
908 Greenwood Ave.
Halifax, N .S. B3H 3K9
B3H 3C4

Executive Secretary
Mrs. Marjory Gough
University of King's College
Halifax, N.S.
B3H 2A1

The Alexandra Society of King's College

This Society, which has branches all over the Maritime Provinces, was formed in Halifax in 1902 as the Women's Auxiliary to the College. It maintains an annual scholarship and bursary and a number of entrance scholarships.

Officers 1983-84

Hon. President,
Mrs. F.R. Peverill, 5770 Spring Garden Rd., Apt. 2006, Halifax, N.S. B3H 4J8

Hon. Vice-President,
Mrs. H.L. Nutter, 791 Brunswick St., Fredericton, N.B. E3B 1H8

Hon. Vice-President,
Mrs. Arthur Peters, 5720 College St., Halifax, N.S. B3H 1X3

President,
Mrs. H.D. Smith, 1606 Oxford St., Halifax, N.S. B3H 3Z4

1st Vice President,
Mrs. C.F. Whynacht, 1333 South Park St., Halifax, N.S. B3J 2K9

2nd Vice President,
Mrs. F.E. Christiansen, 94 Gibbon Rd., East Riverside, N.B. E2H 1R5

3rd Vice President,
Mrs. A. MacKeigan, 68 Reserve St., Glace Bay, N.S. B1A 4W1

4th Vice President,
Mrs. H.M.D. Westin, P.O. Box 713, Charlottetown, P.E.I. C1A 7L3

Recording Secretary,
Miss Marguerite Clarke, 44 Murray Hill Dr., Dartmouth, N.S. B2Y 3A8

Corresponding Secretary,
Mrs. E. Sheward, c/o 1360 Tower Rd., Halifax, N.S. B3H 2Z1

Treasurer,
Mrs. A.G. MacIntosh, 12 Westwood Drive, Truro, N.S., B2N 3R3

Convenors:

Friends of King's
Mrs. W.R. Harris, P.O. Box 83, 101 Queen St., Truro, N.S., B2N 2B2

Hasti-notes
Miss Janet Hunt, 1585 Oxford St., Apt. 406, Halifax, N.S., B3H 3Z3

Scrapbook
Mrs. C.W. Bennett, 1333 South Park St., Apt. 412, Halifax, N.S. B3J 2K9

Library Memorial Fund

Presidents:

Halifax Branch
Mrs. W. Palmer, 1652 Chester St., Halifax, N.S. B3H 3T4

Dartmouth Branch
Miss Marguerite Clarke, 44 Murray HIll Dr., Dartmouth, N.S. B2Y 3A8

Saint John Branch
Mrs. E.R. Puddington

PROGRAMMES OF STUDY

King's offers four Programmes of Study leading to degrees in Arts and Science.

B.A. (General) three years
B.A. (Honours) four years
B.Sc. (General) three years
B.Sc. (Honours) four years

King's offers two Programmes of Study leading to degrees in Journalism.

B.J. (Honours) four years
B.J. one year following B.A. or B.Sc.

The University of King's College and Dalhousie University have one Faculty of Arts and Science. King's students can take all the courses offered by that Faculty leading to the Bachelor of Arts or the Bachelor of Science either ordinary or with honours. Currently these degrees can be done in Social Anthropology, Biochemistry, Biology, Chemistry, Classics, Economics, English Language and Literature, French, Greek, Geology, German, History, Latin, Mathematics, Medieval Studies, Music, Philosophy, Physics, Political Science, Psychology, Religion, Russian, Sociology, Spanish, and Theatre. Joint majors or joint honours may be taken in a number of subjects. King's students can also do the pre-professional work offered by the Faculty of Arts and Science and which sometimes amounts to less than what is required for the B.A. or B.Sc. Architecture, Medicine, Dentistry, Physiotherapy, Social Work, Law, Education, Theology all accept students after one level or another of work in Arts and Science. The University of King's College does not, however, admit students to programmes which involve degrees or diplomas other than the B.A. and B.Sc. (except Journalism—B.J.,B.J. (Hons.)). For example, King's students cannot be taking the Diploma in Engineering, or the Bachelor of Music Education, nor will they be doing Commerce or Graduate Studies. What King's does offer other than what is available to Dalhousie Arts and Science students is a unique way of doing an Arts and Science first year—the Foundation Year Programme—and also the B.J. and B.J. (Hons.) taught by our School of Journalism, both of which are open only to students registered at King's College.

The King's alternative first year programme, the Foundation Year Programme, is a first year programme for both general and honours students. Bachelor of Arts students enrolled in the Foundation Year Programme do one class in addition to the Foundation Course. Bachelor of Science students in the Programme do two additional classes. Thus for B.A. students the Foundation Year Programme is equivalent to four classes, for B.Sc. students it is equivalent to three classes.

Diploma for Studies in the Humanities and Social Sciences
Students who do not intend to proceed to graduation may be admitted as Special Students into the Foundation Year Programme (equivalent to four credits), successful completion of which will result in the obtaining of the Diploma for Studies in the Humanities and Social Sciences. Permission to enrol as a diploma student must be sought through the Director of the Foundation Year Programme. Evidence of genuine interest in pursuing such studies will be considered in the admittance decision, together with high school record.

The university year begins in mid September and classes are completed by the end of April. In Arts and Science, the ordinary degree is normally completed in three years after admission, the honours degree in four years. A total of fifteen classes is required for the ordinary degree, and twenty for the honours degree. A major for the ordinary degree requires four classes beyond the first year level, taken in the second and third years. Honours degrees require a minimum of nine classes in the area of concentration after the first year, a certain standard being maintained (in some subjects an honours thesis is obligatory). Five classes constitute a normal class load in an academic year. Regulations for Journalism degrees appear below.

FOUNDATION YEAR PROGRAMME

Introduction

The University of King's College, in association with Dalhousie University, offers a special Foundation Year Programme in the first year of the Bachelor of Arts and Bachelor of Science. First offered in 1972-73, the Programme has proved a successful way of providing an integrated and inter-disciplinary course for first year students. Now approved by the Dalhousie Senate as a permanent part of the offerings of the Dalhousie-King's Faculty of Arts and Science, the Programme is open only to students registered at King's. Students taking this course will, like other King's students, be proceeding to the degrees of Bachelor of Arts or Bachelor of Science granted by the Senate of Dalhousie University, or will be engaged in one of the pre-professional courses, in Medicine, Dentistry, Law, Architecture, Divinity, Social Work, Education, Physiotherapy, and so on, or will be proceeding to the Bachelor of Journalism (Honours) awarded by King's College.

The Foundation Year Programme is a new approach to the first year of University. It is not a pre-university year but forms part of the first year work, for a B.A. or B.Sc. (King's-Dalhousie) and for the B.J. (King's) (Hons.). Literature, history, philosophy, political and social institutions, the history of science, economic forms, religion, art and music are studied together in one course in an integrated manner which sees them as interdependent elements in the development of western culture. The movement of this culture is understood through the examination of some of the most basic works in our history. To learn to deal with these works is to acquire a foundation for studies in the humanities and social sciences, just as to have a conception of the nature of our society and culture is to have a basis for thoughtful living. To provide these is the aim of this programme.

Many scientists are acutely aware of the need to understand the relation of science to other aspects of culture and to social life; a stream of the Programme will provide a general view of our culture for science students interested in these questions.

The form of the teaching is designed to meet the special problems of first year students. Enrolment in the Programme is limited to 100 Arts, 30 BJ (Hons.) and 25 Science students. The very favourable ratio of staff to students and the concentration of the student's work within one course permit the course to offer a wide variety of experiences and allow it to help students analyze, focus, and evaluate their experiences. The amount of time spent in small group tutorials permits close attention to be paid to each student's development. The exposure to many different aspects of our civilization, and the large number of departments recognizing the Programme as a substitute for their introductory class, give Foundation Year students both a wider experience from which to judge their interests and wider options for second year study.

The instructors in the programme are specialists in a wide variety of university subjects. All take the view, however, that first year study at university can profitably be devoted to attempts to integrate knowledge and understanding rather than to premature specialization in particular subjects.

Teaching Staff

Lecturers: 1983-84

R. Apostle, B.A. (Sim. Fr.), M.A. (Calif.), Ph.D. (Berkeley),
Assistant Professor of Sociology
J.P. Atherton, M.A. (Oxon.), Ph.D. (Liverpool),
Professor of Classics
G.R. Bridge, B.A. (Tufts), M.A. (T.U.), M.Div. (T.O.S.), A.M., Ph.D. (Univ. of Penn.),
University Chaplain
S.A.M. Burns, B.A. (Acad.), M.A. (Alta.), Ph.D. (London)
Associate Professor of Philosphy
R.D. Crouse, B.A. (Vind.), S.T.B. (Harvard), M.Th. (Trinity), Ph.D. (Harv.), D.D. (Trinity)
Professor of Classics
D. Farrell, B.A. (St. Norbert Coll.), M.Mus., Ph.D. (Wisc.),
Associate Professor of Music
Y. Glazov, Ph.D. (Oriental Institute, Moscow),
Professor of Russian and Chairman of the Department
J.F. Godfrey, B.A. (Tor.), B.Phil. (Oxon.), D. Phil. (Oxon.),
Associate Professor of History and President, University of King's College
J.F. Graham, B.A. (U.B.C.), A.M., Ph.D. (Col.), F.R.S.C.,
Fred D. Manning, Professor of Economics
N.H. Graham, B.A. (Dal.), B.Ed. (Dal.),
G.P. Grant, B.A. (Queen's), D. Phil. (Oxon.), F.R.S.C.,
Professor of Humanities
W.J. Hankey, B.A. (Vind.), M.A. (Tor.), D.Phil. (Oxon.),
Associate Professor of Classics
R.C. Kaill, B.A. (Dal.), B.D., M.S.A. (Tor.), Ph.D. (McG.),
Associate Professor of Sociology and Chairman of the Department
W.H. Kemp, Mus. Bac., Mus. M. (Tor.), A.M. (Harv.), D. Phil. (Oxon.),
Professor of Music
A.E. Kennedy, B.A., M.A. (U.B.C.), Ph.D. (Edinburgh),
Professor of English
P.F. Kussmaul, Ph.D. (Basle),
Associate Professor of Classics
H. Roper, B.A. (Dal. et Cantab.), M.A., Ph.D. (Cantab.),
Associate Professor of Humanities and Social Sciences, Vice-President, Registrar, University of King's College
R. Rosen, B.S.(Brooklyn), M.A.(Col.), PhD.(Chic.)
Professor of Biophysics
C.J. Starnes, B.A. (Bishops), S.T.B. (Harv.), M.A. (McG.), Ph.D. (Dal.),
Associate Professor of Classics, Director, Foundation Year Programme
D.H. Steffen, (Ph.D.(Gott.)
Associate Professor of German
J.B. Stovel, B.A.(Sir G. Wins), M.A.(Cantab.), Ph.D.(Harv.)
Associate Professor of English
K.E. von Maltzahn, M.S., Ph.D. (Yale),
Professor of Biology

Junior Fellows: 1983-84

D.P. Curry, B.A. (Vind.), M.A. (Dal.), M.T.S.(Harvard), M.Div. (Trinity)
A.M. Johnston, B.A. (Mt. A.), M.A. (Dal.),
Associate Director, Foundation Year Programme
K. Kierans, B.A. (McG.)
K.M. Morrison, B.A. (L.U. et Dal.)
R.L. Sullivan, B.A.(Guelph), M.Sc.(Lond.)
E.P. Thomson, B.A.(St. John's), M.A.(Dal.)

Admission Requirements

The admission requirements are those pertaining to the Faculty of Arts and Science, i.e., Nova Scotia Grade XII or its equivalent. Mature students, students whose education has been interrupted and who do not meet the normal admission requirements, but who can demonstrate that there is a reasonable likelihood of success at university, may be admitted as special cases. Students from New Brunswick and Prince Edward Island should complete Grade XII and have an average of 60%. Very exceptional students from Nova Scotia Grade XI and students not in the University Preparatory Programme are also considered for admission on their individual merits.

Scholarships

Scholarships ranging from $3,000 to $500 are open to students entering the Foundation Year Programme in Arts, Science and Journalism. Application for admission constitutes application for a scholarship. In recent years more than one quarter of the entering students have received awards. Scholarships provided from monies given in memory of Henry S. Cousins and Dr. Norman H. Gosse are open only to students entering the Foundation Year Programme. The two George David Harris Memorial Entrance Scholarships ($3,000) require a separate application—see the entry under Scholarships, Bursaries and Prizes elsewhere in the calendar.

Course Designation, Lecture and Tutorial Hours

The formal designation of the Programme courses is as follows:

King's Interdisciplinary Studies

K100 Foundation in Social Science and Humanities; Lectures M.W.Th.F. 9:35 a.m. - 11:25 a.m.; Four hours of tutorials to be arranged.

K110 Foundation in Social Science and Humanities; Lectures M.W.F. 9:35 a.m. - 11:25 a.m.; Three hours of tutorials to be arranged.

Grading and Credit

The Programme is to be regarded as a complete unit. It is not possible for students to enrol in only part of the course. Evaluation of the students' performances is continuous and made on the basis of tutorial participation, examinations and essays. The final grade is a composite of all evaluations. Final grading is the result of discussion among all those teachers who have had grading responsibilities. Grades are given in terms of the letter grade system of the Faculty of Arts and Science.

Successful completion of the Programme gives students in the K100 course twenty-four credit hours or four class credits toward a Bachelor of Arts or Bachelor of Science degree. These students do one other class to achieve a complete first year. Students taking K110 do two courses in addition to their work in the Foundation Year Programme. This stream of the Foundation Year Programme carries eighteen hours of credit, i.e., three class credits and comprises three-quarters of the work and requirements of K100. Normally students taking K100 would be candidates for the Bachelor of Arts degree and students taking K110 will be candidates for the degree of Bachelor of Science but exceptions may be made.

The Foundation Year Programme may be combined with almost any programme of study in Arts and with many in Science but in all cases students are requested to discuss their proposed programs with the Director before completing their registration.

Upon successful completion of the Programme the normal departmental requirement of passing an introductory course in the discipline concerned is waived by the following departments:
English Language and Literature
History
Philosophy
Sociology

The following departments admit students completing the Foundation Year Programme to introductory and advanced courses for which there is no language requirement:
Classics
German
Spanish
Russian

The following special departmental provisions have been established:

Biology
Successful completion of the Foundation Year Programme supplies the prerequisites for Biology 3400, 3401A, 3401B.

These are courses in the history of science, the history of biological sciences and man in nature.

Economics
Honours students in Economics who have completed the Foundation Year Programme are exempted from doing one economics course.

German
Successful completion of the Foundation Year Programme may be regarded as a substitute for German 220.

Religion
The Department of Religion recognizes the Foundation Year Programme as satisfying the prerequisites for Religion 2101, 2202 and 2531.

While there are no special arrangements with the Department of Political Science, students should note that some second year Political Science classes have no prerequisite and the Department will consider waiving the requirement for certain introductory courses.

Pre-Professional Training

The Faculties of Medicine and Dentistry and the School of Physiotherapy of Dalhousie University have approved the Foundation Year Programme as part of the pre-professional work they require for admission to their respective faculties and schools. Students may substitute the Programme for the appropriate requirements laid down by these faculties; for details of these provisions consult the Director of the Foundation Year Programme. The Department of Education of Dalhousie University waives its requirement of English 100 for students enrolled in the B.Ed. Integrated Course who have successfully completed the Foundation Year Programme. The University of King's College requires the Foundation Year Programme for its first year of the B.J. (Hons.) degree.

Evaluation

The mark for the course is based on students' papers, examinations and their class participation. No student will be able to pass the course without completing the written requirements. All students (K100 and K110) write the first essay of the year within two weeks from the start of term. Beyond this, students registered in K100 will write two essays for each of the six units of the course. Students in K110 write two essays in three of the six units and one essay for each of the three remaining units. Some of the additional work of students in K100 will relate to the Thursday lectures which are required for them but not for students in K110.

Outline of the Foundation Year Programme

The course has its own logic; it is not just a collection of diverse materials but integrates them in accord with the interpretation of our culture which it develops. As we work out this interpretation, we consider works of various kinds, some of the most crucial works in this culture. These we consider no matter what discipline ordinarily studies them. Thus we look, for example, at Mozart's *The Magic Flute,* early Greek urns, Michelangelo's "Last Judgement", the Bamberg Dom; these are usually understood to belong to the disciplines of music, archaeology, art history, and architecture. We read Homer's *Odyssey,* Shakespeare's *The Tempest,* Eliot's *The Waste Land;* works usually studied by the departments of classics, theatre, and English literature. We analyse St. Anselm's *Proslogion,* Descartes' *Meditations,* and Luther's *The Freedom of a Christian,* which are usually studied by departments of theology, philosophy and religion. We study Diaz's *The Conquest of New Spain,* Rousseau's *Social Contract,* Marx, *The Communist Manifesto,* Heilbroner's *The Making of Economic Society;* works thought to belong to history, political theory, economics and sociology. We read selections from Kepler's *Epitome of Copernican Astronomy,* Darwin's *On the Origin of Species,* and Newton's *Mathematical Principles;* texts taken from the history of astronomy, biology and physics.

The logic we develop to integrate the different stances of these various works is of two kinds. On the one hand, we see how each of these works shows the nature of the different epochs or stages of our culture and how each of these civilizations breaks up to form the one succeeding. On the other hand, we trace some institutions, ideas and movements through each of the historical periods.

The following are the teaching units of the course. One or more of the aspects of culture mentioned above tends to be stressed in each unit. This is both because of the differences between the general character of each period and also on account of the particular approach which the co-ordinator responsible for the section brings to the presentation of it. Four teaching weeks are devoted to each of these units.

1. **The Ancient World:** the origin of the primary institutions and beliefs of the western world in Greece, Rome and Israel. Religion manifesting itself in art, myth and institutions provides a focus for our approach to this epoch.

2. **The Medieval World:** the formation of Christendom. The development of Christian forms in political, social, intellectual life as these grow in contrast to and by assimilation of ancient culture is our main concern. We attempt to grasp the unity of this world as the medievals themselves saw it in Dante's *Divine Comedy*.

3. **The Renaissance and Reformation:** the foundations of modernity in the break-up of the medieval world. The worldliness of the Renaissance and the renunciation of this in the Reformation form the two poles of our treatment of this period.

4. **The Age of Reason or the Englightenment:** modern freedom developed theoretically in the philosophy of Descartes and in relation to nature and society is the central theme. Special attention is paid to political theory and natural science in this section.

5. **The Era of Revolutions:** bourgeois culture from its triumph in the French Revolution to its collapse in World War I. The nineteenth century is mainly treated in terms of the revolutions, political and industrial, and we endeavour to understand the rise of parties and ideologies relative to them. The century is seen as providing the transition between Classical and Romantic Europe and our own Post-Romantic nationalistic individualism.

6. **The Contemporary World:** the period since World War I is characterized by the shift of political, economic and cultural power from Europe to Russia and the United States and to Asia and Africa, and by the technological and bureaucratic organization of the total means of life for individual well-being and freedom.

The following are the recurring general topics which are discussed in each of the units outlined above:
(a) Political institutions, the modes of authority, conceptions of law and the person, the political ideal.
(b) Religious, theological and philosophical positions and forms.
(c) The conception of nature and forms of natural science.
(d) Economic institutions.
(e) The structure of society.
(f) Literary, musical and artistic expression.

A classroom with facilities for slides, films and musical reproduction is used so that the presentation of these aspects of culture can be an integral part of the teaching.

Required Reading (1983-84)

Section 1 — The Ancient World

The Akkadian Creation Epic, (Selections).
The Epic of Gilgamesh, (Selections).
Homer, *Odyssey.*
Sophocles, *Oedipus Rex, Antigone.*
The Bible, Genesis, Exodus, Isaiah, Job.
Plato, *Republic.*
M.R. Cohen and I.E. Drabkin, "Note on the Ptolemaic System".
Vergil: *Fourth Eclogue, Aeneid.*

Section II — The Middle Ages

The Bible, Epistle to the Romans.
"The Apostles' Creed"
"The Nicene Creed"
Eusebius, *Life of Constantine* and *Oration,* (Selections).
St. Augustine, *The Confessions.*
Gregory of Tours, *History of the Franks,* (Selections).
H. Bettenson, *Documents of the Christian Church,* (Selections).
St. Benedict, *The Rule,* (Selections).
B. Pullan, *Sources for the History of Medieval Europe,* (Selections).
St. Francis, *The Rule,* (Selections).
R.W. Southern, *Making of the Middle Ages,* (Selections).
The Song of Roland.
Boniface VIII and Philip IV, (Selected Documents).
St. Anselm, *Proslogion*
Dante, *Divine Comedy.*
St. Thomas Aquinas, *Summa Theologica,* (I, qq. 1 and 2.).

Section III — The Renaissance and Reformation

Pico della Mirandola, Oration on the Dignity of Man.
Vasari, *Lives of the Artists,* (Selection).
Jacob Burckhardt, *The Civilization of the Renaissance,* (Selections).
Machiavelli, *The Prince.*
Shakespeare, *The Tempest.*
Martin Luther: Selections from his Writings, ed. by John Dillenberger.
C. Marlowe, *Doctor Faustus.*
Bernal Diaz, *The Conquest of New Spain.*
Ias Casas, *The Devastation of the Indies,* (Selection).
J. Kepler, *Epitome of Copernican Astronomy,* (Selection).
Westfall, *The Construction of Modern Science,* chapters 1 and 2.
Ignatius Loyola, *Spiritual Exercises,* (Selection).
Jean Calvin, *Institutes of the Christian Religion,* (Selections).
Teresa of Avila, *The Way of Perfection* (Selections)

Section IV — The Age of Reason

Molière, *The Would-be Gentleman*
Descartes, *Meditations on First Philosophy.*
Hobbes, *Leviathan,* Parts 1 and 2.
Hume, *Enquiry Concerning Human Understanding,* (Selections), *A Treatise of Human Nature,* (Selections).
Rousseau, *Discourse on the Origin and Foundation of Inequality among Mankind, The Social Contract,* Books I and II.
I. Newton, *Principia Mathematica,* (Selection).

A. Koyré, "The Significance of the Newtonian Synthesis".
W. Mozart, *Zauberflötte.*

Section V — The Era of Revolutions

de Tocqueville, *The Old Regime and the French Revolution.*
Coleridge, *The Rime of the Ancient Mariner.*
Dickens, *Hard Times*
J.S. Mill, *Utilitarianism.*
Dostoevsky, *Crime & Punishment*
R. Nisbet, *The Sociological Tradition,* (Chs. 1 and 2).
Marx and Engels, *The Communist Manifesto* and Marx, Economic and Philosophic Manuscripts of 1844, (Selections).
Adam Smith, *The Wealth of Nations,* (Selections).
R.L. Heilbroner, *The Making of Economic Society* (Chs. 1 and 3).
F. Nietzsche, *On the Genealogy of Morals.*

Section VI — The Contemporary World

S. Freud, *A General Introduction to Psychoanalysis* (Selection)
J. Monod, *Chance and Necessity* (Selection)
M. Heidegger, *Letter on Humanism.*
H. Gollwitzer, *Europe in The Age of Imperialism.*
T.S. Eliot, *The Waste Land.*
Correilli Barnett, *The Swordbearers: Studies in Supreme Command in the First World War,* (Selections).
A. Einstein "Autobiographical Notes".
W. Bolsche, *The Scientific Foundations of Poetry,* (Ch.1).
E. Nolde, "The Art of Primitive People" and "Alsen-Berlin" from *My Life.*
C.G. Jung, "Spirit and Life".
Alex Thio, *Deviant Behaviour,* (Ch. 1).
D.J. Grout, *A History of Western Music,* (Ch. 20).
R.L. Heilbroner, *Economic Society,* (Chs. 7-9).
Sartre, *Existentialism is a Humanism.*

THE SCHOOL OF JOURNALISM

The University of King's College offers the only degrees in Journalism in the Atlantic Provinces. The University offers two degrees.

1. The four year Bachelor of Journalism with Honours, B.J. (Hons.)

General Description: The aim of the B.J. (Hons.) programme is to provide a grounding in the methods and problems of contemporary journalism in the context of a liberal education. In addition to training in journalistic skills and methods, the student will acquire both a knowledge of the history of Western civilization and a specific competence in some one of the traditional disciplines of Arts and Science. As well the University will require the attainment of a certain degree of competence in both of the official languages of Canada.

In the first year the B.J. (Hons.) student will normally take the Foundation Year Programme (see page 47 of this calendar) and an elective in the Arts and Science Faculty. Electives will usually be taken in the field of Arts and Science in which the student aims to fulfill the Arts and Science requirement of the B.J. (Hons.) programme. Each B.J. (Hons.) student will be asked to submit to the Journalism Studies Committee by the end of the first year, a proposal for a coherent academic programme involving an in-depth study of a particular area or discipline for the four courses that must be taken in the second year, and the two courses that must be taken in the third year in the Faculty of Arts and Science. The Committee will advise each student on his/her proposed programme, and will approve with changes, where necessary, each student's plan. Any subsequent changes in a student's programme will require the approval of the Committee. In addition, second year students are required to do a full course in Writing and Reporting in the School of Journalism.

In the third year the student will take three courses in Journalism designated by the School of Journalism, and two courses in the Faculty of Arts and Science (see above.)

In the fourth year the student will take five courses in the School of Journalism.

French Requirement
It is the policy of the University that students graduating from the School of Journalism shall pass a test demonstrating their comprehension of written French. The test may be taken at any time and, if failed, may be tried again at a later date without academic penalty. Credit courses will be available to bring a student up to the required level, though the successful completion of such a course or courses does not, in itself, waive the requirement of passing the test.

Students are encouraged to take the test as early as they can during the course of studies so that they may know how they stand with respect to this requirement. The University will normally administer the test at the beginning and end of each academic year and at other times by special arrangement.

Typing Requirement
A reasonable ability to type is required and students entering the School of Journalism must learn to type before the workshops begin. (For B.J. (Hons.) students, this means they should know how to type by the beginning of their second year in the Journalism programme: for B.J. students, before entering the School.) All assignments in the School of Journalism must be typewritten.

2. The one year Bachelor of Journalism (B.J.)

This is a post-first degree course offered to students who have completed a first degree, normally a B.A. or B.Sc. The University of King's College expects the same degree of competence and in the same areas for those who graduate from this programme as it does from those who graduate with the B.J. (Hons.) degree. Specifically this means: (1) students who are admitted to this programme must show the same competence in French required of those who graduate with the B.J. (Hons.) and (2) admission to the programme depends on the student's ability to show that he or she has acquired a broad knowledge of the history of Western civilization such as the Foundation Year Programme provides as well as having a competence in an area of humanistic study.

Because of the intensive nature of this one year programme it does not conform to the lecture schedule of the Faculty of Arts and Science. Students in the B.J. programme will begin work during the first week of September (see Almanac) and will continue somewhat beyond the last day of classes in Arts and Science. Please see the B.J. curriculum below for the courses offered in this programme.

3. Curricula for B.J. (Hons.) and B.J. programmes.

See the following two pages for the B.J. (Hons.) and B.J. curricula.

B.J. (Hons.) Curriculum

		Credits	Total Credits
Year 1	**Required of All Students**		
	Foundation Year Programme and one elective course in the Faculty of Arts and Science	4	
	Normally, although not necessarily, this would be a French course. See the statement on the French Requirement.	1	5
Year 2	**Required of All Students**		
	Courses in the Faculty of Arts and Science	4	
	Each B.J. (Hons.) student must submit to the Journalism Studies Committee by the end of the first year a proposal for a coherent academic programme involving study of a particular area or discipline for the four courses that must be taken in the second year, and two courses that must be taken in the third year in the Faculty of Arts and Science. The Committee will advise each student on his/her proposed programme and will approve (with changes where necessary) each student's plan. Any subsequent changes in a student's programme will require the approval of the Committee. See also Regulations 6 and 7 in the General Academic Regulations for the School of Journalism.		
J201R	Introduction to Journalism Basic Writing and Reporting	1	5
Year 3 **FIRST TERM**	**Required of All Students**		
	Courses in the Faculty of Arts and Science	2	
J301/R	Writing and Reporting (prerequisite J201/R) (continues in second term)	1	
J317/A	Journalism Research	1/2	
J316/R	Newspaper Production (continues in second term)	1	
SECOND TERM			
	Courses in the Faculty of Arts and Science		
J310/B	Introduction to Broadcasting	1/2	5
Year 4 **FIRST TERM**	**Required of All Students**	**Credits**	**Total Credits**
J401/A	Advanced Writing and Reporting	1/2	
	Students will develop programs to meet individual goals in consultation with faculty advisers. To complete their fall term work, they will select four half-courses or equivalent from the following:		
J420/A	Senior News Seminar	1/2	
403/A	Magazine Writing (prerequisite 403/B)	1/2	
J411/A	Legal Issues	1/2	
J445/A	Issues in Business, Finance and Economics	1/2	
J471/A	Broadcast Writing (prerequisite to J440B and J441B)	1/2	
J472/A	Copy Editing (prerequisite to 472/B)	1/2	
J416/A	Newspaper Production	1/2	
J480/R	Diplomatic Reporting	1	
SECOND TERM	**Required of All Students**	**Credits**	
	Students will choose five half-courses from the following:		
J403/B	Magazine Writing	1/2	
J404/B	Interpretive and Analytical Reporting	1/2	
J440/B	Radio Production	1/2	
J441/B	Television Production	1/2	
J450/B	Specialist Writing	1/2	
J472/B	Copy Editing	1/2	5

B.J. Curriculum

FIRST TERM	Required of All Students	Credits	Total Credits
J501/A	Advanced Writing and Reporting	1/2	
	Students will develop four half-courses or equivalent from the following:		
J520/A	Senior News Seminar	1/2	
J503/A	Magazine Writing (prerequisite to 503/B)	1/2	
J511/A	Legal Issues	1/2	
J545/A	Issues in Business, Finance and Economics	1/2	
J571/A	Broadcast Writing (prerequisite to J540B and J541B)	1/2	
J572/A	Copy Editing (prerequisite to 572B)	1/2	
J580/R	Diplomatic Reporting	1	
SECOND TERM	**Required of All Students**		
	Students will develop programs to meet their individual goals in consultation with faculty advisers. To complete their Spring Term work, they will select five half-courses from:		
J503/B	Magazine Writing	1/2	
J504/B	Interpretive and Analytical Reporting	1/2	
J540/B	Radio Production	1/2	
J541/B	Television Production	1/2	
J550/B	Specialist Writing	1/2	
J572/B	Copy Editing	1/2	
J516/B	Newspaper Production	1/2	5

DIVINITY

Director of Parish Field Work and Divinity Secretary
Rev. G. Russell Hatton, B.A., S.T.B., S.T.M., Ph.D.

With the establishment of the Atlantic School of Theology during 1974, the work of the Faculty of Divinity of the University of King's College was transferred to that School and the Faculty dissolved as a teaching component of King's College.

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INSTITUTE OF PASTORAL TRAINING

University of King's College
Atlantic School of Theology
Acadia Divinity College
Medical Faculty of Dalhousie University

The organization of the Institute, by collaboration of University of King's College, Pine Hill Divinity Hall, the Divinity School of Acadia University, Presbyterian College (Montreal), Medical Faculty of Dalhousie University, pioneered this modern development in theological education on the Canadian scene. It is the objective of the Institute to bring pastors and theological students face to face with human misery as it exists both in and out of institutions, principally through courses in Clinical Pastoral Education in both general and mental hospitals, reformatories and juvenile courts, homes for the aged, alcoholism treatment centres, and other social agencies. In this connection, the Institute now sponsors courses in Clinical Pastoral Education, usually commencing mid-May, at the Nova Scotia Hospital, Dartmouth (mental), the Victoria General Hospital, Halifax, the New Brunswick Provincial Hospital in Lancaster, N.B., King's County Hospital, Waterville, N.S., Springhill Medium Correctional Center, Springhill, N.S., and the Abbie Lane Memorial Hospital, Halifax, N.S.

While the above-mentioned courses aim primarily at increasing the pastoral competence of the parish minister or church worker, students of particular aptitude and interest can be guided in further theological training to become qualified teachers of these subjects in theological courses, directors of clinical training courses, and institutional chaplains; also, in certain cases, to become experts in particular specified fields, such as ministering to the mentally ill or alcoholics, where the church may have a significant role to play in partnership with other helping professions.

A recent development in this field was the formal constitution in December 1965 of "The Canadian Council for Supervised Pastoral Education". In 1974 the Canadian Council for Supervised Pastoral Education officially adopted the shorter and now more appropriate title of Canadian Association for Pastoral Education which seeks to co-ordinate training across Canada, establishing and maintaining high standards, accrediting training courses, and certifying supervisors. The Institute of Pastoral Training has links with the Council, a former Executive Director served as President of the Council and as a member of the Board of Directors, and members have served on the Council's Committee on Accreditation and Certification.

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One to four day workshops are held in various localities in the Maritimes, and information as to what is involved in setting one of these up may be obtained from the Secretary of the Institute.

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EXTENSION COURSES

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1983-84 Courses

Journalism Instructor: G. Hancock, B.A., Dip. Journ.

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FACULTY OF ARTS AND SCIENCE

Introduction

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During the students' undergraduate study, through intellectual interaction with the other members of the academic community, they should gain the background knowledge, the ability and the appetite for independent discovery. This point is marked formally by the award of a Bachelor's degree.

The Faculty of Arts and Science at Dalhousie is divided into twenty-three departments representing at least that number of intellectual disciplines. Most of the departments are devoted either to the liberal arts or the pure science. In addition, at Dalhousie this Faculty contains a second group of rather professional departments including Music, Theatre, Education and Engineering. An important role of these professional departments is to prepare students for employment in the corresponding profession.

Much less well understood is the role of the liberal arts and pure science departments. The Bachelor's degrees of B.A. or B.Sc. are not intended to signify that the student is qualified for any particular job. The goal of such programmes is simply to produce educated persons. Some concentration in certain disciplines is normally demanded to avoid superficial education. However, no one with a B.A. or a B.Sc. is a fully-qualified professional. A B.A. or a B.Sc. often plays a second role as a prerequisite to a professional programme of study or as a stage towards a Ph.D. in arts or science discipline.

The non-professional departments in Dalhousie's Faculty of Arts and Science comprise the humanities, foreign languages, social sciences, life sciences, and physical sciences. One should sample courses in each of the above areas to have some appreciation of the ways of other disciplines.

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Biology
Chemistry
Classics
Economics
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Engineering
English
French
Geology
German
History
Mathematics, Statistics and Computing Science
Music
Oceanography
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Physics
Political Science
Psychology
Religion
Russian
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Academic Programmes

1. Courses of Study

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Diploma in Engineering
Bachelor of Music
Bachelor of Education
Sequential Programmes
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Bachelor of Music Education
Diploma in Costume Studies

2. Definitions

2.1 Subject Grouping

A. Languages
French
German
Greek
Latin
Russian

B. Humanities
Classics
Comparative Literature
English
History
Mediaeval Studies
Music
Philosophy
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C. Social Sciences
Economics
History
Political Science
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D. Sciences
Biochemistry
Biology
Chemistry
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Classes are offered also in other subjects: African Studies, Architecture, Art History, Education, Engineering, Engineering-Physics, Oceanography and Humanistic Studies in Science.

2.2 Merit Points

Merit Points are awarded for each class as follows:

Grade	Points
A+, A, A-	3
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2.2 Merit Points

Merit Points are awarded for each class as follows:

Grade	Points
A+, A, A-	3
B+, B, B-	2
C+, C, C-	1
D+, D, D-	0

Note that although D is a passing grade, no points are awarded. For fractional credit classes, corresponding fractional merit points are awarded (e.g., in a half-credit class, an A would yield 1-1/2 points).

2.3 Merit Points for Classes Transferred From Other Institutions
Merit points are not awarded for classes transferred from another institution, except where:
1. the external classes are taken to pursue a programme of study approved in advance by the Faculty (at the present time this refers only to the programmes at Stirling University, Université de Provence (Aix-Marseilles), the Pushkin Institute, Leningrad University and the Colegio de Espana;
2. the performance in the external class is first class; *and*
3. these classes are approved by the Committee on Studies for that purpose for the particular student.
Departmental advice on the equivalent Dalhousie grade for a particular class is sought where necessary.
In computing the merit points required for minimum standing (5.2.1 below) or distinction (5.2.2 below) *all* Dalhousie classes taken must be included *and* there must be at least ten Dalhousie classes included.

3.0 Transition Year Programme

The Transition Year Programme is a special one-year programme open to Nova Scotian Black and Native students who wish to enroll at Dalhousie University but have not yet developed all the skills needed for university-level study. In a variety of ways and contexts, the programme introduces its members to the university coummunity and helps them prepare for admission to regular university programmes at the beginning of their second year on campus. Those admitted to the Programme may receive financial support for room, board, tuition, and books, as well as a small monthly stipened for personal expenses.
Although enrollment is limited, so that students can receive considerable individual attention, highly motivated Native and Black Nova Scotians of all ages and educational backgrounds are encouraged to apply.
For application forms or further information, please contact:
Transition Year Programme
Dalhousie University
Halifax, N.S. B3H 4H6
Telephone: (902) 424-3730

4. Programme Advice

4.1 Entering Students
Students who wish to declare their major at initial registration must consult with the department concerned regarding their first-year programme.

Students entering the King's Foundation Year Programme should consult the Director of the Programme before registration.

4.2 Students who have Completed the First Year
Students entering the second year are assigned a Faculty advisor with whom they must consult regarding their programme. Normally the department concerned assigns an advisor to a student once the major subject has been declared. Students seeking to enter an Individual Programme (section 5.2.6 below) or an Unconcentrated Honours Programme (section 5.3.6.2 below) must approach the Chairperson of the Programme Advisory Committee which assigns an advisor or advisors and which must give approval to programmes of these types.

4.3 Prospective Teachers
Students considering teaching as a profession should before registering consult the Chairperson of the Department of Education regarding their programme of study. Those considering music teaching should consult with the Chairperson of the Department of Music.

4.4 Part-Time Students
Part-time students may follow most of the programmes offered by the Faculty. For such students the normal requirements and regulations apply, it being understood that the first five classes taken constitute the first year of study, the second five classes the second year of study, etc. For example, paragraph 5.1 below applies to the first five classes for a student working for a B.A. or B.Sc., and paragraph 5.2 applies to the next ten classes of such a student.

5. Bachelor of Arts/Bachelor of Science

Major, Co-ordinated or Individual Programmes: three years - 15 full credit classes required
Honours Programmes: four years - 20 full credit classes required plus an additional credit for the honours qualifying examination.

5.1 The First Year

5.1.1 Requirements
(a) Each full-time student planning to take a B.A. or a B.Sc. in the first year normally takes five full credit classes or the equivalent in half-credit classes, chosen from groups A, B, C, and D. (The King's Foundation Year Programme is equivalent to four classes for B.A. candidates or three classes for B.Sc. candidates.)

(b) Students in the first year may not take for credit more than the equivalent of two full credit classes in a single subject from the lists given in section 2 above.

(c) 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 classes are approved by the Curriculum Committee and are listed below.

Classics 101, 102, 103, English 100, German 100, 105, History 1400, 1990, Philosophy 101, 102, 103, 106, 107, Political Science 1103, Religion 1301, Spanish 110A/B, and 111A/B.

(d) In order to qualify for a B.Sc. Degree candidates are required to complete successfully at least one full University class in Mathematics other than Mathematics 102 and Mathematics 110.

5.1.2 Recommendations
(a) Students should seriously consider choosing a class from a list of classes which deal with a formal subject. This list is in the Programme Planning Guide and has been approved by the Curriculum Committee.

(b) Students should consider becoming fluent in French.

(c) It is recommended that one class be chosen from each of the groups A, B, C, and D. (This recommendation does not apply to students entering the King's Foundation Year Programme.)

5.1.3 Special Options
(a) First-year students may (but need not) declare their intended major department and may be accepted by the chosen department at initial registration. Such students must consult with the department concerned regarding their first-year programme.

(b) The King's Foundation Year Programme offers the first-year student in Arts and Science an integrated introduction to the humanities and social sciences through study of some of the principal works of western culture. To take advantage of this Programme students must be enrolled at King's. Details are to be found in the Calendar of the University of King's College, and advice may be obtained from the Director of the Programme.

5.2 Major, Co-ordinated and Individual Programmes

5.2.1 Minimum Standing for a B.A. or B.Sc. Degree
In order to qualify for the award of a B.A. or B.Sc. degree, candidates must have obtained a minimum of twelve merit points (see 2.3 above) on the fifteen classes required. This minimum is adjusted in proportion to the number of Dalhousie credits received relative to the number required.

5.2.2. B.A. or B.Sc. Degree with Distinction
A B.A. or B.Sc. degree will be marked "With Distinction" to students who have achieved an aggregate of 40 merit points (see 2.3 above) in the 15 classes taken for their degrees or a proportional figure if they have taken more than 15 classes. Repeated classes count as additional classes in this context.

5.2.3 Programme Selection for the Second and Third Years
Students who have successfully completed the first year may, if qualified, enter an honours programme as outlined in Section 5.3 below. Otherwise, three types of options are open during the second and third years of study as follows:

(a) *Major Programmes*, in which students must select a major subject and plan the programme in consultation with that department, but the structure of study in the major and elective classes may be relatively loose;

(b) *Co-ordinated Programmes*, offered by some departments or groups of related departments, each programme requiring either one or two years of relatively concentrated study in the departmental or interdepartmental area of specialization; and

(c) *Individual Programmes*, for students whose academic needs are not met by the foregoing options.

The rules governing each of these options are outlined below.

5.2.4. Major Programmes

5.2.4.1 The ten full credits, or the equivalent in half-credit classes, making up the course for the second and third years must meet the following requirements:

(a) at least seven classes shall be beyond the 100 level;

(b) at least one class shall be in each of at least three subjects;

(c) (i) at least four and no more than eight classes *beyond the 100 level* shall be in a single area of concentration (the major). (ii) up to four of the classes in the major subject must be selected in accordance with departmental or interdepartmental

requirements outlined **in the Calendar** under Programmes of Study. These requirements may also designate particular offerings of the department (e.g. service classes) as unacceptable in constituting a part of the major specialization.

5.2.4.2 On registration in their second year students must declare a major and have it approved by the department concerned.

5.2.4.3 For the B.A., the major may be chosen from Classics, Economics, English, French, German, Greek, History, Latin, Music, Philosophy, Political Science, Religion, Russian, Sociology and Social Anthropology, Spanish, Theatre or from any of the B.Sc. major subjects.

5.2.4.4 For the B.Sc. the major subject must be chosen from Biology, Chemistry, Computing Science, Geology, Mathematics, Physics, or Psychology.

5.2.4.5 Students may choose electives from any of the classes listed by departments offering major or honours programmes in the Faculty of Arts and Science, subject to the restriction that a total of not more than THREE classes may be taken from the list below:

(a) African Studies 200, Art History 101 and Comparative Literature 100.

(b) Education Foundation Offerings (Education classes with numbers below 4400). Note: Education classes numbered 4400 and above are not available as Arts and Science electives.

(c) Classes in Engineering and Oceanography. Note: The restriction on Engineering electives does not apply to students in the Diploma in Engineering Programme who combine their studies with a programme leading to a B.Sc. in Biology, Chemistry, Computing Science, Geology, Mathematics or Physics (see Degree Regulations 7(b) in this Calendar).

(d) Classes in Music. Note: Music classes 1000, 2007, 2088C, 2089C, 2010, 2012, and 2013 are available as normal electives, but other classes in Music may be taken by special permission of the Department of Music.

(e) The following approved classes from other faculties and institutions: Architecture 100, Commerce 1101A/B, 1102A/B, 1401A/B, 2201A/B, 2301A/B, 2302B, 2601A/B, 3203A/B, 3304A/B, 3306A/B, 3308B, 3501A/B, 4120A/B and Health Education 4121A/B.

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

5.2.5 Co-ordinated Programmes
Students may in their second and third years follow a two-year or two one-year integrated programme(s) of study. If two one-year programmes are chosen, they may be in different departments. All such co-ordinated programmes have been explicitly approved by the Curriculum Committee. A department or group of departments offering co-ordinated programmes may structure them as it wishes, consistent with sound academic practice and subject to the following guidelines:

(a) that the equivalent of five class units constitute a normal year;

(b) that the function of each programme form part of the Calendar description of each programme;

(c) that each two-year programme permit students at least one class of their own choice in each of the second and third years;

(d) that two-year programmes normally not be exclusively in a single discipline;

(e) that the normal prerequisite for entry into a departmental one-year or two-year programme be the introductory class of the department 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 Co-ordinated Programme should consult as early as possible with the departments concerned.

5.2.6 Individual Programmes
Students whose academic needs are not met by the programme offered under paragraphs 5.2.4 and 5.2.5 may present two one-year programmes, or a two-year programme, of their own choice to the Curriculum Committee for scrutiny and approval. The Dean shall act as the Advisor for such students and neither registration nor subsequent class changes may be made without his prior approval.

5.2.7 Transfer Between Programmes
Students who transfer at the beginning of their third year from or into a Major Programme must meet the requirements under either paragraphs 5.2.4 or 5.2.6, and may declare a new major subject.

5.3 Honours Programmes
Able and ambitious students are urged to enter an Honours Programme. These programmes entail a higher quality of work than that required for a major programme. There are two types of honours programmes: concentrated, involving a major concentration in a single discipline or a combined concentration in two related disciplines; and unconcentrated, involving breadth of study in several related disciplines. A student may usually transfer from an honours to a major programme without inconvenience. To this end the Honours candidate should include in the first year's programme one full-credit class from the list given in Section 5.1.1(c). Of classes in the second and third year, at least one class shall be in each of three subjects. *Students considering an honours course are advised to consult as soon as possible, preferably before their first registration, with the departments in which they may wish to do their advanced work.*

5.3.1 Acceptance
Honours students in a concentrated programme must be accepted by the major department concerned, which supervises their whole programme of study. Honours students in an unconcentrated programme must be accepted by the Programme Advisory Committee, which appoints an interdisciplinary advisory committee of two or more Faculty members to supervise the programme of study.

5.3.2 Application for Admission
Application for admission to an honours programme must be made in triplicate on forms that are available from the Registrar's Office. Students desiring to pursue a concentrated programme must submit these forms to the head of the department concerned.

5.3.3 Conversion to a Degree with Honours
Students who have received a B.A. or B.Sc. degree from Dalhousie and who are not enrolled in a programme of study in another Faculty, may apply for admission into an Honours programme. Regulations in paragraphs 5.3.1., 5.3.5, and 5.3.6. (or the regulations regarding the B.Sc. in Engineering-Physics) must be met. On satisfying the requirements of the Honours degree programme, students receive a certificate which converts their degree to a degree with Honours.

5.3.4 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. 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 major 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.* Paragraph 5.3.6.1 applies fully to such joint programmes.

5.3.5 Minimum Standing for Honours & First Class Honours
For the purpose of this regulation, "advanced classes" are those referred to in paragraphs 5.3.6.1(a)(i) and (ii), or 5.3.6.1(b)(i) or 5.3.6.2(a)(i).

(a) To count toward an Honours degree, each advanced class must be passed with a grade of at least C. Should D or C- be received, it must be made good by repeating the class and achieving a C or better grade or by taking an additional advanced class (preferably in the same subject). Otherwise the student must transfer out of the Honours programme.

(b) In five of the advanced classes in a student's Honours programme, a grade of B or better must be achieved, and in three additional advanced classes, a grade of B- or better is required. For first class Honours, students must achieve either:
(i) grades of A or better in four advanced classes and of A- or better in four additional advanced classes, OR
(ii) grades of A or better in six advanced classes and of B or better in all advanced classes.

(c) Students who have not obtained a grade of B- or better in five advanced classes will not be admitted to the fourth Honours year without explicit Departmental recommendation and prior approval of the Committee on Studies.

(d) The Honours Qualifying Examination must be passed; unless Pass-Fail grading is employed, the grade must be B- or better - and for first class Honours, A- or better.

5.3.6 Requirements for the Second, Third, and Fourth Years

5.3.6.1 Concentrated Honours Programme
(a) Honours in a *major programme* are based on the general requirement that the 15 classes beyond the first year of study comprise:
(i) A normal requirement of nine classes beyond the 100 level in one subject (the major subject). Students may, with the approval of the department concerned, elect a maximum of eleven classes in this area. In this case (iii) below will be reduced to two or three classes.
(ii) two clases in a minor subject satisfactory to the major department, and
(iii) four classes not in the major field.

(b) Honours in a *combined programme* are based on the general requirements that the 15 full credit classes or the equivalent half-credit classes, beyond the first year of study comprise:
(i) a normal requirement of eleven classes beyond the 100 level in two allied subjects, not more than seven classes being in either of them. Students may, with the approval

of the departments concerned, elect a maximum of thirteen classes in two allied subjects, not more than nine classes being in either of them. In this case the requirement in (ii) below is reduced to two classes.
(ii) four classes in subjects other than the two offered to satisfy the requirement of the preceding clause.

(c) At the conclusion of an honours programme students' records must show a grade which is additional to those for the required twenty classes. This grade may be obtained through a comprehensive examination, the presentation of a research paper (which may be an extension of one of the classes), or such other methods as may be determined by the major department (subject to the approval of the Committee on Studies). The method by which this grade is obtained is referred to as the honours qualifying examination.

(d) Departments may elect to use a pass-fail grading system for the honours qualifying examination.

Details of specific departmental honours programmes will be found under departmental listings of *Programmes of Study*.

5.3.6.2 Unconcentrated Honours Programme
(a) Honours in the unconcentrated programmes are based on the general requirement that the fifteen full credit classes, or the equivalent in half-credit classes, beyond the first year of study comprise:
(i) twelve classes beyond the 100 level in three or more subjects. No more than five of these may be in a single subject; no less than six and nor more than nine may be in two subjects.
(ii) three other classes.

(b) Requirements for an Unconcentrated B.A. (Honours)

At least ten classes of the twenty selected must be selected from groups A, B, and C.

(c) Requirements for an Unconcentrated B.Sc. (Honours)

At least eight classes of the twenty required must be selected from Biology, Biochemistry, Chemistry, Computing Science, Geology, Mathematics, Microbiology, Physics, Psychology, and Statistics, and at least six additional classes must be selected from groups C and D.

(d) At the conclusion of an Unconcentrated Honours programme students' records must show a grade which is additional to those for the required twenty classes. This grade must 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 methods as may be determined by the committee or departments supervising the student's programme (subject to the approval of the Committee on Studies). The method by which this grade is obtained is referred to as the honours qualifying examination.

(e) Departments may elect to use a pass-fail grading system for the honours qualifying examination.

5.4 Counting of Classes toward Two Undergraduate Degrees
(a) 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:
(i) only classes that are applicable to the course for the second degree may be counted for credit;
(ii) each class carried forward must bear a grade of C or higher;
(iii) a minimum of six new full credit classes must be taken, four of which must be above the 1000 level in a new area of concentration and two normally in other subjects;
(iv) merit points must be scored on the new classes as required by Regulation 3 above;
(v) Students intending to gain a second undergraduate degree should consult with the department in which the new major classes will be taken in the planning of their programme of studies. Application must be made to the Registrar prior to enrolling in any of the six classes which constitute the minimum additional requirement. This application must give details of the proposed programme and must be supported by the new major department.

(b) Students who hold one undergraduate degree from another recognized university, and who wish to gain a second undergraduate degree from Dalhousie University, must complete at least half of the classes for that degree at Dalhousie. Accordingly, they must meet the requirements set out in (a) above but must take a minimum of seven and one half full credit classes, at least four of which must be above the 1000 level in a new area of concentration, and at least two in other subjects.

Note: For students holding a B.Ed. (Vocational) degree and seeking a second undergraduate degree. General Faculty Regulation 5.1 does not apply to classes carried forward from their first degree. Of the new classes chosen:

(1) no more than one may be taken off-campus or in summer school,

(2) no more than one may be taken from the Education Foundation offerings, i.e. Education classes numbered below 4400, and

(3) six or more shall be above the 1000 level.

Note: Conversion of a B.A. or B.Sc. to a degree with honours (Degree Programmes, section 5.3.3) does not involve the award of a second degree, hence it is not subject to this regulation. However, graduates from other universities wishing to obtain degrees with Honours from Dalhousie must satisfy all the Dalhousie requirements for degrees.

6. Bachelor of Science in Engineering-Physics

This programme has been phased out at Dalhousie, and this university can admit no new students to it. A new joint Dalhousie/Technical University of N.S. degree has been instituted and reference should be made to the Department of Engineering-Physics at the latter institution.

7. Engineering

(a) Diploma in Engineering
Two Years - 11 credits.

The professional degree in Engineering is the Bachelor of Engineering Degree which is conferred by the Technical University of Nova Scotia in association with Dalhousie University. Students desiring to pursue a career in Engineering may qualify over a period of five years.

The first two years of study are taken at Dalhousie and comprise a programme of 11 credits which lead to the Diploma in Engineering. Upon successful completion of this Diploma programme, students will be admitted to the Technical University of Nova Scotia for a further three years of study leading to the degree of Bachelor of Engineering.

(b) Bachelor of Science
Three Years - 15 credits.

Students may combine studies for the Diploma in Engineering with a programme leading to a Bachelor of Science Degree with a major in Biology, Chemistry, Computing Science, Geology, Mathematics or Physics, with Engineering classes acting as minor classes. Successful students are eligible to apply to the Technical University of Nova Scotia to continue studies towards the Bachelor of Engineering Degree. Alternatively, students may apply for admission to an honours programme at Dalhousie.

8. Bachelor of Music

Four Years - 21 classes including graduation requirement.

Special requirements and descriptions are given under Music in *Programmes of Study*.

9. Bachelor of Education

Integrated (with B.A. or B.Sc.): four years - 22 classes, including field experience.

Integrated (with B.A. or B.Sc. with Honours): five years - 27 classes, including field experience.

Sequential: one year - (Secondary only) - 7 classes, including field experience.

By arrangement with the Nova Scotia Department of Education, students with senior matriculation completing the integrated B.A. of B.Sc./B.Ed. programme or the sequential B.Ed. programme may receive a Teacher's Certificate (Class 5). All other B.Ed. graduates should consult the Registrar, Nova Scotia Department of Education concerning certification and licensing.

The level of certification awarded upon completion of the B.Ed. programme for vocational teachers is dependent upon type of certification held on entering the programme. Graduates of this programme are advised to consult the Registrar, Nova Scotia Department of Education about certification and licensing.

Transfer of Credit:
Decisions concerning transfer of credit will be made following consideration of transcripts and students' intended areas of study.

Enquiries should be directed to the Secretary, B.Ed. programme.

Students who wish to obtain the degree of B.Ed. with transfer of previous credit must obtain the degree of B.A., B.Sc., or B.Com. and apply for admission to the B.Ed. programme. Graduates of non-degree granting Teachers' Colleges should note that the following guidelines are used in transfer of credit:

General Undergraduate Regulation 1.2 applies to such transfer of credit.

Graduates of an acceptable three-year programme must take an additional two and one-half classes.

Graduates of an acceptable two-year programme must take an additional three and one-half classes.

Graduates of an acceptable one-year programme must take an additional five classes.

The actual selection of *classes* is to be made to suit the needs of each student and the student is advised accordingly when the student's file is examined.

10. Bachelor of Music Education

Four years - 20 classes including field experience.

Details of the curriculum and requirements for admission to the course are given under *Music* in *Programmes of Study*. The *B.Mus.Ed.* leads to Certification by the Nova Scotia Department of Education.

11. Commerce and Public Administration

Detailed requirements for admissions and programmes are set forth in the section of this calendar dealing with the Dalhousie University Faculty of Administrative Studies.

12. Dentistry

Detailed requirements for admission are set forth in the Calendar of the Dalhousie University Faculty of Dentistry. Candidates are encouraged to proceed to a Bachelor's degree before seeking admission.

12.1 Entrance Requirements
The minimum academic course must include university classes in English, biology, general chemistry, organic chemistry and physics, each of an academic year's duration. The science classes must include laboratory instruction or seminar periods. Credit for the remaining five classes may be obtained in either of the following ways:

(a) by the successful completion of two classes chosen from the humanities and the social sciences plus three other elective classes.

(b) by Bachelor's degree. If an applicant has a Bachelor's degree in a course acceptable to the Faculty of Dentistry, it is assumed that a suitable selection of classes has been included in the degree programme.

12.2 Dental Aptitude Tests
All Canadian applicants must submit the results from the Canadian Dental Association Dental Aptitude Testing Programme. Information regarding the Dental Association Aptitude Testing Programme may be obtained from the office of the Registrar, or by writing to the Administrator, Dental Aptitude Test Programme, The Canadian Dental Association, 234 St. George Street, Toronto M5R 2P2.

Applicants from other countries may submit the American Dental Association Dental Aptitude Testing Programme results. While this information will not be a final or deciding factor in selection it will be used as an additional criterion by the Admissions Committee when evaluating student qualifications.

13. Medicine

Detailed requirements for admission are set forth in the Calendar of the Dalhousie University Faculty of Medicine. The majority of students accepted for admission to that Faculty have a bachelor's degree, but this is not a requirement.

13.1 Entrance Requirements
At a minimum, applicants pursuing a premedical course in the Faculty of Arts and Science to which they have been admitted on the basis of Nova Scotia Senior Matriculation (or the equivalent) including credits in English and mathematics, are required to have completed ten classes in a regular degree programme prior to June 10 of the year of expected entrance.

(a) Five of these classes are mandatory, namely: English 100, Biology 1000 or 2000, Chemistry 110, or 111, or 112, or 120, and 240 and Physics 1000, 1100 or 1300 or any equivalent classes.

(b) The remaining five classes must include at least two in a single subject. Ordinarily these five electives should be chosen from the following: anthropology, biology, chemistry, classics or classical languages, economics, English, history, mathematics, modern languages, philosophy, physics, political science, psychology or sociology.

All elective classes should, if possible, be selected so as to conform to the degree requirements of the applicant's university.

13.2 Medical College Admission Test
Results of this test must be submitted by all applicants.

14. Architecture

Qualification for entrance to the School of Architecture at the Technical University of Nova Scotia is the satisfactory completion of at least two years at a university or equivalent institution recognized by the Faculty of Architecture. A university course in mathematics is prerequisite, except that the applicant may instead be required to take a written examination in this subject.

Providing it has been undertaken at a recognized university, virtually any course of studies, including arts, fine arts, engineering and other technologies, science, agriculture, social science, education, medicine, is acceptable.

Candidates for admission to the first year in architecture should submit to the Assistant Dean of the Faculty of Architecture of Technical University of Nova Scotia by July 1 the following documents:
(a) an application form obtained from the Faculty of Architecture;
(b) an official transcript of their university record;
(c) a letter of recommendation from some person of academic rank, preferably the Dean or Head of Department, with close personal knowledge of their academic background.

15. Design

Students successfully completing one year of a B.A. programme in the Humanities of 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.

16. International and Exchange Programmes

The Faculty of Arts and Science participates in a number of official programmes to enable students to pursue part of their studies in another country. Two different types of programmes are available: a) Co-ordinated Programmes, which usually extend over one term and are composed of a set of agreed classes in the language and culture of the country concerned and b) Integrated Programmes which usually extend over a full academic year and enable students in the third year of an honours programme to take an appropriate selection of the regular classes offered by the co-operating university. The curricula of the latter programme must be approved in advance by the departments which offer the honours programme at Dalhousie. Any unavoidable changes in a prescibed programme made during the course of the study abroad should be reported immediately to the Programme Co-ordinator, or problems may occur with the transfer of credits to the Dalhousie degree programme. For the purpose of exchange/study abroad programmes, the normal workload at the host university shall be deemed to be equivalent to the normal workload at Dalhousie.

The numbers of students in these programmes is strictly limited, so those who are interested should contact one of the Co-ordinators listed below as early as possible.

16.1 Co-ordinated Programmes

Pushkin Institute, Moscow/Leningrad University, Leningrad, U.S.S.R. (Spring Term)
Dr. Ieva Vitins, Russian Department

Colegio de Espana, Salamanca, Spain (Fall Term)
Dr. Antonio Ruiz-Salvador, Spanish Department

16.2 Integrated Programmes

Université d'Aix-en-Provence, France (Academic Year)
Dr. W.T. Gordon, French Department

University of Stirling, Scotland (Academic Year)
Dr. James Gray, English Department

General information on International Programmes may be obtained from the Associate Dean, Faculty of Arts & Science.

16.3 Exchange Programmes

Students in the second year of a three-year B.A. or B.Sc. programme or in the second year or third year of a four-year honours programme who can demonstrate fluency in French may apply for a Letter of Permission to participate in an exchange programme with the Université du Québec à St. Foy, Chicoutimi and Trois Rivères.

PROGRAMMES OF STUDY AND CLASSES OFFERED

The class listings given under the various programmes represent an accurate listing of classes expected to be available in the year 1984/85. The Timetable, published in March 1984, will give a precise listing of the classes available in 1984/85, noting additional classes, deletions, and staffing changes.

Classes marked with * are not offered every year, consequently the Timetable should be consulted to ascertain whether the class will be offered in 1984/85, and the relevant department should be consulted before such classes are included in programmes planned in advance.

It should also be noted that separate timetables are published listing summer session offerings, which vary from year to year. The relevant department should be consulted before summer session classes are included in programmes planned in advance.

Departments typically indicate the structure of the various programmes they offer in their departmental calendar entry. Further information is always available from the relevant department. All relevant faculty regulations are available in this Calendar, and must be satisfied along with the required departmental regulations.

Before planning a course of studies, the relevant departments should be consulted in case any changes in course offerings have taken place since the Calendar was printed.

African Studies

Professors
J.H. Barkow (Sociology & Social Anthropology)
J.E. Flint (History)
E. Gold (Law)
K.A. Heard (Political Science)
R.I. McAllister (Economics)
P.D. Pillay (History)
A.M. Sinclair (Economics)
R.J. Smith (English)
J.B. Webster (History)

Associate Professors
T. Pinfold (Economics)
T.M. Shaw (Political Science)

Assistant Professor
L. Osberg (Economiccs)

Killam Fellow
Ann McDougall

The undergraduate programme in African Studies offers an opportunity to integrate classes from a number of disciplines. The major focus is Africa; the minor focus is development. Five classes beyond the first year deal with African cultures, economics, history, literature and politics; the remaining classes are concerned with development and change.

Students wishing to read towards a B.A. with a concentration on African Studies should note the following recommendations and regulations:

1. It is strongly recommended that in the first year students should read three of: Anthropology 100, Economics 1100, English 100, History 1400, Political Science 1100, 1101, or 1103.

2. In the second and third years at least seven of the ten required for a degree must be chosen according to the following regulations:
a) African Studies 200 (compulsory)
b) Four classes to be chosen from List I below (direct focus on Africa)
c) A further two classes must be chosen from List I or List II, the latter list being classes concerned with the problems of development and underdevelopment.
d) Two of the ten classes must be at the 300 level.

200 - Problems in Modern Africa

This class provides a general and comprehensive introduction to contemporary issues and institutions in Africa. It concentrates on the current political, social and economic scene. Topics include contemporary history, social change, problems of development, and prospects for unity. Illustrations are drawn from sub-Saharan Africa, although the class provides an overview of current questions and concepts relevant to the continent as a whole.

LIST I

(See respective disciplinary sections of the calendar for class descriptions. Note that not every class is offered each year.)

Economics 2234A, Pre-Colonial Economic History of Sub-Saharan Africa

Economics 2235B, Economic History of Tropical Africa: Colonial Period

Economics 3337B, Recent Economic Developments in Sub-Saharan Africa

English 217, African Literature

History 1400, Europe and the Third World

History 2400, History of Tropical Africa

History 3450, History of South Africa

Political Science 3315A, African Politics

Political Science 3345A/5345A, South Africa: The Dynamics of Groups and Group Domination

Political Science 3540B/5540B, Foreign Policies of African States

Political Science 3544B/5544B, Conflict and Cooperation in Southern Africa

LIST II

Sociology and Social Anthropology 2400, Medicine & Health

Sociology and Social Anthropology 3060B, Modernization and Development

Economics 2250/4440, Applied Development Economics

Economics 3333A, Theories of Economic Development

Economics 3341A, Urban Economics: Growth and Development of Urban Areas

History 3360, Enslavement and Emancipation: Afro-Americans in the U.S. South to 1900

History 2130, British Empire and Commonwealth

Political Science 2300, Comparative Politics

Political Science 3340A/5340A, Problems of Development: The Politics of New States

Political Science 2500, World Politics

Political Science 3531A/5531A, The United Nations in World Politics

Political Science 3535A/5535A, Towards a New World Order

Ancient History

See under **Classics**

Anthropology

See under **Sociology and Anthropology.**

Architecture

100 Introduction to Architecture, lect./sem.: 1 hr. prac.: 2 hrs. L. Richards

An introductory class showing architecture as a bridge between the Arts and Science providing an insight into professional architectural studies. In the first term discussion centres around some components of architectural design; in the second term, architecture in present day life. Available as an elective in the general degree programmes in Arts and Science.

Art History

Classes Offered

101
Details not available at time of publication.

Biochemistry

Head of Department
R.W. Chambers

Professors
A.H. Blair, B.A., M.Sc. (U.B.C.), Ph.D. (Calif.)
R.W. Chambers, B.A., Ph.D. (Calif.)
W.F. Doolittle, A.B. (Harv.), Ph.D. (Stan.)
M.W. Gray, B.Sc., Ph.D. (Alta.)
C.W. Helleiner, B.A., Ph.D. (Tor.)
C.B. Lazier, B.A. (Tor.), M.Sc. (U.B.C), Ph.D. (Dal.)
S.J. Patrick, B.A., Ph.D. (Tor.)
D.W. Russell, B.Pharm., Ph.D., D.Sc. (Lond.), B.Ed. (Dal)
S.D. Wainwright, B.A. (Cantab.), Ph.D. (Lond.)

Associate Professors
W.C. Breckenridge, B.Sc. (Kingston), M.Sc., Ph.D. (Tor.)
P.J. Dolphin, B.Sc., Ph.D. (Southampton)
R.G. Fenwick, B.A. (Miami), Ph.D. (Tennessee)
F.I. Maclean, B.A., M.A. (Tor.), D.Phil. (Oxon.)
C. Mezei, M.Sc., Ph.D. (U.B.C.)
F.B. Palmer, B.Sc., Ph.D. (W.Ont.)
R.A. Singer, A.B. (Princeton), Ph.D. (Harv.)
J.A. Verpoorte, B.Sc., Drs. (Utrecht), D.Sc. (Pretoria)

Assistant Professors
M.W. Spence, M.D. (Alta.), Ph.D. (McG.)
L.C. Stewart, B.Sc., M.Sc. (McG.)
M.H. Tan, B.Sc., M.D. (Dal.)

Lecturers
D.E.C. Cole, B.Sc., M.D. (Tor.), Ph.D. (McG.)
H.W. Cook, B.Sc., M.Sc. (McG.), Ph.D. (Dal.)
E.S. MacFarlane, B.Sc., M.Sc., Ph.D. (Dal.)
R.A. Mulroney, B.Sc. (Ott.), P.Dt. (Montreal), M.Sc. (Wisc.)

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 the student with an up-to-date view of modern biochemistry ranging from structure-function relationships in macromolecules to the dynamic aspects of metabolism and genetic information transfer.

Degree Programmes

There is no three-year programme with a Biochemistry major. Students wishing to include Biochemistry in other three-year programmes should take Biochemistry 2000 and 2600 in their second year. Note that all Biochemistry classes have prerequisites.

B.Sc. with Honours in Biochemistry

This is a special Concentrated Honours Programme. Because Biochemistry and Chemistry are closely interwoven both conceptually and experimentally, the list of major classes required (see section 5.3.6.1(a)(i)) includes both subjects to a total of 10½ credits. Students are also strongly urged to include Mathematics 106 and Biology 2030 and 2100 in their programmes, and should consider also Biology 3070.

Year I: Chemistry 110; Biology 1000; Physics 110; Mathematics 100 & 101; a "Writing Class" (see section 5.1.1(c)).

Year II: Biochemistry 2000 and 2600; Chemistry 211, 220, 230 & 240; and one full credit in the minor subject.

Year III: Biochemistry 3200, 3300 & 3400; Chemistry 341 & 343; one half-credit "A" term elective (any subject); one full credit elective (not Chemistry or Biochemistry); and one full credit in the minor subject.

Year IV: Biochemistry 4602; three more full credits in Biochemistry, including at least one half-credit in each of the following areas: Metabolism (43xx), Molecular Biology (44xx), and Physical Biochemistry (47xx); one full credit elective (not Chemistry or Biochemistry).

A minor subject (see section 5.3.6.1(a)) may be chosen from among Biology, Mathematics, Microbiology, Physics, and (with some restrictions) Psychology. A Chemistry minor is not an option but an Honours Programme in Biochemistry and Chemistry combined is available.

B.Sc. with Combined Honours in Biochemistry and another science area

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

Consult the Department for details.

Programme in Molecular Biology

A coordinated programme in Biochemistry, Biology, and Microbiology. Consult with one of these Departments for details.

Classes Offered

The Department also teaches students in Dental Hygiene, Dentistry, Medicine and Nursing; these classes are described in the appropriate sections of the Calendar.

2000 (Biology 2015) Cell Biology and Biochemistry, lect. 3 hrs., Biology and Biochemistry faculty members. *Prerequisites:* Biology 1000 and Chemistry 110.

Described under Biology 2015. Students planning to take advanced work in biochemistry and molecular biology need this class as a prerequisite.

2600A or B (Biology 2012 A or B) Laboratory Techniques for Cell and Molecular Biology, lect. 1 hr., tutorial 1 hr., lab. 3 hrs., Biology Department members. *Prerequisites:* Biology 1000 and Chemistry 110.

Described under Biology 2012. Students planning to take advanced work in biochemistry and molecular biology need this class as a prerequisite.

3100 Biochemistry for Students of Pharmacy, lect. 3 hrs., D.W. Russell, lab. 3 hrs., L.C. Stewart

For pharmacy students in their third year.

3200A (Biology 3012A) Introduction to Biological Chemistry, lect. 2 hrs., tutorial 1 hr., lab. 3 hrs., A.H. Blair, J.A. Verpoorte, C. Mezei, L.C. Stewart. *Prerequisites:* Biochemistry 2000 (Biology 2015), Biochemistry 2600 (Biology 2012) and Chemistry 240, or equivalents.

This class deals with chemical principles governing biochemical systems. We discuss the factors that determine how readily a given metabolic reaction proceeds and describe how these factors may be expressed quantitatively. This is followed by a discussion of basic principles governing the structure of proteins. We also deal with the ways in which proteins bind other molecules, often with high affinity and specificity. Finally, 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. This class, or its equivalent, is a prerequisite for all subsequent classes in biochemistry.

3300B (Biology 3013B) Intermediary Metabolism, lect. 2 hrs., tutorial 1 hr., W. Kimmins, F.B. Palmer; lab. 3 hrs., P.J. Dolphin. *Prerequisite:* Biochemistry 3200A (Biology 3012).

Emphasis is chiefly on metabolic pathways common to all organisms, notably the reductive synthesis and oxidative catabolism of carbohydrates, lipids, and some nitrogen compounds. Other pathways, significant in certain tissues or organisms, are included. Metabolic regulation is surveyed, and factors influencing the rate at which compounds flow through selected pathways are examined. Students learn how pathways are compartmentalized, interrelated, and affected by abiotic chemical changes in the environment. Laboratory excercises demonstrate the strategises and techniques used to study metabolic pathways. Tutorial time is used to solve problems and for student presentations.

3400B Biology 3014B) Nucleic Acid Biochemistry and Molecular Biology, lect. 2 hrs., tutorial 1 hr., M.W. Gray, C.W. Helleiner, R.W. Lee; lab. 3 hrs., M.J. O'Halloran. *Prerequisite:* Biochemistry 3200 (Biology 3012).

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, transcription, and translation. In this context, nucleic acid biochemistry is emphasized as a basis for understanding storage and transfer of biological information.

4300 Series: Intermediary Metabolism and Control

These half-credit classes continue the study of metabolism begun in Biochemistry 3300, and introduce also some specialized topics of particular interest. Emphasis is on how metabolic systems are related and how the systems and their relations are controlled. Appraisal of experimental evidence and interpretation of data are stressed.

4300A Biochemistry of Carbohydrates and Nitrogen Compounds, lect. 2 hrs., W.C. Breckenridge and F.B. Palmer. *Prerequisites:* Biochemistry 3200 and 3300 (Biology 3012 and 3013).

A functioning organism must control and integrate its metabolism. This principle is illustrated by first studying how carbohydrate metabolism supplies both energy and structural components. Topics include enzyme localization, mitochondrial permeability, modified oxidative cycles, and biosynthesis of oligo- and poly-saccharides, aminodeoxy-sugars, and glycoproteins. The main focus of nitrogen biochemistry is on feedback and indirect methods of controlling amino acid metabolism. Non-ribosomal synthesis of peptides and peptidoglycans is also described.

4301B Biochemical Communication: Membranes, Neurotransmitters, and Hormones, lect. 2 hrs., C. Lazier, F.I. Maclean, and C. Mezei. *Prerequisites:* Biochemistry 3200, 3300, and 3400 (Biology 3012, 3012, 3014) or equivalent, or special permission of the instructors.

First, the class examines evidence for current concepts of membrane structure and assembly. Then several membrane-related phenomena are studied; among others, ways for transporting solutes across membranes, and effects that depend on membrane-associated receptors such as neurotransmission and peptide hormone action. Regulation that does not depend on membranes, such as steroid hormone action, is considered in detail.

4302A Biochemistry of Lipids, lect. 2 hrs., F.B. Palmer and others. *Prerequisites:* Biochemistry 3200 and 3300 (Biology 3012 and 3013).

The chemistry and physics of insoluble lipids in an aqueous environment are explored. Current evidence on the physical state of lipids in organisms is examined, and problems in the interaction of insoluble lipids with soluble and insoluble enzymes are considered. Metabolism of a variety of lipids is studied, especially of those that may have specialized physiological functions, including glycolipids, fatty-acid derivatives like prostaglandins and thromboxanes, steroids, phospholipids, etc.

4303C Biochemical Energetics, lect. 1 hr., F.I. Maclean. *Prerequisites:* Biochemistry 3200 and 3300 (Biology 3012 and 3013).

Approximately equal time is given to the following topics: thermodynamic principles of special importance to biochemistry and to biological "information"; fermentations; autotrophy and photosynthesis; oxidative phosphorylations; energy metabolism of protozoa and invertebrates.

***4400 Protein Synthesis and Control Mechanisms,** lect. 2 hrs., S.D. Wainwright. *Prerequisites:* Biochemistry 3200 and 3400 (Biology 3012 and 3014) or special permission of the instructor.

The class deals with the cell components and reactions involved in the biosynthesis of proteins, with special reference to mechanisms controlling the rate of synthesis and the spectrum of proteins made. Students' individual study of research reports is emphasized.

4403A & 4404B Molecular Biology of the Gene

These half-credit classes consider the duplication, transfer, and expression of genetic material. The experimental evidence for current concepts of gene structure and function is stressed. Students learn the language of molecular biology and the experimental techniques peculiar to it. Lectures adopt a historical perspective so that students come to appreciate how the discipline of molecular biology has developed.

4403A Structure, Organization, and Replication of Genes, lect. 2 hrs., M.W. Gray, C.W. Helleiner, and S.D. Wainwright. *Prerequisites:* Biochemistry 3200 and 3400 (Biology 3012 and 3014).

Topics include basic molecular genetics; evaluation of genetic complexity and gene arrangement; chromosome structure; identification and enumeration of specific genes; mechanisms of replication, recombination, and repair; and manipulation of genes *in vivo* and *in vitro* ("genetic engineering").

4404B Gene Expression, lect. 2 hrs., W.F. Doolittle, R.A. Singer. *Prerequisite:* Ordinarily, Biochemistry 4403A.

Topics include relationship between gene structure and function; RNA transcription and processing; the genetic code and translation of messenger RNA; and regulation of protein synthesis. Appropriate prokaryotes, eukaryotes, and viruses that illustrate different modes of gene expression are dealt with.

4602 Honours Project & Thesis, lab. 6 hrs., J.A. Verpoorte.

Students undertake a small research project supervised by a Faculty member, and present a written report.

4700A Physical Biochemistry, lect. 2 hrs., J.A. Verpoorte. *Prerequisites:* Biochemistry 3200 and 3300 and 3400 (Biology 3012 and 3013 and 3014) plus a basic class in physical chemistry or permission of the instructor.

Selected aspects of the chemistry of biological macromolecules, such as proteins, are considered. Topics include discussions of relationships of structure to bioactivity, the forces that stabilize structure, and chemical and physical methods used to isolate and study macromolecules.

4701B Enzymes, lect. 2 hrs., A.H. Blair. *Prerequisite:* Biochemistry 3200 (Biology 3012).

Our current understanding of enzymic catalysis and its experimental basis are examined. The relationship between structures of catalytic and regulatory sites and their functions are considered for selected enzymes. The kinetics of enzyme-catalysed reactions are studied, as is the way in which binding of regulatory molecules influences kinetic behaviour and thereby regulates cellular metabolism.

***4800 (Pathology 501) Clinical Medical Biochemistry,** lect. 2 hrs., lab. 3 hrs., Pathology faculty members. *Prerequisite:* Biochemistry 3200 (Biology 3012).

Consult Pathology Department.

4801 (Biology 4401) Introduction to Pharmacology

Consult Pharmacology Department.

8880 Honours Qualifying Examination

Honours students must fulfil the requirements of this class (see 5.3.6.1(c)) by presenting orally a Progress Report and a Final Report, on their work in Biochemistry 4602, at special Departmental seminars.

Biology

Chairperson of Department
B.K. Hall

Professor emeritus
D. Pelluet, M.A. (Toronto), Ph.D. (Bryn Mawr), LL.D. (Hon. Dal.)

Professors
R.G.S. Bidwell, M.A., Ph.D. (Queens), F.R.S.C. - *Killam Research Professor*
R.G. Brown, M.Sc. (McG.), Ph.D. (Rutgers)
M.L. Cameron, M.Sc. (Dal.), Ph.D. (Cantab.) - *George S. Campbell Professor*
A.R.O. Chapman, Ph.D. (Liv.)
R.W. Doyle, M.Sc. (Dal.), Ph.D. (Yale)
J. Farley, M.Sc. (W.Ont.), Ph.D. (Man.)
J.C. Fentress, B.A. (Amherst), Ph.D. (Cantab.) - *(Psychology)*
E.T. Garside, M.A., Ph.D. (Tor.)
L.E. Haley, M.S.A. (Tor.), Ph.D. (Calif.)
B.K. Hall, Ph.D., D.Sc. (U.N.E.)
O.P. Kamra, M.S. (N.Car.State), Ph.D. (Wash. State)
W.C. Kimmins, Ph.D. (Lond.)
K.E. von Maltzahn, M.S., Ph.D., (Yale) - *Carnegie Professor, King's*
I.A. McLaren, M.Sc., (McG.), Ph.D. (Yale)
E.L. Mills, M.S., Ph.D. (Yale) - *(Oceanography)*
R.K. O'Dor, A.B. (Berkeley), Ph.D. (U.B.C.)
J.G. Ogden, III, M.A. (Tenn.), Ph.D. (Yale)
E.C. Pielou, Ph.D., D.Sc., F.R.S.A. (Lond.)
L.C. Vining, M.Sc. (Auck.), Ph.D. (Cantab.), F.R.S.C.
E. Zouros, M.Sc. Ph.D. (Agri. Coll. Athens), Ph.D. (Chic.)

Associate Professors
E.W. Angelopoulos, M.S., Ph.D. (Minn.)
A.J. Hanson, M.Sc. (U.B.C.), Ph.D. (U. Mich.) I.E.S.
M.J. Harvey, Ph.D. (Dunelm)
G.S. Hicks, M.Sc. (Carl.), Ph.D. (Sask.)
P.A. Lane, M.Sc. (S.U.N.Y. Binghampton), Ph.D. (S.U.N.Y. Albany)
R.W. Lee, M.A. (Mass.), Ph.D. (S.U.N.Y. Stony Brook)
R.P. McBride, M.Sc. (U.B.C.), Ph.D. (Edin.)
R.G.L. McReady, M.Sc. (Alta.), Ph.D. (Calg.)
J.A. Novitsky, B.Sc. (Penn. St.), Ph.D. (Ore. S.U.)
D.G. Patriquin, M.Sc., Ph.D. (McG.)
M. Schrampf, Ph.D. (Stuttgart-Hohenheim)
J.H.M. Willison, Ph.D. (Nottingham)

Assistant Professors
B. Freedman, M.Sc., Ph.D. (Tor.)
T.H. MacRae, M.Sc., Ph.D. (Windsor)
T.P. Mommsen, Ph.D. (Freiburg)
M.R. Rose, M.Sc. (Queens), Ph.D. (Sussex)
R.E. Scheibling, Ph.D. (McG.)

Assistant Professor (Research)
G.F. Newkirk, Ph.D. (Duke)

Adjunct Professors
D. Brewer, M.Sc., Ph.D. (Tor.), Atl. Reg. Lab, N.R.C.
J.D. Castell, M.Sc., Ph.D. (Oregon St.), Fish. & Mar. Serv.
J.S. Craigie, M.Sc., Ph.D. (Queens), Atl. Reg. Lab, N.R.C.
K.H. Mann, Ph.D. (Rgd.), D.Sc. (Lond.), F.R.S.C. Mar. Ecol. Lab, BIO

Honorary Research Associates
J.S. Bubar, Ph.D. (McG.), N.S. Agric. Coll.
R. Conover, Ph.D. (Yale), Mar. Ecol. Lab, BIO
B.T. Hargraves, M.Sc. (Alta.), Ph.D. (U.B.C.), Mar. Ecol. Lab, BIO
F.H. Harrington, Ph.D. (S.U.N.Y.), Psychol. Mt. St. Vincent
J. Kerekes, M.Sc. (Alta.), Ph.D. (Dal.), Can. Wildlife Serv.
S.R. Kerr, Ph.D. (Dal.), Mar. Ecol. Lab, BIO
W.S.G. Maass, Dr. rer. nat. (Tubingen), Atl. Reg. Lab, NRC
I.A. Meinertzhagen, Ph.D. (St. Andrews), Psych. Dept.
T.C. Platt, Ph.D. (Dal.), Mar. Ecol. Lab, BIO
R.K. Prange, Ph.D. (Guelph), N.S. Agric. Coll.
W.G. Stratton, Ph.D. (Guelph), N.S. Agric. Coll.
J.P. Van Der Meer, Ph.D. (Cornell), Atl. Reg. Lab, NRC
R.J. Wassersug, Ph.D. (Chic.), Anat. Dept.

Senior Instructors
P. Gerdes, B.Sc. (McG.), M.Sc. (U.W.O.)
P. Harding, B.A. (Tor.), M.Sc. (Dal.)
C. Knight, B.Sc., B.Ed., M.Sc. (Dal.)
M.J. O'Halloran, B.Sc. (South), B.Ed. (Dal.)

Instructors
C. Beauchamp, B.Sc. (Memorial)
J. Breckenridge, B.Sc. (Queen's)
T. Gallivan, B.Sc. (Coll. Cape Breton)
J. Holbrook, M.Sc. (Dal.)
A. Mills
C. Mofford, B.Sc. (McG.)

Postdoctoral Fellows
Z. Ahmed, M.Sc., Ph.D. (Dal.)
R.K. Bhatnagar, Ph.D. (Delhi)
R.S. Desharnais, Ph.D. (Rhode Is.)
R.L. Stephenson, B.Sc. (Trent), Ph.D. (Canterbury)

The programme offered by the department gives a basic training in the biological sciences which may serve as a preparation for graduate and professional work in biology, medicine, dentistry, pharmacy, the health professions, bio-engineering and education, agriculture, marine sciences, fisheries, aquaculture, forestry and environmental architecture and engineering.

Degree Programmes

The department offers classes leading to the B.A. and B.Sc. degree with a major in biology and to a concentrated or combined Honours B.Sc. and B.A. programmes and a B.Sc. Honours in Marine Biology programme. A student intending to study biology as his main subject should consult the department early in his course so that a proper programme can be worked out.

Areas of Specialization - Major and Honours
Many classes are available to students wishing to concentrate their studies in particular areas of biology. In some cases, the order in which classes are taken is important, but cannot be rigidly specified here because students may vary widely in their interests and requirements. For this reason, students are strongly urged to consult with an adviser in the biology department, whether they are planning a 3-year, 2-year or only 1-year programme in biology. Faculty advisers are available in the following fields (among others): *Molecular Biology*, W.C. Kimmins, L.C. Vining; *Microbiology*, R.G. Brown, J. Novitsky; *Genetics*, R.W. Doyle, R.W. Lee, L.E. Haley, O.P, Kamra, E. Zouros; *Ecology/Environmental Studies*, R.W. Doyle, B. Freedman, P. Lane, I. McLaren, J.G. Ogden; *Physiological/Cell Biology*, M.L. Cameron, T. MacRae, R.K. O'Dor, D. Patriquin, M. Willison; *Developmental Biology*, B.K. Hall, G.S. Hicks; *General Studies*, J. Farley, R.P. McBride, K.E. von Maltzahn; *Plant Biology*, M.J. Harvey, A.R.O. Chapman, M. Willison; *Animal Biology*, E.T. Garside; *Entomology & Parasitology*, E. Angelopoulos.

Honours Programmes
For entrance to graduate school an honours degree or equivalent four-year background is required. Some graduate schools require a reading knowledge of French, German or Russian. A thorough grounding in mathematics and physical sciences is as important as advanced undergraduate training in biology.

Students reading for Bachelors degrees with honours in biology must satisfy the general requirements for honours degrees (see paragraph 5.3 and paragraphs 5.3.6.1 and 5.3.6.2 of the general faculty regulations referring to academic programmes) and must arrange their course programmes as early as possible in consultation with the department. In the fourth year a programme will normally include Biology 4900.

Selecting an Honours Programme
The basic Biology Honours Programme provides a broad background in the biological sciences and enough flexibility to allow some degree of specialization in a variety of sub-disciplines. A suitable programme of this kind (e.g. cellular and developmental biology, cellular biology and genetics, ecology and evolution, etc.) worked out with an adviser and leading to a thesis in that area is excellent preparation for advanced studies.

Some students may wish to choose a Combined Honours Programme with Biochemistry, Chemistry, Economics, Geology, Mathematics, Microbiology, Psychology or Physics. These programmes must be worked out with the two departments. Students may be interested in programmes that are not oriented toward a traditional discipline but rather emphasize a broad knowledge. For them an Unconcentrated Honours Programme may offer the best preparation. Advice on these matters may be obtained in the department.

A. HONOURS IN BIOLOGY
Although individual students may work out their own programmes, some examples of common programmes are described below.

1. Programme in Environmental Biology
Under this heading we distinguish two programmes. They emphasize the skills necessary to understand organisms as they relate to their environments and provide a broadly based preparation for careers or advanced studies in such areas as fisheries, agriculture, forestry, parks, wildlife, landscape, environmental studies, etc. Because of the many differences between **terrestrial** and **marine** or **aquatic** environments, two separate programmes are available.

2. Programme in Human Biology
This programme provides a broad grounding in the fields of modern medical research and is suitable preparation for advanced studies in any of the medical sciences. Some specialization in a particular field is possible during the fourth year.

Honours students must attend a weekly Honours Seminar in their fourth year. Combined honours students doing thesis work in the Microbiology Department may participate in a Microbiology seminar series (weekly) in lieu of the Biology Department Honours Seminar.

3. Programme in Economics and Biology
The departments of Economics and Mathematics offer a coordinated programme

and a combined honours programme which is particularly applicable to students with an interest in ecology. Students interested in such a programme should take Biology 1000 and Economics 1100 in their first year. Subsequent classes should be chosen from: Biology 2046 or 2060, 3061, 3062, 3066, 3614, 3617, 4060, 4067, 4068, 4069, 4616, 4650; Economics 2200 or 2220, 2250, 3331, 3332.

4. Programme in Microbiology

The departments of Biology and Microbiology offer both an Honours and a 2-year coordinated programme in Microbiology. These programmes are designed for students entering their second year of study. Students interested in these programmes are advised to consult either of the departments concerned at their earliest opportunity. Faculty advisers are R.G. Brown (Biology) and D.B. Stolz (Microbiology). Note that classes that are cross listed between these two departments can be taken for either Microbiology or Biology credits.

5. Programme in Molecular Biology

The departments of Biology, Biochemistry and Microbiology are developing a co-ordinated programme in Molecular Biology. Students interested in such a programme should take the following classes in their first year: Biol. 1000, Chem. 110 or 120, Math 100/101, writing class, one elective. Physics 110 should be taken during the first or second year. Students should consult faculty advisors in their major departments for classes to be taken after the first year.

B. HONOURS IN MARINE BIOLOGY

The Biology Department recognizes the special needs of the rapidly expanding marine field and offers a B.Sc. Honours Degree in Marine Biology.

The programme is designed to provide a fundamental background in Biological Science while permitting concentration in Marine Biology. It prepares students for technical positions in Marine Biology and fisheries and for advanced research training in graduate school. It combines the resources of the Departments of Biology and Oceanography and other various marine-related sciences. Dalhousie is located very close to the sea coast, and these Departments are mainly in the Life Sciences Centre which has a complete flowing seawater system, the Aquatron. Other departments offer a selection of classes in Economics, resource ecology and politics of the sea. The following is the suggested selection of classes:

Year I Introductory Biology, Chemistry, Math and Physics, plus 1 Arts elective (writing class).

Year II Ecology, Cell Biology, Invertebrates, Ecosystems, or Fish Biology, Organic Chemistry or Molecular Biology, Statistics.

Year III Algae, Physiology of Marine Animals, Limnology, Aquatic Microbiology, Genetics, Fish Biology or Ecosystems, electives.

Year IV Honours thesis, Oceanography (Biological, Chemical and Physical, and Fisheries), electives.

Suggested Electives: Resource Ecology and Economics, Marine Microbiology, Ichthyology, Coastal Ecology, Politics and Law of the Sea, Marine Geology, Physiology of Plants, Algal Physiology, Animal Nutrition, Topics in Seaweed Biology, Topics in Animal Physiology, Fish Population Biology, Field Ecology, Biology of Phytoplankton and Zooplankton, Theoretical Population Dynamics, Ecosystem Analysis. Programme Co-ordinator, R.K. O'Dor.

Classes Offered - Major and Honours Programme

Please note that except in very special cases Biology 1000 is the prerequisite for all other classes in the biology department.

A class number that is suffixed by one of the letters A, B or C is a half-credit class. See comments on these classes under the heading Numbering of Classes under General Undergraduate Information and Regulations.

Biology classes may be grouped into four general types:

1. **Introductory Biological Principles** - Biology 1000. This class is designed as an introductory university-level class in biology for the student who has had no previous training in the subject as well as for those who have taken high school biology. **It is required for entrance to all other classes in the department.**

2. **Core Classes** These consist of three full-credit classes (Biology 2000, 2015 and 2046) and seven half-credit classes (Biology 2010-2060 and 2100). These classes are grouped into four categories as follows: *Category I,* Biol. 2010B, 2020A, 2015R; *Category II,* Biol. 2030A/B, 2050A/B; *Category III,* Biol. 2040B, 2060A, 2046R; and *Category IV,* Biol. 2000R, 2100A/B. *Note that all biology major and honours students must take at least two and a half credits from among these classes and that these credits must be chosen from not less than three of the four categories.* The material in these categories represents the irreducible minimum of biology required for a major student's knowledge, and students are urged to take as many of these basic classes as possible. Students may not take more than one full credit in Categories I and III. Biology 2012A or B is a half-credit class which is not a member of the core and thus cannot be counted toward fulfilling the core requirement.

3. **3000-Level Classes** Intermediate 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 core classes in biology totalling at least two full credits.

4. **4000-Level Classes** These classes are primarily for honours and graduate 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.

Introductory and Core Classes Offered

1000 Principles of General Biology, Study Centre 3 hrs.; Tutorial Quiz 1 hr./2 wks,; Lecture Assembly 1 hr.; I. McLaren, M.L. Cameron, L.C. Vining; Instructors, T.M. Gallivan, A.H. Mills.

Biology 1000 is given in an audio-tutorial format with the study centre open on a come-any-time basis from 9:00 a.m. to 9:30 p.m. The subject matter puts emphasis on those features common to all organisms. The class starts by considering the basic functions of whole organisms by studying a typical plant and a typical animal. Then the organism is examined in finer detail, considering the structure of cells, cell chemistry, energy needs, the coding system and protein synthesis. This leads to the topics of genetics, evolution, ecology, development and systematics in the second term.

Biology 1000 is the basic introductory class in biology. It is suitable for students who may have had no previous training in biology. **If you are a biology major Biology 1000 is the prerequisite for all other classes in the biology department,** regardless of previous backgrounds in biology. Under exceptional circumstances, students may apply to be exempted from taking Biology 1000.

1984 A Citizens Guide to the Biological Issues of our Times, Lect. 2 hrs.; Tutorial 1 hr.; R.P. McBride. For B.A. students only and cannot be used as a prerequisite for other biology classes.

An awareness and comprehension of major developments in biology sufficient for citizen involvement in science-society controversies. Studying topics with major social impact such as genetic engineering, environmental health hazards and modern agriculture, students acquire a scientific vocabulary, insight into the strengths and limitations of science, and an understanding of basic biological concepts.

2000 Diversity of Organisms, lect. 2 hrs., Tutorial 1 hr., lab. 3 hrs. D.G. Patriquin, R.K. O'Dor; Instructor, P. Harding. (Category IV).

An exploration of the great diversity of living organisms and those in the geological record. Format is primarily lecture and scheduled lab; some field trips and computer and A/V aided learning included.

2010B Molecular Biology, Lect. 3 hrs.; Lab. 3 hrs.; J.A. Novitsky, L.C. Vining; Instructor, C. Mofford. (Category I).

The organization and function of the living world in molecular terms. This class explores the biochemistry of heredity, growth and existence at a level that does not depend upon extensive knowledge of organic chemistry, although some background in chemistry is essential. It provides the fundamentals of a molecular approach to biology for students who do not anticipate pursuing molecular biology or biochemistry as their main interest.

2012A/B Laboratory Techniques for Cell and Molecular Biology, Lect. 1 hr.; Tutorial 1 hr.; Lab. 3 hrs.; W.C. Kimmins; Instructors, P. Gerdes, C. Mofford.

An introduction to techniques, equipment and the experimental approach to solving biological problems in the laboratory. Lectures present the theoretical background to laboratory experimentation. Tutorials aim mainly at developing an appreciation of experimental design and data analysis. Students intending to take more advanced biochemistry/molecular biology classes next year need this class and Biology 2015 as prerequisites.

Biology 2012A/B cannot be used as part of the biology major and honours requirement for 2-1/2 biology core-class credits.

2015 Cell Biology and Biochemistry (Biochemistry 2000), Lect. 3 hrs., R.K. O'Dor, T. MacRae, W.C. Kimmins (Biology); W.F. Doolittle, R.G. Fenwick, C.W. Helleiner, S.J. Patrick, D.W. Russell, R.A. Singer (Biochemistry); Instructors, P. Gerdes, C. Mofford (Category 1).

Members of the Biochemistry and Biology Department join in offering this introductory class which explores the full range of contemporary ideas in cell and molecular biology. The class deals with topics such as the transmission of genetic information, gene expression, growth, adaptation, cell division and differentiation at a mechanistic level and provides a broad perspective of metabolic processes associated with energy production, biosynthesis, transport and communication. It also seeks to explain the integration of these and other forms of biological activity through regulation of gene expression and the diverse cellular and metabolic control systems.

Students who intend to take more advanced biochemistry and molecular biology classes next year need this class and Biology 2012A/B as prerequisites. Biology 2015R and 2012A/B may be substituted for Biology 2020 and/or 2010 as prerequisites, but credit may not be given for both 2015 and either 2010 or 2020..

2020A Cell Biology: Structure and Function, Lect. 3 hrs.; Lab. 3 hrs.; T. MacRae; Instructor, P. Gerdes (Category 1). *Prerequisite:* High school chemistry.

An introduction to the eukaryotic cell through lectures and laboratories. Major cell components and activities are described at ultra-structural and molecular levels. The concept of the cell as an integrated structural/functional unit is developed.

2030A/B Genetics, Lect. 3 hrs.; Tut. 1 hr./2 wks.; L.E. Haley, O.P. Kamra, R.W. Lee; Instructor, J. Holbrook. (Category II).

This class examines a broad range of topics from the rapidly expanding field of genetics. Major organizational sections include: Chemical and structural features of genes and chromosomes, gene transmission, gene function and gene variation in populations and through time. Tutorials deal mainly with problem solving. All students must do a laboratory project involving *Drosophila* crosses.

2040B Evolutionary Biology, Lect. 3 hrs.; Tutorial 1 hr; Lab. open; E. Zouros; Instructor, C. Beauchamp, (Category III). *Prerequisite:* High school Algebra.

Lectures cover the following topics, with about equal time devoted to each: origin of life and the evolution of the eukaryotic cell; evidence for evolution and major evolutionary theories; mechanism of evolution with emphasis on natural selection; the evolution of populations and the origin of species; patterns in the fossil record; human evolution. A textbook and a collection of papers (about four papers per topic) supplement the lectures. The mathematical theory of evolutionary biology is studied in tutorials, which consists of a set of problems covering elements of population genetics and statistics.

2046 Ecology and Evolution, Lect. 2 hrs.; Lab./Tutorial 3 hrs.; R.W. Doyle, B. Freedman; Instructors, C. Knight, C. Beauchamp. (Category III). Credit will not be given for both 2046 and either 2040 or 2060.

The growth and regulation of population size, the genetic structure of populations and the ecological structure of plant and animal communities. Principles which apply on a short (ecological) time scale will be developed in parallel with the analogous principles which apply over much longer stretches of evolutionary time. Much of the laboratory and about one-quarter of the lectures are concerned with applied ecology; in particular, with the biological basis of fisheries and environmental management. The class integrates and adds to material from Biology 2040 and Biology 2060, providing a good foundation for further work in ecology and marine biology.

2050A/B Developmental Biology, Lecture/Discussion 3 hrs; lab. 2-1/2 hrs.; G.S. Hicks, B.K. Hall, J.H.M. Willison and staff. (Category II).

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 a variety of developing systems such as sea urchins, frogs, chick embryos and humans. Importantly the rules will be discussed in relation to several contemporary 'social concerns' such as human test tube fertilization, cloning, cancer and gene engineering. Laboratories stress the use of live material and give students practice with such techniques as test tube fertilization in echinoderms and tissue culture.

2060A Ecology, Lect. 3 hrs.; Lab. 3 hrs.; P.A. Lane; Instructor, C. Knight.

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 with each other and with their non-living world. This class also gives attention to the more specialized area of human ecology - the effects that people have on their surroundings. Three levels of ecology are studied: (1) Individuals, (2) Populations, and (3) Communities and Ecosystems. Labs and tutorials enlarge upon concepts presented in lecture. Students are instructed in elementary computer techniques and use the computer for some laboratories. This class provides a good foundation for further work in ecology and marine biology.

2100A/B Introductory Microbiology, Lect. 2 hrs.; Lab. 3 hrs.; D.B. Stolz (course co-ordinator), R.G. Brown, G.C. Johnston, J. Novitsky; Instructor, J. Breckenridge. (Category IV).

An introduction to the basic concepts of microbiology through lectures, laboratory sessions, demonstrations and films. Subjects include the uniqueness of microorganisms, their structure, growth and genetic regulation, as well as their involvement in other fields such as medicine, industry and ecology.

Intermediate Classes Offered

Intermediate classes are mainly for second- and third-year students. They may be taken before completion of the core of classes described above. Please notice, however, prerequisites for the classes listed below. Students registering for these classes will have completed, or be registered in, a minimum of 2 full credits at the 2000- level.

Classes marked with an asterisk (*) are offered in alternate years. Consult timetable for current year.

3012A (Biochemistry 3200A). Introduction to Biological Chemistry, Lect. 2 hrs., D.W. Russell; tutorial 1/2 hr.; various Biology and Biochemistry staff; Lab. 3 hrs., C. Mezei. *Prerequisites:* Biology 2015 (Biochemistry 2000), Biology 2012A/B (Biochemistry 2600A/B) and Chemistry 240 or their equivalent(s).

This class is described under Biochemistry 3200A. It is required as a prerequisite for Biology 3013B (Biochemistry 3300B) and Biology 3014B (Biochemistry 3400B) and all fourth-year biochemistry classes.

3013B (Biochemistry 3300B). Intermediary Metabolism, Lect. 2 hrs.; tutorial 1 hr.; W. Kimmins, F.B. Palmer. Lab. 3 hrs., P. Dolphin. *Prerequisite:* Biology 3012A (Biochemistry 3200A).

This class is described under Biochemistry 3300B.

3014B (Biochemistry 3400B). Nucleic Acid Biochemistry and Molecular Biology, Lect. 2 hrs.; tutorial 1 hr.; M.W. Gray, C.W. Helleiner and Biology Faculty; Lab. 3 hrs. M.J. O'Halloran. *Prerequisite:* Biology 3012A (Biochemistry 3200A).

This class is described under Biochemistry 3400B.

3020A Advanced Cell Biology, Lect. 3 hrs.; T. MacRae. *Prerequisite:* 2020A or 2015R or permission of instructor.

An opportunity to examine new concepts in cell biology and to evaluate established ideas in the context of recent findings. A limited number of interrelated current topics are discussed in lecture. Students must supplement lectures with assigned readings and discuss selected subjects in essays.

3023A Biological Ultrastructure, Lect. 2 hrs.; Lab. 3 hrs.; K.B. Easterbrook, D.B. Stoltz, J.H.M. Willison. *Prerequisites:* Biology 2015, or 2020A, or 2100A/B.

Fundamental aspects of the architecture of biological entities (including viruses, bacteria, protists, fungi, plants, and animals) at the "ultrastructural" level. Ultrastructure is considered to include both intracellular and extracellular organization in the size range lying between macromolecules and whole cells. The relationship between structure and function is a recurrent theme, with emphasis on selected organisms of general importance. Laboratories primarily familiarize students with the interpretation of micrographs. Techniques used in ultrastructure research are explained and demonstrated. Students wishing to be trained in particular techniques should subsequently register in Biol./Microb. 4024B.

3030B Advanced Genetics, Lect. 2 hrs.; Tutorial 1 hr.; Lab. 3 hrs.; L.E. Haley. *Prerequisite:* Biology 2030A/B.

The topics introduced in biology 2030A/B are dealt with in much greater detail with emphasis on the genetics of different organisms and the analysis of genetic crosses.

3031A Molecular Genetics of Eukaryotes, Lect. 3 . R.W. Lee. *Prerequisites:* Biology 2015 or 2010A/B and 2030A/B.

This class evaluates current knowledge about the molecular organization of eukaryotic genomes, with emphasis on the possible evolutionary and functional meaning of this organization and on modern experimental aproaches.

*** 3032B Cytogenetics,** Lect. 2 hrs.; Lab. 3 hrs.; O.P. Kamra. *Prerequisites:* 2030A or B, and Biology 2020A or Biol. 2015.

Detailed consideration of certain genetical and cytological mechanisms in relation to chromosomal modifications, gene mutations and evolution.

3033A Microbial Genetics, (Microbiology Dept.)

*** 3034B Biological Effects of Radiation,** Lect. 2 hrs.; Lab. 3 hrs.; O.P. Kamra.

A survey of current knowledge of the effects of ionizing radiation on biological material on three levels: physical, chemical and biological. In addition, methods of dosimetryy, autoradiography, somatic and genetic effects, radiomimetic chemicals and biolasers are discussed.

3035A Population and Quantitative Genetics, Lect. 2 hrs.; Tutorial 1 hr.; E. Zouros. *Prerequisites:* Biology 2030 or Biology 2040 or Biology 2046; Math 100 and Math 106 or permission of the instructor.

The following topics are covered: amounts and kinds of genetic variation in populations; genetic properties of populations, causes of evolution with emphasis on natural selection; genetic differentiation of populations. Data from actual research provides the material for exercises. Students doing research in genetics are encouraged to bring into class the results of their own research. A statistical analysis of such data may serve as a partial fulfillment of the requirements of the class.

3039A Human Genetics, Lect. 3 hrs.; Lab. 3 hrs.; O.P. Kamra and E. Zouros. *Prerequisite:* Biology 2030A or B.

For students of Biology and Medicine with special interest in human genetics. Topics include human cytogenetics and abnormalities, inborn errors, genetic risk induced by environmental factors; prediction and detection of genetic risk, genetic counselling; genetic and non-genetic factors in behavioural characters and multifactorial diseases; genetic variability; selection and genetic load in human populations; ethical and social issues associated with manipulation of human genetic pools. A background in basic genetics is assumed.

3051A Advanced Development, Lect. 2 hr., Lab. 3 hr., G.S. Hicks, B.K. Hall; Instructor, P. Young. *Prerequisite:* 2050A or B.

With reference to model experimental organisms now in use, the following subjects are reviewed critically: sex determination and human sexual development; cancer; aging; teratogenesis; epithelial-mesenchymal interactions; organogenesis; totipotency; applied development. Laboratories consist of two projects in which students learn a variety of techniques such as: culture of animal embryonic organs; preparation and analysis of histological sections; photographic techniques; plant tissue culture. Such exercises are beneficial to students going on to both professional and non-professional vocations including medicine, laboratory technology and teaching.

3061B Communities and Ecosystems, Lect. 2 hrs.; Tutorial 1 hr., Lab. 3 hrs. P.A. Lane. *Prerequisite:* Biology 2046 or 2060A.

Major concepts and recent advances in community-ecosystem ecology are stressed, beginning

with a historical overview of community ecology, and followed by a delineation of contemporary ecosystem problems, especially those pertinent to the area of environmental impact assesirst half experience in associated methodologies. In the second part of the term, three major approaches to ecosystem analysis are compared. The laboratory parallels the lectures and gives experience in analyzing ecosystem data and applying theoretical techniques. In the tutorials, broader issues of human ecology are debated using a set of essays on environmental issues.

3062B Behavioral Ecology, Lect. 2 hrs.; Tutorial 1 hr.; M.R. Rose, J.C. Fentress. *Prerequisites:* Biology 2046 or 2060/2040 (Biology majors); Psychology 200 (Psychology majors).

The class is divided into three sections: (A) Background—selection and behaviour: natural selection, group selection, kin selection; (B) Methods—general methodological problems, ultimate, mediate, and proximate causation, the comparative method, optimality theory, strategy polymorphism; (C) Modes of behaviour—gathering food, living in groups, intraspecific conflict, sex, parental care and development, co-operation, communication, coevolution, sapience.

3066A Plant Ecology, Lect. 2 hrs.; Lab. 3 hrs.; one/two field trips on weekends; B. Freedman. *Prerequisite:* Biology 2046 or 2060.

Various topics within the field of Plant Ecology are discussed. At the ecosystem level, we deal in depth with the cycling of energy and significant nutrients, and with succesional changes in these processes. At the autecological level we deal with plant population biology and demography, resource allocation, and physiological ecology. The plant environment is also described in terms of energy budgets, soils, and water availability.

3067A A Survey of Fish Biology, Lect. 2 hrs.; Seminar 1 hr.; T.P. Mommsen, R.W. Doyle, R.K. O'Dor. *Prerequisite:* Biology 2046 or 2060, Biology 2015 or 2020.

The topics covered include fish systematics, physiology, behaviour and ecology. The primary purpose is to prepare students for Honours research projects in fish biology and to provide the background necessary for entry to 4th-year courses such as Fisheries Population Biology, and Fisheries Oceanography. Although no laboratory is scheduled, practical and library research projects are required.

3069A Animal Population Ecology, Lect./Tutorial 2 hrs.; lab. 3 hrs.; I.A. McLaren. *Prerequisites:* Biology 2046 or 2060, Math 100, 101, 106.

Population ecology of a representative species is used to exemplify various demographic tactics and situations: a marine copepod for links with physiological ecology; an "out-break" insect for density-independence and questions of control; a passerine bird for density-independence and the adaptedness of demographic parameters; lemmings for cycles and "self-regulation" hypotheses; eastern Canadian seals for problems of management and control of long-lived species; cranes and condors for the demography of threatened species. The demography of "model" species is explored in the (open) lab sessions.

3070 Principles of Animal Physiology, Lect. 2 hrs.; Discussion 1 hr.; Lab. 3 hrs.; T.P. Mommsen, M.L. Cameron; Instructor M.J. O'Halloran. *Prerequisites:* Biology 2000 and 2020 or 2015 (in which a minimum C grade is required).

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.

3071 Physiology of Marine Animals, Lect. 2 hrs.; Discussion 1 hr.; Lab. 3 hrs.; T.P. Mommsen, M.L. Cameron; Instructor, M.J. O'Halloran. Same prerequisites as 3070. Biology 2000 not required in the Marine Biology programme. Credit may not be given for both 3070 and 3071.

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 in the laboratory and the techniques necessary to study them.

3073B Plant Physiology, Lect. 2 hrs., Lab. 3 hrs.; D.G. Patriquin. *Prerequisite:* Biology 2010 or 2015 or 2020 or permission of instructor.

Topics include water relations, photosynthesis, respiration, nitrogen metabolism, transport, translocation, and some aspects of plant development, crop physiology and productivity.

*** 3075A Plant-Soil Relationships,** Lect. 2 hrs., Lab. 3 hrs.; D.G. Patriquin.

This class deals with processes that are involved in the exchange of materials between plants and soils, and that limit plant growth under field conditions. The emphasis is on cultivated plants, but the material is relevant to natural systems, and reference is made to aquatic angiosperms and sediments. Topics include soil formation, soil aeration and root metabolism, water relationships, mineralization and humification of organic matter, plant mineral nutrition and ion uptake, fertilizers, saline soils and halophytic angiosperms, and plant-microbe interactions. Laboratory sessions deal with the design of field and greenhouse experiments and with the methodology of measuring the various properties and processes discussed in class.

3100B Aquatic Microbiology, Lect. 2 hrs.; lab. 3 hrs.; R.G. Brown, J. Novitsky.

Previous knowledge of microbiology is not necessary for this class; however, enrollment is limited to students in the Marine Biology Honours Programme. The main emphasis of this class is on the interactions of microbes and aquatic plants and animals including nutrition, disease, and immunization. The latter part of the class considers the role of microorganisms in nutrient availability and productivity in aquatic environments.

*** 3111B Microbial Activities in Nature,** Lect. 2 hrs.; Lab. 3 hrs.; R. Brown. *Prerequisites:* Biology 2100A/B and Chemistry 240 or Biology 2010/2015.

The format is lectures and laboratory exercises. Microorganisms play a far more important role in nature than their small size would suggest. To illustrate this, the following topics are considered at the cellular and molecular levels: epiphytic microorganisms of plants and animals. Koch's postulates, protective mechanisms of plants and animals, the function of microbes in ruminants and the rhizospere, nitrogen fixation and the mineralization of organic matter including petroleum.

3113A Bacterial Physiology, Lect. 2 hrs.; Lab. 3 hrs.; R. Brown. *Prerequisites:* Biology 2100A/B and Chemistry 240 or Biology 2010/2015.

Although the class concentrates on the structure and function of the bacterial cell envelope, that is, the capsule, cell wall and cell membrane, other topics such as the physiology of obligate anaerobiosis, sporulation, motility etc. are also covered.

3114A Introduction to Virology, (Microbiology Dept.).

3115A Introduction to Immunology, (Microbiology Dept.)

*** 3116 Mycology,** D. Brewer. *Prerequisite:* Biology 2100A or B.

An introduction to the morphology and taxonomy of the fungi.

Yeasts and Fungi, R. Brown. *Prerequisite:* Biology 2100A or B.

An introduction to the biology of yeasts and fungi with emphasis on the structure and function of the cell wall and membrane, control of cell metabolism, and the cell cycle.

3118B Systematic Bacteriology, (Microbiology Dept.).

3120B Advanced General Microbiology, Lect. 2 hrs.; Lab. 4 hrs.; J. Novitsky. *Prerequisite:* Grade B or better in Biology 2100A/B.

For students interested in increasing their knowledge and skills in microbiology beyond the introductory level. This class provides excellent background for students continuing in microbiology or entering employment where skills in handling microbes are required. Topics include microbial metabolism, growth, structure, genetics, taxonomy, symbioses, pathogenesis, the environmental effects on microbial activity, and an introduction to soil, food, aquatic, applied, and industrial microbiology. The laboratory stresses basic techniques in microbiology with a strong emphasis on individual students' skills.

3150A Applied Microbiology, Lect. 2 hrs.; Lab./Tutorials 3 hrs.; L.C. Vining. *Prerequisite:* Biology (Microbiology) 3120B.

For students who wish to broaden their interests in microbiology as well as for those with a particular interest in the applications of microbiology as a career. It deals with the role of microorganisms in processes such as cheese making, brewing and the production of vitamins, food additives, antibiotics and other economically important substances. It also includes topics such as sewage and waste treatment, conversion of biomass to fuels and the applications of biotechnology. The laboratory component consists of student projects with tutorial, seminar and group discussion of ideas and results.

3211B Systematic Survey of the Algae, Lect. 2 hrs.; Lab. 3 hrs.; A.R.O. Chapman. *Prerequisite:* Grade B or better in Biology 2000.

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.

3212A Biology of the Algae, Lect. 2 hrs.; Lab. 3 hrs.; A.R.O. Chapman. *Prerequisite:* Grade B or better in Biology 2000.

A non-systematic examination of the cellular, organismic, population and community organizations of benthic and planktonic algae.

3214A Plant Design, Lect. 2 hrs.; Lab. or Tutorials 1-3 hrs.; K.E. von Maltzahn.

The structural design of plants in terms of the functional performance of their parts and their integration at different levels of organization. Types of design are established on the basis of comparative studies of life forms seeking to find homologies between the elements of design. Design in relation to climate and habitat is examined and integrated at the level of the landscape.

3215A Systematics of Higher Plants, Lect. 2 hrs.; Lab. 3 hrs.; M.J. Harvey.

This class has two main aims; first, to give consideration to current speculation on the evolution of the flowering plants, connecting this with the attempts over the years to produce a phylogenetic classification of the existing species; second, to go into some of the newer concepts of classification arising out of the 'computer revolution'. A plant collection is one requirement; consult the instructor as early as possible about this.

3216B Adaptation and Speciation in Higher Plants, Lect. 2 hrs.; Lab./Seminar 2 hrs.; M.J. Harvey.

The discipline known as biosystematics or, alternatively, experimental taxonomy. The approach

taken is analytic, considering particular examples and trying to deduce which peculiarities of their biology have contributed to their relative success. In this way the mechanisms which have caused particular species pairs to diverge are studied. Examples considered are many and range from evening primroses and irises, through bananas and maize, down to the humble, but complex, dandelion.

3321 Invertebrates, Lect. 3 hrs.; Lab. 3 hrs.; J. Farley. *Prerequisite:* Biology 1000.

How different groups of invertebrate animals live - what modifications they have incorporated that allow them to survive in environments or to assume a manner of life unlike that of their evolutionary predecessors. Because there are so many kinds of invertebrate animals, certain morphological and functional changes are considered in those animals where they are most pronounced or where they first occur. The course progresses chronologically through the phylogenetic series; the characteristics of the animals in a group are considered and new physiological systems and morphological peculiarities are emphasized. A laboratory session each week gives students an opportunity to examine the morphology and life traits of live invertebrate animals.

***3322B Parasitology,** Lecture 2 hrs.; Lab. 3 hrs.; E. Angelopoulos.

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 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.

3323 Vertebrates, Lect. 2 hrs.; Tutorial 1 hr.; Lab. 3 hrs.; E.T. Garside. *Prerequisite:* Biology 2000.

A survey of the current state of knowledge and speculation concerning the evolution of vertebrate animals. Those vertebrates which have survived form a series of stages or steps, each characterized by several pronounced alterations in various organ-systems and in the general form of the body. Approximately three-quarters of the programme is given to an analysis, by procedures of comparison and contrast, of these changes and their relevance in the synthesis of the evolutionary pathway. An appreciation of the classification, structure and evolution of vertebrates is essential to considerations of their development and functional capacities and of their relations with their surroundings and with each other. The laboratory study of a broad array of vertebrates provides the core and familiarizes the student with the gross anatomic features of these animals while giving instruction in the traditional approach to comparison and contrast.

3324 Entomology, Lect. 2 hrs.; Lab. 3 hrs.; E. Angelopoulos.

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.

3400 The Rise of Science and the Modern World (same as History 3070, Physics 3400, Religion 3500). Lect./Sem. 2 hrs.; J. Farley, R. Ravindra.

The modern world has been fundamentally altered by science and technology. In what ways? How has this come to be? This class, *designed for students in the arts as well as the sciences*, examines these questions from the origins of modern science in the 16th and 17th centuries, to the professionalization of science in the 19th and to the scientific-industrial complex of the 20th. In addition, specific scientific theories (theory of evolution, germ theory, relativity theory etc.) are examined.

*** 3401A The History of the Biological Sciences,** J. Farley.

Designed for 3rd and 4th year students majoring in biology or geology. It deals mainly with selected topics in 19th and 20th century biology and geology. Students are urged to follow up this class with Philosophy 242B: Philosophy and the Life Sciences. The history of medicine is treated in a separate class: History 2995B.

3410B Man in Nature, Lect. 2 hrs.; Tutorials 1 hr.; K.E. von Maltzahn.

An introduction to the science of nature which deals with structural order within organic nature, i.e. the relationships of different beings to each other including man within nature as a whole. The ideal of man's self-realization through his emancipation from nature is discussed. The class is concerned with man's biological and aesthetic and rational requirements and how these different needs affect one another. It inquires into the consequences which these needs may have upon man's judgements and actions *and* the well-being of nature as a whole. For students in the arts and sciences. There are no special prerequisites, but students must deal seriously with questions raised. The class is also useful for students in biology who wish to obtain a broader framework of knowledge. General degree students may not include this class in the 4 required for a Biology major. Honours students may count it towards their Biology requirements.

***3421 Comparative Vertebrate Histology,** D.M. Chapman (Anatomy Dept.). *Prerequisites:* Biol. 2020 or 2015 and permission of the instructor.

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

3430A Introduction to Human Histology, Lect. 2 hrs., lab. 2 hrs.; D.H. Dixon (Anatomy Dept.) *Prerequisites:* Biol 2020A, or 2015 and permission of instructor.

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.

3440B Neuroanatomy, Lect. or lab. 3 hrs.; D.A. Hopkins (Anatomy Dept.) *Prerequisites:* Biology 2020 or 2015 or permission of instructor.

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.

3614 Field Ecology, Lect. 1 hr.; lab./field trip 4 hrs. (Some weekend field trips) R. Scheibling, B. Freedman; Instructor C. Beauchamp. *Prerequisite:* Biology 2046 or 2060, Math 106, Chem. 110.

The class emphasizes field methods in ecology giving a broad coverage of terrestrial and aquatic ecosystems. It is recommended that all students interested in ecology take this class during their third or fourth year. Topics include: a) Biotic sampling methods, b) Environmental measurements, c) Analysis of Production, and d) Analysis of populaton and communities.

Advanced Classes Offered

The following classes are primarily for honours and graduate students. They are open to others with permission of the instructor.

4024B Microscopy, Lect. 2 hrs.; Lab. 3 hrs.; J.H.M. Willison, D.B. Stoltz, K.B. Easterbrook. *Prerequisite:* A grade of B or better in 3023A.

A corollary to Biology 3023A. Instead of considering biological ultrastructure, the class deals with some of the principal methods involved in the study of cell structure. Both light and electron microscopy, including ancillary techniques, are considered in depth. The importance of a proper understanding of the physical and/or chemical principles governing technical procedures is emphasized. During laboratory periods students practise, or watch demonstrations of, some of the techniques covered in the lectures.

4025R The Mammalian Cell as a Microorganism, (Microbiology Dept.)

4030A Advanced Topics in Genetics, R.W. Lee and staff. *Prerequisite:* Permission of the instructor.

A general topic from the current literature in genetics is examined in seminar format. The nature of the topic and the instructor in charge of the class vary from year to year. Students present at least one seminar during the term.

*** 4037B Plasmid Genetics,** (Microbiology Dept.).

*** 4038B Control of Cell Division,** (Microbiology Dept.).

4039B Topics in Human and Medical Genetics; Lect./Seminar 2 hrs.; S. Blecher, O.P. Kamra (Coordinator), R.S. Tonks, J.P. Welch, E. Windsor, E. Zouros and others. *Prerequisites:* Biology 3039A or 1st year Medicine.

An advanced level seminar open to Biology and Medical students. Students present reports based on a research project (experimental or literature search) conducted under the supervision of faculty members in Biology or one of the medical departments. Lectures from the faculty supplement class work and emphasize integration of student seminars into a self-contained unit.

*** 4050B Seminar in Development,** Seminar 2 hrs.; B.K. Hall. *Prerequisites:* Biology 2050A or B, and Biology 3050B.

Current concepts and models of cellular differentiation, organogenesis, morphongenesis and embryonic development. Emphasis on vertebrates.

4060B Environmental Ecology, Lect. 2 hrs., Lab./Tutorial 3 hrs.; B. Freedman. *Prerequisites:* Biology 2046 or 2060.

Various topics within the field of Environmental Ecology are discussed. Emphasis is on the organism/ecosystem effects of forestry practices and other types of land management, including recreation. The effects of various types of pollutants, including acid precipitation, oil spills, heavy metals, sulphur dioxide, and chemical pesticides are considered.

*** 4064C Pleistocene Biogeography,** Lab. 3 hrs.; J.G. Ogden, III. *Prerequisites:* At least two credits in Biology or Geology. This class is to be taken in conjunction with Geology 457 Pleistocene Geology. Permission of the instructors. May be counted as Biology or Geology half-credit.

Lecture, discussion, and laboratory experience in the reconstruction of environmental change during the Pleistocene epoch. Laboratory and field experience pay particular attention to the environmental history of the Maritime region, including environmental changes caused by man. Techniques of pollen analysis, plant and animal macrofossil study, dendochronology, geochemical and isotopic dating methods are explored. Field and laboratory work include a class problem in an area in the Halifax region.

4067B Fisheries Population Biology, Seminar 2 hrs.; R.W. Doyle. *Prerequisites:* Biology 2060 or 2046; the course is intended for Honours and graduate students only. Familiarity with elementary calculus and statistics is required. Prior experience with computers is not required. Enrolment limited to 8.

An introduction to fisheries stock assessment and the biological aspects of fisheries management. Emphasis on the relationships between management techniques and the general principles of population biology. The class includes several weeks of introductory lectures followed by exercise in applied population dynamics lasting the remainder of the term. The exercise consists of a computer simulation of the growth and relation of a fish population of the student's choosing, coupled with computer-based investigations of the usefulness of various management models.

4068A Limnology, Lect. 3 hrs.; Tutorial 3 hrs.; P.A. Lane and staff. *Prerequisites:* 2046 or 2060.

This class is divided into four sections: a) Physical limnology; b) Chemical limnology; c) Biological limnology; and d) Cultural limnology.

4070C Advanced Topics in Animal Physiology, Lect. 2 hrs.; Open Lab.; R.K. O'Dor, M.L. Cameron, T.P. Mommsen; Instructor M.J. O'Halloran. *Prerequisites:* Biology 3070 or 3071.

Whereas the introductory animal physiology classes emphasize common principles, this class emphasizes the diversity of physiological solutions to common problems among animals. A different problem is chosen each year and each student presents a seminar reviewing the literature on the solution of a particular animal and applies advanced techniques in an experimental study of the animal. Students choose the animal and the technique.

*** 4072C Animal Nutrition,** J. Castell. Lect. and Seminar, 2 hrs.; *Prerequisites:* Biology 2010A/B or equivalent and permission of instructor. Biology 3013A and 3071 are recommended.

General principles and techniques of animal nutrition are reviewed and used to examine current literature. Emphasis is on the assessment of nutrition requirements of aquatic and marine species.

*** 4100A Marine Microbiology,** Lect. 2 hrs.; Seminar, Discussion and Laboratory, 2 hrs.; J.A. Novitsky. *Prerequisites:* Permission of the instructor.

The role of microorganisms in the marine environment. Some of the topics that are discussed include: the effect of the ocean environment on, and the determination of, microbial biomass and activity; the role of bacteria in nutrient regeneration and the fertility of seawater, geomicrobiology; and the interactions between microorganisms and higher forms. The format of lectures, seminars and laboratory demonstrations and projects directs the class material towards the students' interests and backgrounds. The class is intended for serious students of biology, oceanography or marine science; successful completion gives the student an understanding and working knowledge of the microbiology of the oceanic environment even if previous knowledge of microbiology is limited.

4101B Industrial Microbiology and Biochemistry, Lect. and Seminar 2 hrs.; L.C. Vining. *Prerequisites:* Third-year class in biochemistry or microbiology. A class in organic chemistry is recommended.

For students who have taken classes at the third-year level in microbiology or biochemistry and are interested in the practical applications of this knowledge. It deals through lectures with basic aspects of industrial fermentation processes and, through student seminars, explores topics in genetic engineering, antibiotic production and other current and projected uses of microorganisms in the manufacturing spere.

4114B Virology, (Microbiology Dept.)

4115B Immunology, (Microbiology Dept.) *Prerequisite:* Biology 3115A.

*** 4214B Physiology of Marine Algae,** Lect. 2 hrs.; J.S. Craigie. *Prerequisites:* Biology 2010 or 2015, 3010A.

A comparative study of the physiology and biochemistry of the various algae classes is conducted, including studies of carbohydrates, proteins, fats, pigments and nutrition.

4275B Topics in Seaweed Biology, A.R.O. Chapman. *Prerequisites:* Permission of the instructor.

In the academic year 84/85 the class examines the ecology of individuals, populations and communities of seaweeds through reading, seminars and a few lectures.

4369B Fisheries Oceanography, J.S. Kowslow (Oceanography Dept.)

4379A Ichthyology, Lect. 3 hrs.; E.T. Garside. *Prerequisite:* Biology 3323.

Evolution, systematics, structure, embryology, life history and distribution of fishes.

4401 Introduction to Pharmacology, Lect. 2 hrs.; Lab. 2½ hrs.; H.A. Robertson (Co-ordinator for Dept. of Pharmacology.) *Prerequisites:* Permission of co-ordinator.

This introductory class is designed to acquaint students with the actions of drugs on physiological and biochemical functions in mammals including man. Interactions of drugs with central and peripheral nervous systems and with the physiologically active chemicals (e.g. prostglandins, peptides) are stressed. Factors affecting blood levels of drugs (absorption, distribution, metabolism and elimination) are considered, and potential uses. The laboratory consists of prescribed exercises followed by a project of several weeks duration carried out in the research laboratories of the Dept.

4403 Human Physiology, Lect. 3 hrs., B. Issekutz (Physiology/Biophysics Dept.). *Prerequisites:* Introductory classes in Chemistry and Physics. Permission of the instructor is required.

A class dealing with the physio-chemical basis of the physiological processes in man.

*** 4459B Electrical and Mechanical Activity of Cardiac Muscle,** A.Y.K. Wong, T.F. McDonald (Physiology/Biophysics Dept.) *Prerequisites:* Permission of the instructor.

Mathematical characterization of the mechanics and energetics of muscle.

4616B Ecosystem Analysis, Lect./Discussion 3 hrs.; P.A. Lane. *Prerequisites:* Biology 2060 or 2046, 3061; Math 100 101.

This class involves critical discussions of recent developments in the theory and practice of ecosystem analysis. The research literature is the text. The term is divided into four sections: *quantitative techniques:* (1) general systems theory, (2) ecosystem description methodologies, (3) systems analysis-computer simulation; *and qualitative techniques:* (4) loop analysis and time averaging. Each student must lead at least one discussion and present a short position paper on the theory underlying some of the important problems in ecosystem analysis. In addition, a term paper is required demonstrating a creative application of these methodologies to an environmental problem at the ecosystem level. Students complete program sets and exercises in data analysis to gain experience using various techniques. Aquatic ecosystems are empphasized.

4617A Theoretical Population Dynamics, Lect. 2 hrs.; Tutorial 1 hr.; M.R. Rose. *Prerequisites:* Biology 2046 or 2060, Math 100, 101.

The class is divided into five sections: (A) Single species population growth — including discrete and continuous time models, (B) Prey-predator interactions — including continuous and discrete time models, (C) Competition — including Lotka-Volterra models, higher-order competition models and symbiosis models, (D) Simple ecosystems — including food chains, one predator and several prey; (E) Complex ecosystems.

4618B Theoretical Evolutionary Logic, M.R. Rose; *Prerequisites:* 2046 or 2060/2040, Math 100, 101; Lect. 2 hrs., tut. 1 hr.

The class is divided into three sections: (A) Asexual populations — selection with discrete and overlapping generations; (B) Sexual populations — selection with discrete and overlapping generations, selfing and fertility selection, migration, two-locus models; (C) K-and-r-selection —density-dependent selection, life-history evolution.

4650/5650A Resource Ecology and Economic Development, Lect./Seminar 3 hrs.; A.J. Hanson.

Major theories of natural resource management have evolved rather separately through economic, behavioural and ecological disciplines. The interphase of ecology with these other disciplines and the criteria which may be used to weigh ecological inputs in economic development planning processes are the major topics to be covered. Current approaches and analytical techniques are described. These illustrate adaptive strategies for long-term resource use, pest and disease control. The course may focus on specialized topics such as fisheries or tropical resource management, as announced in advance. The class includes an introduction to practical problems of project cycles, of defining objectives and of budget analysis. It is open to students from any faculty by permission of the instructor.

4652A Advanced Ecology Seminar, Consult Department.

4653B Advanced Ecology Seminar, Consult Department.

4660B Introduction to Biological Oceanography, Lect. 3 hrs.; staff.

A survey of marine populations and their relationships with their physical environment and with each other. Permission of the instructor is required.

*** 4662B Biology of Phytoplankton,** R.O. Fournier. (Oceanography Dept.) Permission of instructor required.

This class considers current topics in the field of biology of marine zooplankton. Aspects of the life of these organisms — such as feeding, locomotory behavious, small-scale distribution and zoogeographic patterns — are studied in an attempt to understand how these small animals fit in their environment.

4664B History of Oceanography, Lect. and Seminar; E.L. Mills (Oceanography Dept.) Permission of instructor required.

This class describes the development of Oceanography from biological, chemical, physical and geological knowledge going back to the 18th century in scientific political and social contexts. Includes: plankton dynamics, deep sea biology, ocean circulation and plate tectonics.

*** Benthic Ecology,** Permission of instructor required (Oceanography Dept.)

An advanced level undergraduate 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 processes in the sediments. Year-to-year the course content changes, keeping up with current problems of research workers in this discipline.

4800 Special Topics

4806/4807B/4808C Special Projects, staff.

4900 Honours Research and Thesis.

Canadian Studies Programmes

Who are eligible

Dalhousie students who are planning to do, or are at present doing, major programmes in any of the following six departments, are eligible.

The six departments are: Economics, English, French, History, Political Science and Sociology & Social Anthropology.

Aim

The purpose of the programme is to allow such 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 Political Science would take at least 3 of his political science classes in classes designated as Canadian. He would in addition take four classes outside his major field in Canadian Economics, Canadian History, Canadian Literature (either English or French), or Canadian Sociology.

In other words, the Canadian Studies Programme does not attempt to establish a new major field. It seeks to use any one of six present departments in the Faculty of Arts and Science as a base around which a student may effectively cluster a number of classes in Canadian subjects.

How to arrange it

Students wishing to discuss a Canadian Studies Programme, or wishing to take it, should get in touch with any of the following:

Professor B. Lesser, Economics Department
Professor M.G. Parks, English Department
Professor Hans Runte, French Department
Professor P.G. Clark, Sociology & Social Anthropology Department
Professor D.S. Stairs, Political Science Department
Professor P.B. Waite, History Department

Chemistry

Chairperson of Department
W.A. Aue

Professors
D.R. Arnold, B.S. (Bethany College), Ph.D. (Roch.) - *Killiam Research Professor*
W.A. Aue, Ph.D. (Vienna)
T.S. Cameron, B.A., M.A., D.Phil. (Oxon.)
W.J. Chute, B.Sc. (Acad.), M.A., Ph.D. (Tor.)
J.A. Coxon, M.A. (Cantab.), M.Sc., Ph.D. (East Anglia)
T.P. Forrest, B.Sc. (Mt.A.), M.Sc. (Dal.), Ph.D. (U.N.B.)
K.E. Hayes, B.Sc. (Lond.), Ph.D. (Ore.)
W.E. Jones, B.Sc., M.Sc. (Mt.A.), Ph.D. (McG.) - *Chairman of Senate*
O. Knop, D.Sc. (Laval) — *Harry Shirreff Professor of Chemical Research*
K.T. Leffek, B.Sc., Ph.D. (Lond.) - *Dean of Faculty of Graduate Studies*
D.E. Ryan, B.Sc. (U.N.B.), M.A. (Tor.), Ph.D., D.Sc. (Lond.), D.I.C. — *McLeod Professor of Chemistry; Director, Trace Analysis Research Centre and Slowpoke Reactor*

Associate Professors
R.J. Boyd, B.Sc. (U.B.C.), Ph.D. (McG.)
A. Chatt, B.Sc. (Calcutta), M.Sc. (Roorkee), M.Sc. (Wat.), Ph.D. (Tor.)
G.A. Dauphinee, B.Sc., M.Sc. (Dal.)
T.B. Grindley, B.Sc., M.Sc., Ph.D. (Qu.)
J.S. Grossert, B.Sc., M.Sc., Ph.D. (Natal)
D.L. Hooper, B.Sc., M.Sc., Ph.D. (U.N.B.)
J.C.T. Kwak, B.Sc., M.Sc., Ph.D. (Amsterdam)
P.D. Pacey, B.Sc. (McG.), Ph.D. (Tor.)
J.A. Pincock, B.Sc., M.Sc. (Manit.), Ph.D. (Tor.)
L. Ramaley, B.A. (Col.), M.A., Ph.D. (Prin.)
R. Stephens, M.A. (Cantab.), M.Sc. (Bristol), Ph.D. (Lond.), D.I.C.
C.H. Warren, B.Sc. (U.W.O.), Ph.D. (McM.)
R.E. Wasylishen, B.Sc. (Wat.), M.Sc., Ph.D. (Manit.)

Assistant Professors
K.R. Grundy, B.Sc., M.Sc., Ph.D. (Auckland)
R.D. Guy, B.Sc. (S.F.U.), Ph.D. (Carl.)

NSERC Research Fellows
B.J. Forrest, B.Sc. (U.W.O.), M.Sc. (Bishop's), Ph.D. (S.F.U.)
M.A. White, B.Sc. (U.W.O.), Ph.D. (McM.)
R.L. White, B.Sc. (Dal.), Ph.D. (McM.)

Research Assistant
S.W. Kim, Ph.D. (Wayne State)

Instructors
C.D. Burkholder, B.Sc. (Wat.)
J. Gabor, M.Sc. (Budapest)
K. Gorezelska, Ph.D. (Wind.)
S.A. Sawler, B.Sc., (M.S.V.U.)
D.J. Silvert, M.S. (C.W.R.U.)
W.D. Tacreiter, M.Sc. (Krakow)
K.E. Thompson, B.Sc. (Acad.)

Postdoctoral Fellows and Research Associates
D. Adhikesvalu, Ph.D. (IIT, Bangalore)
A.D. Becke, Ph.D. (McM.)
H. Bem, Ph.D. (Lodz)
M.K. Biswas, Ph.D. (Kalyani)
M. Daniewski, Ph.D. (Warsaw)
K.N. De Silva, Ph.D. (Dal.)
P.K. Dubey, Ph.D. (Osmania)
O. Fadaly, Ph.D. (Osmania)
X. Feng, (Chinese Acad. of Sciences)
H. Furue, Ph.D. (Qu.)
M. Gimpel, Ph.D. (Mainz)
J.W. Goodin, Ph.D. (Leicester)
T-Z. Guo, (Qinghai Geology Bur.)
K. Haapakka, Ph.D. (Turku)
K. Hayakawa, Ph.D. (Osaka)
M. Hojatti, Ph.D. (Essex)
M.H. Kaistila, (U. of Helsinki)
S.M. Kaushik, Ph.D. (IIT, Delhi)
A. Kumari, Ph.D. (IIT, Delhi)
S. Kusuma, Ph.D. (Osmania)
A. Malovikova, Ph.D. (Bratislava)
J. Mattai, Ph.D. (Dal.)
S. Muddukrishna, Ph.D. (IIT, Madras)
R.S.S. Murthy, Ph.D. (IIT, Madras)
H. Nakamura, Ph.D. (Kyushu)
V. Paramasigamani, Ph.D. (Dal.)
U.V. Pandya, Ph.D. (Bangalore)
S. Peiris, Ph.D. (Concordia)
M. Sajjad, Ph.D. (Wat.)
R. Subramanian, Ph.D. (Madras)
U.K. Roychowdhury, Ph.D. (IIT, Kanpur)
J.M. Ugalde, Ph.D. (Valladolid)
B. Yamashita, Ph.D. (U.W.O.)

As one of the basic sciences, chemistry can help provide us with an understanding of the processes occurring in the materials surrounding us. A student considering an honours programme in chemistry should be competent in mathematics as well as chemistry. The honours B.Sc. is the minimum professional requirement for a chemist - the general B.Sc. with a major in chemistry has no professional standing. Chemists with honours degrees are employed in widely differing areas in industry and government. An honours degree in chemistry will provide a background for further graduate work in chemistry or in such areas as medicine, law, business administration, biochemistry, oceanography and geology. A postgraduate degree is essential for independent original research or university teaching.

Chemistry 110 or 120 is an introduction to the discipline. Many students must take introductory chemistry and possibly second and third-year classes in the subject as well. Engineering students contemplating chemical engineering should consult the Department of Engineering for advice on desirable classes in chemistry. All students

intending to take classes in chemistry beyond the first-year level should include classes in mathematics and physics in their first year, and final grades in these classes should not be less than C; if they are, the student is bound to find advanced classes in chemistry difficult and frustrating.

At the second-year level the student is exposed to the four traditional areas of chemistry specialization. Inorganic chemistry deals with all the chemical elements except carbon, and the compounds which these elements form. Organic chemistry is devoted to the study of the almost limitless number of compounds containing carbon. Analytical chemistry is concerned with the determination of the composition of substances, and with the detection of elements in quantities however minute. Physical chemistry is concerned with both bulk phenomena (including why and at what rates chemical reactions occur) and with molecular phenomena (through the application of spectroscopic techniques). Beyond the second-year level, a student's studies in chemistry become increasingly concentrated in one of these four areas. The student may also be introduced to biochemistry or the chemistry of living organisms, as well as such specialties as structural chemistry, radiochemistry, electrochemistry and theoretical chemistry.

Degree Programmes

Major in Chemistry
In order to obtain as general a chemical background as possible, the student after taking Chemistry 110, or 111, or 112, or 120, should include in his program the classes 211A/B, 220A/B, 230A, 234B and 240, which give exposure to the four areas of specialization in chemistry. The remaining requirements in chemistry may be chosen from third and fourth-year classes depending on the student's major interests. Each student who plans to major in chemistry should consult with a Chemistry Counsellor each year regarding a programme of study. The student's programme should also include Mathematics 100 and 101 and Physics 110.

The Chemistry Counsellors this year are A. Chatt, W.J. Chute, B.J. Forrest, K.R. Grundy and J.A. Pincock. All students are encouraged to meet with one of these faculty members to discuss any problems that may arise.

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. All honours students must consult annually with an Honours Student Advisor (W.J. Chute or J.A. Pincock), and obtain his approval of their course selection.
All required chemistry classes must be passed with a grade of at least C.

Year I will normally consist of:
Chemistry 110 or preferably Chemistry 120; Mathematics 100 and 101; a foreign language at the 100 level; one of Biology 1000, Geology 100 or Physics 1100; plus an elective.

Years II, III and IV must include:
1. Chemistry 211A/B, 220A/B, 230A, 234B, and 240
2. Six full classes from Chemistry 300 and 400 levels. Chemistry 300A, 311A, 312B, 321A, 322B, 330A, 331B, 341A, and 342B are required classes. In addition the non-credit classes 388, 488 and 8880 must be taken.
3. Mathematics 200 or 220; a prerequisite for Chemistry 300A and 330A.
4. Five other classes. These must be chosen as follows:
a) If Physics 1100 was not taken in Year I, it must be taken in Years II-IV.
b) Two classes beyond the 100-level must be taken in a minor subject. Minor subjects allowed for this degree are biochemistry, biology, computing science, geology, mathematics or physics.

These five other classes should be chosen according to the future plans of the student.

Combined Honours Program
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, Geology, Mathematics or Physics. To obtain an introduction into all the basic areas of chemistry, Chemistry 211A/B, 220A/B, 230A, 234B and 240 must be part of all combined honours programmes involving Chemistry, and must be passed with a grade of at least C.

In addition to the above second-year chemistry classes, the following programmes are suggested for guidance to the student.

Combined with Biochemistry
Chemistry 341A, 342B, 333A/B, 343A/B, 440A/B, 441A/B, 442A/B and 8880, together with Biochemistry 2000R, 2600A/B, 3200A, 3300B, 3400B and 1-1/2 other full credits in Biochemistry and Chemistry of which one must be in Biochemistry.

Combined with Biology
Chemistry 213A, 341A, 342B, 343A/B, 440A/B, 441A/B, 442A/B and 8880 with Biology 2000, 2010A/B, 2020A/B and 2-1/2 other full credits in Biology and Chemistry of which at least two must be in Biology.

Combined with Computing Science
Chemistry 300A, 400A/B, 430A/B, 435A/B and 8880 with Computing Science 227B, 245A, 261A/B, 369A, 370A/B and 3-1/2 other credits in Chemistry and Computing Science of which at least 1-1/2 must be in Computing Science. Students are reminded that Math 100A/B, 101A/B, 203A, Computing Science 140A/B and 141A/B are prerequisites to the Computing Science classes.

Combined with Geology
Chemistry 311A, 312B, 321A, 322B, 411A, 412B and 8880 with Geology 210, 220 and 3 other full credits in Chemistry and Geology of which at least two must be in Geology.

Combined with Mathematics
Chemistry 300A, 330A, 400B, 430A/B and 8880 with Mathematics 213, 250, 311A, 312B, 350 and at least one credit from 406, 410B, and one other full chemistry or mathematics credit.

Combined with Physics
Chemistry 300A, 330A, 331B, 334B, 400B and 8880 with Physics 2110, 2120, 2200A, 2210B, 3140A, 3150B, 3210A/B, 3200A/B and 1 other chemistry or physics credit.

The above are only guidelines and students must consult an Honours Student Advisor of the Department of Chemistry and the Chairman of the other area of study *before* registering in the combined programme.

Co-operative Education Programme in Chemistry
DALCHEM CO-OP
The **"Dalchem Co-op"** cooperative programme in chemistry provides chemistry students with an integrated pattern of academic study and supervised work terms in industry, government laboratories and institutes, etc. The programme enables students to obtain a better appreciation of the practical problems they will face in their chemical careers upon leaving the University. The work term experience gives students a practical application of their newly acquired knowledge, and adds to their motivation for academic study.

Eligibility
Students entering their second year of an honours programme in chemistry or combined honours programme at Dalhousie are eligible for admission. Application forms can be obtained from the Department office.

The Work-Study Programme
The programme consists of 8 academic terms and 4 supervised work terms. A term is defined as a 4 month period, i.e. the summer term (S) from May through August, the fall term (F) from September through December, and the winter term (W) from January through April. Students normally follow one of two sequences:

Year	1			2			3			4			5
	F	W	F	W	S	F	W	S	F	W	S	F
A	1	2	3	4	W1	5	6	W2	W3	7	W4	8
B	1	2	3	4	W1	5	W2	W3	6	7	W4	8

Where the numbers 1-8 stand for fall or winter academic terms, and W1-W4 for work terms.

Classes and Degrees
The 8 academic terms allow for the accumulation of 20 class credits and the Honours Requirement, Chemistry 8880, satisfying the requirements for:
a) A B.Sc. degree with Honours in Chemistry
b) A B.Sc. degree with Honours in Chemistry and Another Approved Subject Combined.
The academic programme and required classes are the same as for the B.Sc. degree with Honours in Chemistry or the B.Sc. degree with Honours in Chemistry and Another Approved Subject combined, as described earlier, including Chem 388 and Chem 488. For detailed programmes consult the Programme Director. In addition, in year 2 Co-op students are required to participate in the non-credit course and lecture series "Chemical Practice".

The Work Term
The Programme Director contacts employers in Nova Scotia, other Maritime Provinces or other parts of Canada. Co-operating employers will interview students available for placement approximately 2 months before the start of the work term. The employer pays the student at rates determined by the employer's wage structure. The Department works hard to ensure placements for all students, but it may happen that due to circumstances beyond the Department's control a given student will not find employment in a given term. Such cases should be rare, but students who find themselves in this position must still complete four work term placements before graduating. Each student will have a faculty adviser during the work term. The student is required to write a work term report for each work term, to be submitted to and graded (on a Pass/Fail basis) by the employer. Students who for some reason do not complete four work terms satisfactorily but who have completed all academic requirements can still graduate with an Honours Degree in Chemistry, but they will not have completed the Co-operative Education Programme.

For each work term, the student is required to register as follows: Chemistry 8891, Work Term 1; Chemistry 8892, Work Term 2; Chemistry 8893, Work Term 3; Chemistry 8894, Work Term 4.

Further Information
The Co-op Programme is currently under review and may be subject to change. For further information contact the Programme Director, Co-operative Education Programme in Chemistry, Department of Chemistry, Dalhousie University, Halifax, N.S., B3H 4J3.

Classes Offered

A or B indicates that the class is a half credit and is offered in either the A or B term or in exceptional circumstances in both terms. The names of professors are those teaching the classes in 1983/84 and not necessarily those for 1984/85. Consult the timetable for up to date details.

Early registration is advantageous for students and strongly encouraged by the Chemistry Department. Certain classes, notably Chem 110 and 240, may fill up long before the final registration period.

First Year and Senior Resource Centres are located in Rooms 167 and 166. The centres are staffed with people who can help with Chemistry problems and the facilities include study areas, computer terminals with special programmes designed for Chemistry students, molecular models, audio-visual aids and a small library.

105 Chemistry For Dental Hygiene Students, Lect. 3 hrs.; Lab. 3 hrs.; G.A. Dauphinee.

A credit class for students enrolled in Dental Hygiene *only*, Chemistry 105 is not a prerequisite to second-year chemistry classes. The subjects discussed in the first term include atomic structure, solution equilibria and simple inorganic chemistry; organic chemistry is discussed in the second half of the year. Laboratory experiments are integrated with the material discussed in lectures.

110 General Chemistry, Lect. 3 hrs.; Lab./Tutorial 3 hrs.; W.A. Aue, A. Chatt, W.J. Chute, J.A. Coxon, G.A. Dauphinee, W.E. Jones, D.E. Ryan, C.H. Warren, R.L. White.

A study of the fundamental principles of chemistry with particular reference to stoichiometry, atomic and molecular structure, gases, liquids and solids, solutions, thermochemistry, equilibria, chemical properties of common substances, acid-base and oxidation-reduction reactions and chemical kinetics. Students enrolling in this class should have a background in chemistry at least equivalent to the Nova Scotia XI level. Those who do not should consult the Department. It is important that students be familiar with exponents and logarithms, proportionality and variation, graphical methods and be able to solve quadratic and simultaneous equations.

111 General Chemistry for Engineering Students, Lect. 3 hrs.; Lab./Tut. 3 hrs; K.E. Hayes.

Similar to Chemistry 110, but with a greater emphasis on the mathematical approach to chemistry. Basic chemical thermodynamics is presented in an exact algebraic manner, and includes a study of isothermal and adiabatic transformations for ideal gas systems as well as isothermal equilibria between liquids and vapors. All of the other topics, such as gas phase equilibria, the Gibbs-Helmholtz equation, electrochemistry and reaction kinetics are treated mathematically. Wherever possible examples and problems are selected from the real world. This class is open only to students enrolled in the Engineering program.

112 General Chemistry for Pharmacy Students, Lect. 3 hrs.; Lab./Tut. 3 hrs; D.L. Hooper.

The content of this class is essentially the same as that of Chemistry 110 except that emphasis is on certain areas of importance in Pharmacy.

120 Principles of Chemistry, Lect. 3 hrs.; Lab./Tut. 3 hrs; R. Stephens.

Similar to Chemistry 110 but with more emphasis on atomic and molecular structure, thermodynamics, equilibria and kinetics. This class is intended for prospective science students and for students wishing to gain a more thorough introduction to the principles of chemistry. Students enrolling in this class must have attained high standing in high school chemistry. Concurrent enrollment in Mathematics 100 and 101 is advised.

Any of Chem. 110, 111, 112 or 120 may serve as a prerequisite for any 200 level class in chemistry, and as a credit in the Faculty of Arts and Science. However, credit will only be given for **one** *of 110, 111, 112 or 120.*

143 Introductory Chemistry and Biochemistry, Lect. 3 hrs.; Lab./Tut. 3 hrs.; J.A. Pincock and F.I. Maclean.

Designed for Nursing students; for more details see School of Nursing's entry in this calendar. Material in the first term is given by the Department of Chemistry and includes the fundamentals of general and organic chemistry. In the second term medically relevant biochemistry is discussed by the Department of Biochemistry.

211A or B Introductory Inorganic Chemistry, Lect. 3 hrs.; Lab. 3 hrs.; T.S. Cameron, K.R. Grundy. *Prerequisite:* Chemistry 110 (111, 112, 120).

The fundamentals of Inorganic Chemistry are covered. Specific topics include: ionic bonding and the nature of solids, the structure of atoms and simple molecular orbital theory, coordination chemistry of the transition metals and a certain amount of systematic chemistry of inorganic compounds. The preparation, analysis and observation of inorganic compounds are the laboratory assignments.

213A or B Inorganic Chemistry of Life, Lect. 2 hrs.; Lab. 3 hrs.; T.S. Cameron. *Prerequisite:* A good understanding of the principles studies in Chemistry 110. This class may **not** be included in nine chemistry credits required for an honours chemistry degree, see Academic Programmes 5.3.6.1(a)(i); it may however be taken by honours chemistry students in addition to these nine.

Inorganic elements and their compounds in living systems, their special properties, structures and reactivities are studied. The laboratory illustrates class work with experiments on compounds isolated from living systems and on inorganic compounds that are used as models for these systems.

220A or B Introductory Analytical Chemistry, Lect. 3 hrs.; Lab. 3 hrs.; L. Ramaley. *Prerequisite:* Chemistry 110 (111, 112, 120).

A thorough introduction to non-trace analytical techniques and to those instrumental techniques most often encountered in the laboratory. Topics include theory of titrations; gravimetric analysis; acid-base, precipitation and redox equilibria; spectrophotometry; potentiometry with ion selective electrodes; and chromatography. Examples of topics covered in the lecture are used in the laboratory, which involves both qualitative and quantitative chemical analysis.

230A An Introduction to Physical Chemistry, Lect. 3 hrs.; Lab. 3 hrs.; K.E. Hayes, P.D. Pacey. *Prerequisites:* Chemistry 110 (111, 112, 120). Mathematics 100, 101.

A basic introduction to the physical chemistry of gases, liquids, solids and solutions with the stress on the thermodynamics and kinetics at a macroscopic level. The laboratory sessions illustrate many aspects of the class work with modern techniques and apparatus.

233A or B Physical Chemistry for the Life Sciences, Lect. 3 hrs.; Lab./Tut. 2 hrs.; B.J. Forrest *Prerequisite:* Chemistry 110 (111, 112, 120).Chemistry majors may not apply credit for Chemistry 233B towards the major requirements of a degree in Chemistry, although they may take Chemistry 233B as an elective. Credit will **not** be given for both Chemistry 230A and Chemistry 233B. Credit will be given for both Chemistry 234B and Chemistry 233B unless the student is in major or honours Chemistry.

Those who do not plan a career in chemistry, but who can use the principles and concepts of physical chemistry in related areas, are introduced to the basic ideas of physical chemistry with the necessary mathematical concepts in simple terms. Previous knowledge of calculus is not necessary. The principal topics, chemical equilibrium, rate of chemical reactions, electrochemistry and properties of solutions are treated by application to examples of biological and environmental interest.

234B Spectroscopy: Principles and Applications, Lect. 3 hrs.; Lab. 3 hrs; J.A. Coxon, R.E. Wasylishen. *Prerequisites:* Chemistry 110 (111 , 112, 120), Mathematics 100, 101 (unless taken concurrently) or permission of the instructor.

Scientists obtain a great deal of useful information from a study of the interaction between matter and electromagnetic radiation. The various regions of the electromagnetic spectrum are discussed, with sufficient fundamental theory to enable the student to understand and interpret the type of information that may be obtained.

240 Introductory Organic Chemistry, Lect. 3 hrs.; Lab. 3 hrs.; T.P. Forrest, T.B. Grindley, J.S. Grossert, J.A. Pincock. *Prerequisite:* A good comprehension of the principles studied in Chemistry 110.

A broad introduction to the chemistry of carbon compounds, including molecular shapes and bonding, characteristic reactions of functional groups and the way in which they take place, and the application of spectroscopy to organic chemistry. Laboratory work is designed to teach a broad range of fundamental operations and techniques used in modern organic chemistry laboratories.

300A Introductory Theoretical Chemistry, Lect. 3 hrs.; C.H. Warren. *Prerequisites:* Mathematics 200 or 220 and Chemistry 211A/B or 230A or 234B.

An introduction to quantum mechanics and its application to spectroscopy and the electronic structure of atoms. 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.

311A Chemistry of the Main Group Elements, Lect. 2 hrs.; Lab. 3 hrs.; T.S. Cameron. *Prerequisite:* Chemistry 211A/B.

A systematic study of the chemistry of the main group elements, with particular emphasis on the nonmetals of the first and second row elements. Use is made of modern bonding concepts. The laboratory introduces synthetic procedures for the preparation of inorganic compounds including study of their reactions. Some of these experiments involve special handling techniques, such as controlled atmosphere, high temperature or vacuum line manipulation.

312B Chemistry of the Transition Metals, Lect. 2 hrs.; Lab. 3 hrs.; O. Knop. *Prerequisites:* Chemistry 211A/B, Mathematics 100 and 101.

The transition elements and their complexes, using modern bonding theories (crystal and ligand field), are covered, unifying the chemical and physical properties of these substances. The laboratory experiments introduce procedures for the preparation and characterization of compounds of the transition elements.

321A Solution Equilibria and Analytical Spectroscopy, Lect. 3 hrs.; Lab. 3 hrs.; A. Chatt. *Prerequisite:* Chemistry 220A/B.

Chemistry 321A is organized into three units. 1. Introduction to Statistics; 2. Chemical equilibria

and their analytical applications; and 3. Spectrochemical methods of analysis. Laboratory experiments illustrate the above techniques with practical examples.

322B Analytical Electrochemistry and Separations, Lect. 3 hrs.; Lab. 3 hrs.; L. Ramaley. *Prerequisites:* Chemistry 220A/B and 321A or permission of the instructor.

Chemistry 322B deals with the application of electrochemical and separation techniques to chemical analysis. The basic chemical and physical principles are explained, applications to analytical problems are examined and instrumentation is described. The laboratory work is concerned with practical examples of the above techniques in both qualitative and quantitative analysis.

330A Chemical Thermodynamics, Lect. 2 hrs.; Lab. 3 hrs.; M.A. White. *Prerequisites:* Chemistry 230A or equivalent and Mathematics 200 or 220. A good working knowledge of calculus is required.

The laws of thermodynamics are applied to systems which can undergo chemical as well as physical changes. The first part of the class introduces the thermodynamic quantities, and the calculation of these properties for a large variety of systems and physical and chemical changes. Special emphasis will be placed on the chemical potential and other partial molar properties. Non-ideal systems, solutions, and chemically reacting systems will be treated. In the laboratory 6 experiments are performed. There is one laboratory period per week. A formal report is submitted for each of the experiments.

331B Chemical Kinetics, Lect. 2 hrs.; Lab. as needed; P.D. Pacey. *Prerequisite:* Chemistry 230A or equivalent.

Chemical kinetics includes the treatment of experimental rate data obtained from simple and complex reactions, the steady state approximation and its application, the Rice-Herzfeld approach to complex reactions, photolysis, luminescence and special techniques for studying fast reactions. Examples are drawn from reactions in the gas phase and in liquid solutions. An understanding of the mechanisms of chemical reactions is sought by using the methods of Absolute Reaction Rate Theory. The laboratory is open at all times. Each student completes at least five experiments.

333A or B Biophysical Chemistry, Lect. 2 hrs.; Lab. 3 hrs.; R.E. Wasylishen. *Prerequisites:* Chemistry 230A, 233B, or 234B.

This class can be taken in the 3rd or 4th year of study, and provides a theoretical and practical introduction necessary for the application of physical chemistry in life sciences and medicine. Topics include equilibrium and transport properties of solutions containing macromolecules and electrolytes, membrane equilibria, biochemical spectroscopy and macromolecular structure. The laboratory is on an open basis with at least four experiments completed during the term.

*** 334B Spectroscopy and Photochemistry,** Lect. 2 hrs.; Lab. 3 hrs.; W.E. Jones. *Prerequisites:* Chemistry 234B, 300A.

The theorectical and practical aspects of atomic and molecular theory are applied to spectroscopic and photochemical problems.

341A or B Identification of Organic Compounds, Lect. 3 hrs.; Lab. 3 hrs.; T.B. Grindley, *Prerequisites:* Chemistry 240 (or equivalent).

The techniques necessary for the identification of organic compounds are introduced. Some presentation of the classical analysis methods is given, but the main emphasis is on modern spectroscopic techniques. The class builds on the framework of the functional group classification developed in introductory organic chemistry classes. Students work independently in the laboratory to identify unknown substances and to separate and identify components of mixtures using a variety of techniques.

342A or B Synthesis in Organic Chemistry, Lect. 3 hrs.; Lab. 3 hrs.; J.S. Grossert. *Prerequisites:* Chemistry 240 (or equivalent).

The reactions of a variety of functional groups and their applications to multi-step organic syntheses are surveyed. Examples chosen include syntheses of compounds which are important to the chemical and pharmaceutical industries. Students work independently in the laboratory and carry out a variety of syntheses. Experiments are designed so that students learn to monitor the purity of their products by the use of spectroscopic and other techniques. Some library work is required.

343A or B Bioorganic Chemistry, Lect. 3 hrs.; T.P. Forrest. *Prerequisites:* Chemistry 240 (or equivalent). This class may *not* be included in the nine chemistry credits required for an honours chemistry degree (Academic Programmes 5.3.6.1(a)(i)). It may however be taken by honours chemistry students in addition to these nine.

Since molecules in nature operate under the same rules as those in an organic laboratory, one can apply the principles elucidated in the organic laboratory to the study of the behavior 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 a particular reactivity. An analysis of the requirements for reactivity, methods by which these can be achieved and the influence of various factors on the outcome of reactions serve as the basis for the consideration of selected naturally occuring reaction pathways.

388 General Topics in Chemistry. A non-credit seminar class to be given by invited speakers which must be taken by all 3rd year honours Chemistry students.

*** 400B Theoretical Chemistry,** Lect. 2 hrs.; *Prerequisites:* Chemistry 300A.

A continuation of 300A. Molecular orbital theory and its applications are examined in greater detail. Group theory is introduced and applied to spectroscopy and molecular orbital theory.

410A or B Inorganic and Organometallic Reaction Mechanisms in Synthesis, Lect. 2 hrs.; Lab 3 hrs.; K.R. Grundy. *Prerequisites:* Chemistry 311 and 312 or permission of the instructor.

This class examines the fundamental aspects of inorganic reaction mechanisms such as substitution, isomerisation, oxidative addition, insertion, etc., together with their applications to inorganic synthesis. The laboratory is project oriented with each project illustrating the various mechanistic paths discussed in class. The experiments incorporate modern inorganic synthetic techniques and characterization by instrumental methods where appropriate.

412B Solid State Chemistry, Lect. 2 hrs.; Lab. 3 hrs.; O. Knop. *Prerequisites:* Chemistry 211A/B, 330A, and 435A (or equivalents) or consent of instructor.

All chemical elements and compounds can exist as crystalline solids, and most of them normally do. The arrangements of atoms and molecules in such solids, known as crystal structures, closely reflect the bonding properties and constituent elements. They can be studied by methods that do not destroy or modify the crystal structure. The methods most frequently employed for this purpose together with the principles of solid state chemistry in general are covered.

420A or B Analytical Instrumentation, Lect. 2 hrs.; Lab. 3 hrs.; R. Stephens. *Prerequisites:* Chemistry 321A and 322B or permission of instructor.

Spectroscopic methods of elemental analysis. The theory and use of analytical instruments. Specific topics discussed change from year to year according to the interests of the professor and students.

421A or B Instrumental Analyasis, Lect. 2 hrs.; Lab. 3 hrs.; R. Stephens. *Prerequisites:* Chemistry 321A and 322B or permission of instructor.

Various instrumental techniques are covered, with emphasis on separation methods for organic samples. Specific topics discussed change yearly according to the interests of professor and students.

*** 430A or B Introductory Statistical Thermodynamics,** Lect. 3 hrs.; C.H. Warren. *Prerequisites:* Chemistry 330A or permission of the instructor.

An introduction to the principles of statistical thermodynamics and quantum statistical mechanics. Wherever possible the application of statistical thermodynamics to chemical systems as well as physical and biological processes is emphasized.

435A Symmetry and Group Theory, Lect. 2 hrs.; compulsory tutorial 3 hrs.; O. Knop. *Prerequisites:* Chemistry 211A/B and Mathematics 200 or 220, or consent of instructor.

The theory of abstract groups and their representations, crystallographic and non-crystallographic point groups, and an introduction to the theory of space groups are presented. Examples from stereo-chemistry, crystallography, and spectroscopy illustrate the theory. Knowledge of elementary manipulations of matrices and determinants is desirable.

440A or B Organic NMR Spectroscopy, Lect. 2 hrs.; Lab. 3 hrs.; D.L. Hooper and T.P. Forrest. *Prerequisites:* Chemistry 341A, or equivalent, or permission of instructor.

Nuclear Magnetic Resonance experiments and their interpretation. Application of NMR and other spectroscopic methods in the structure determination of organic molecules.

441A or B Stereochemistry and Synthesis in Organic Chemistry, Lect. 2 hrs.; Lab. 3 hrs.; T.P. Forrest and J.S. Grossert. *Prerequisites:* Chemistry 341A, 342B or equivalent, or permission of instructor.

Organic stereochemistry including conformation and synthesis, illustrated with examples from natural products, are discussed. Laboratory experiments incorporate modern, advanced synthetic techniques and principles.

442A or B Organic Reaction Methanisms, Lect. 2 hrs.; Lab. 3 hrs.; D.R. Arnold and K.T. Leffek. *Prerequisites:* Chemistry 341A, 342B and Chemistry 230A or equivalents, or permission of the instructors.

Methods for determining the mechanisms of organic reactions are discussed from the viewpoint of the physical organic chemist. Topics considered include applications of kinetic data, isotope and salt effects, linear free energy relationships and acid and base catalysis. The laboratory illustrates the variety of methods used to study the above topics.

488 Advanced Topics in Chemistry.

A non-credit seminar to be given by invited speakers which must be taken by all 4th year honours Chemistry students.

8880 Honours Examination.

This is an additional class required of all Honours students in Chemistry in order to satisfy requirements 5.3.5.1(c) or 5.3.5.2(d) of Academic Programmes. It should be taken in the final year of a concentrated chemistry honours programme. All honours students, whether in concentrated or unconcentrated programme, must consult with the professor in charge of the Honours Thesis Programmes (B.J. Forrest).

Graduate Studies
The department offers graduate classes leading to a degree of M.Sc. (both Full Time and Part Time) and Ph.D. Details of these programmes are in the Calendar of the Faculty of Graduate Studies.

Classics

Chairperson of Department
R. Friedrich

Professor Emeritus
J.A. Doull, B.A. (Dal.), M.A. (Tor.)

Professors
A.H. Armstrong, M.A. (Cantab.), F.B.A.
J.P. Atherton, M.A. (Oxon.), Ph.D. (Liverpool)
R.D. Crouse, B.A. (Vind.), S.T.B. (Harv.), M.Th. (Trin.), Ph.D. (Harv.) D.D. (Trin.)
R. Friedrich, Dr.phil. (Goettingen)
G. Grant, B.A. (Queen's), D.Phil. (Oxon.), D.Lit. (Mt.A.), LL.D. (Dal.), LL.D. (Queen's), LL.D. (Tor.), F.R.S.C.
T.E.W. Segelberg, D.Th., F.K. (Upsala)

Associate Professors
W.J. Hankey, B.A. (Vind.), M.A. (Tor.), D.Phil. (Oxon.)
P.F. Kussmaul, Dr.phil (Basle), Dr.phil.habil. (Heidelberg)

C.J. Starnes, B.A. (Bishop's), S.T.B. (Harv.), M.A. (McG.), Ph.D. (Dal.) *Graduate Studies Advisor.*

Assistant Professors
D.K. House, M.A. (Dal.), Ph.D. (Liverpool), *Graduate Studies Adviser.*

Post Doctoral Fellow
W.J.T. Kirby, B.A. (Vind.), M.A. (Dal.)

Classics is the study of our origins - how the Christian-European tradition to which we belong arose out of the ancient civilizations of the Mediterranean area. The fundamental ideas and beliefs of Europeans and North Americans, by which we 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 our own contemporary culture, we must study its historical origins.

Classics is more than the study of ancient languages. Languages are not learned for themselves, but because they are necessary for the scientific study of ancient history, literature, religion, mythology and philosophy. The Classics Department at Dalhousie provides instruction both in these subjects and in ancient languages. While previous preparation in one or more ancient languages is desirable, it is nevertheless quite feasible for a student who discovers an interest in classics to begin his language studies at university.

Students of classics usually learn Greek and Latin. Instruction may also be had in Hebrew, Coptic, Syriac and Arabic.

It is obvious that classics is worth studying for its own sake by students who wish to obtain a better understanding of the common assumptions and beliefs of our 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 prepares students for a life of teaching and scholarship in several directions. Canada is responsible for its own culture, and we have great need of scholars and teachers who know about our origins. Teachers of classics for schools and universities are hard to find in Canada. 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 mediaeval studies in general. Classics leads also to ancient Near Eastern Studies (Jewish, Babylonian, Egyptian, etc.) and to archeology.

Degree Programmes

B.A. and B.Sc.
Of classes offered by the department, Classics 1010, 1020, 1030, 2000 and 2070 and those classes in Ancient History and Religions and Ancient and Mediaeval Philosophy not having a Language prerequisite should be especially useful to students taking a bachelor's degree. All classes beyond the 1000 level are available for *major and minor programmes* in classics, and the Department is glad to assist students in working out programmes according to their interests.

Honours Programmes
The candidate may choose between three programmes: B.A. with Honours in Classics (Ancient Literature), B.A. with Honours in Classics (Ancient History), or B.A. 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, Ancient History and Ancient and Mediaeval Philosophy classes may be counted either as Classics credits, or as History and Philosophy credits, respectively.

To receive an Honours degree in Classics:
(1) Students must complete nine to eleven classes in Classics beyond the 1000 level

chosen in accord with the general Faculty regulations for Honours.
(2) The programme must include work in either Greek or Latin Language and Literature to the 3000 level and work in the other language to an appropriate level as determined by the Undergraduate Adviser.
(3) The programme must be approved by the Undergraduate Adviser.

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.

Combined Honours
Classics may be taken as part of a combined honours programme with French and German. Students interested in either of these programmes should consult with the chairmen of the respective departments.

Undergraduate Adviser
The programmes of all students majoring or honouring in the Department must be approved by the Undergraduate Adviser. Currently, Professor Hankey holds the position.

Changes and Additions
As the Calendar goes to press before all plans for the next academic year are completed, there may be significant changes in the classes listed below. Students should consult the Department for names of instructors and revisions.

Classes Offered
Literature, History and Philosophy

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.

Introductory: Origins of the West

Classics 1010 Ancient History: An Introduction to the Cultural History of the Ancient World, Lect. 2 hrs.; D.K. House.

The first term is devoted to a study of the major pre-classical civilizations (Sumer, Egypt, etc.) with attention paid to the art, religion and social forms of these cultures as well as their political development; in the second term the civilizations of Greece, Rome, and Israel are studied, and their issue in the Early Christian world considered.

As the class is intended as an introductory one, no special preparation is expected, and there is no foreign language requirement.

Classics 1020 Archeology and Art, Lect. 02 hrs.; W.J. Hankey, J.P. Atherton, P.F. Kussmaul.

A study of Greco-Roman civilization through its visual art. The class weill cover the period from 800 B.C. to A.D. 800.

This is an introductory class; no special preparation is expected and there is no foreign language requirement.

Classics 1030 Origins of Western Thought: Introduction to Ancient Philosophy, Lect. 2 hrs.; J.P. Atherton, W.J. Hankey.

An introduction to classical culture through a study of its philosophical ideas. The ideas are presented in the religious, literary, and social context of their historical development.

Classics 2000 Classical Literature, Lect. 2 hrs.; R. Friedrich, R.D. Crouse, C.J. Starnes and others.

An introduction to classical civilization by way of the literature, read in English translations. Authors studied are Homer, the Greek Dramatists, Plato, Vergil and St. Augustine.

Classics 2100 Classical Mythology, Lect. 2 hrs.; E. Segeberg.

This class is designed as an introduction to the mythology and religion of ancient Greece and Rome. First the major gods and godesses, their worship and their myths will be studied; then the major cycles of Greek and Roman heroic mythology (the Trojan War, the Argonaut expedition, the cycles centering on Hercules, Perseus, Theseus and Aeneas) as they were recounted in Vergil, Ovid and in the visual arts.

This class is also **open to first year students.** All texts read in translation.

Ancient History and Religions

Classics 2200 Ancient History: The Ancient City, Lect. 2 hrs., P.F. Kussmaul.

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 2210.

Classics 2210 Roman History: The Roman Empire and the Rise of Christianity, Lect. 2 hrs.; P.F. Kussmaul.

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 2200.

Classics 2220 Greek History, Lect. 2 hrs.; D.K. House.

Given alternately with Classics 2230*.

Classics 2230 Roman History: The Cultural History of the Roman World, Lect./seminar 2 hrs.; D.K. House.

Given alternately with Classics 2220*.

Classics 3280/5280 Christian Beginnings and the Early History of the Church, Seminar 2 hrs.; E. Segelberg.

The study of the beginnings of the Christian Church against its Jewish background within the Hellenistic culture. The history of the Church is followed up through the first 3-4 centuries. Emphasis is in alternate years on various features such as the development of Christian Initiation, the Eucharist or Ministry and Authority.

Classics 3290/5290 Greek Religion, Seminar 2 hrs.; E. Segelberg.

The history of Greek Religion, with particular attention to the interpretation of myth.

Classics 3260/5260 Roman Religion, Seminar 2 hrs.; E. Segelberg.

Classics 3270/5270 Near Eastern Religion, Seminar 2 hrs.; E. Segelberg.

Classics 3520/5520 Seminar on Problems of the Hellenistic period, Seminar 2 hrs.; E. Segelberg.

Religions in the Hellenistic Period.

Classics 4530/5530 Seminar on the Roman Empire and the Rise of Christianity, Seminar 2 hrs.; J.P. Atherton, P.F. Kussmaul.

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.

Classical Literature

Classics 3510 Ancient and Modern Drama (same as Comparative Literature 3510) Sem. 2 hrs.; R. Friedrich.

This class is a study of Western drama from its ritual beginnings in ancient Greece to its 20th-century forms. The first part deals with Greek theatre: the ritual origins of drama, the Dyonysian festivals, production and stage conventions. This is followed by a study of Greek and Roman tragedies and comedies, accompanied by a reading of Aristotle's **Poetics** and Horace's **Art of Poetry.** In the second part the influence of the ancients on the formation of European drama and dramatic theory is traced by a study of a number of plays ranging from Shakespeare to 20th-century drama, each representing a type, or period, of European drama.

All plays (and other texts) will be studied in translation.

Classical Philosophy

Classics 3300/5300 History of Christian Doctrine to Augustine, Lect. 2 hrs.; C.J. Starnes, W.J. Hankey.

The meaning of Christian doctrines in relation knowledge knowledge beginnings class, the Theologica. attention the examining to their Jewish and Greek origins and their development in the classical world. The basic text is Augustine, *The City of God.*

Classics 3360, Ancient Philosophy from its Beginning to the Sixth Century A.D., (same as Philosophy 336), Lect. 2 hrs.; W.J. Hankey, J.P. Atherton.

A survey of the whole history of ancient Greek philosophical thought from its beginnings in Ionia in the sixth century B.C. to the end of the public teaching of Greek philosophy by non-Christians in the sixth century A.D. Proper attention is paid to the great classical philosophies of Plato and Aristotle studied in their historical context; and much emphasis is laid on the Greek philosophy of the first centuries A.D. and its influence on developing Christian thought.

Classics 3370/5370 History of Christian Doctrine II: From Augustine to Calvin, W.J. Hankey*.

The class considers the theological development of matters like the Trinity, Incarnation, predestination, the nature of man and the sacraments by mediaeval thinkers.

Classics 3380 Mediaeval Philosophy, (same as Philosophy 338), Lect. 2 hrs.; R.D. Crouse.

A study of the development of philosophy in the formative age of European civilization related political, institutional, literary and theological concerns. An attempt is made to show how legacy of classical and Christian antiquity was appropriated and reformed to constitute the ideology of mediaeval Christendom. The lectures are devoted mainly to the study and discussion of a few fundamental texts, beginning with Boethius' *Consolation of Philosophy*. Special is given to Anselm's *Proslogion* and the first few questions of Thomas Aquinas' *Summa It is the object of lectures to present the continuity of the historical development and to emphasize broad implications of the philosophical doctrines presented in the texts. In the later part of the attention is given to late mediaeval Platonism and Mysticism, to show something of the of Reformation and modern philosophical and religious thought.*

Classics 3400 The Dialogues of Plato, Seminar 2 hrs; D.K. House.

This class presupposes some knowledge of the history of Ancient Philosophy, and some of Greek.

Given alternately with Classics 3500.

Classics 3410 St. Augustine's Confessions, Seminar 2 hrs.; C.J. Starnes.*

This class presupposes some knowledge of the history of Ancient Philosophy, and some of Latin.

Classics 3450/German 345 Hegel's Philosophy of Nature, J.A. Doull, W.J. Hankey.

Hegel's Philosophy of Nature and its relation to ancient physics and modern science. The class endeavours to discover in what sense a thinking of nature in essential continuity with ancient physics is currently possible or in what sense modern natural science constitutes a philosophy of nature.

Classics 3470, Reading and Research: Ancient Literature.

Classics 3480, Reading and Research: Ancient History.

Classics 3490, Reading and Research: Ancient Philosophy.

Classics 3500 Aristotle, Seminar 2 hrs.; J.A. Doull, D.K. House, W.J. Hankey.

This class studies a treatise of Aristotle, usually the *De Anima* or the *Physics*. It presupposes some knowledge of Ancient Philosophy and some knowledge of Greek.

Classics 4200/5670 Ancient Practical Philosophy, Seminar 2 hrs.; J.A. Doull, W.J. Hankey, G.P. Grant.

Classics 4300/5600 Seminar on the Philosophy of Aristotle, Seminar 2 hrs.; J.A. Doull, W.J. Hankey, G.P. Grant.

Classics 4310/5610 Seminar on the Philosophy of Plato, Seminar 2 hrs.; J.A. Doull, G.P. Grant

Classics 4320/5620 Ancient and Modern Dialectic, Seminar 2 hrs.; J.A. Doull.

Dialectical method in Fichte, Schelling and Hegel in relation to Plato and Aristotle.

Classics 4400/5700 Seminar on the Philosophy of the Church Fathers, R.D. Crouse.

Classics 4450/5640 Mediaeval Interpreters of Aristotle, Seminar 2 hrs; J.P. Atherton, R.D. Crouse, W.J. Hankey.

Classics 4500/5800 Seminar on Neoplatonism, Seminar 2 hrs.; J.P. Atherton, W.J. Hankey, D.K. House.

Topics from the history of Neoplatonism and its relation to the theology of the Greek Church are studied.

Classics 4580/5580 Reading and Research.

Classics 4900/5900 Departmental Seminar, Seminar 2 hrs.

Classical Languages and Literature

Greek 1000 Introductory Greek, Lect. 3 hrs.; D.K. House, R. Friedrich.

This is the beginner's class in the Greek language, and no previous knowledge is required. The aim is to teach the student to read a Greek text. After he has become accustomed to the new alphabet - which does not take long - the study of grammar is introduced along with reading and translation of texts from original Greek literature.

Greek 2000 Intermediate Greek, Lect. 3 hrs.; R. Friedrich, D.K. House.

Greek 2000 is a continuation of Greek 1000. The aim is to develop the student's ability and to read and translate prose as well as poetic Greek texts.

Greek 3000 Advanced Greek, Seminar 2 hrs.; J.A. Doull, D.K. House, R. Friedrich. *Prerequisite:* Greek 2000.

This class which reads both a prose and a poetic work is the normal third class in Greek.

Greek 3010/5010 Greek Epic, Seminar 2 hrs.; R. Friedrich. *Prerequisite:* Greek 2000.

Greek 3020/5020 Greek Lyric, Seminar 2 hrs.; staff. *Prerequisite:* Greek 2000.

Greek 3030/5030 Greek Drama: Tragedy, Seminar 2 hrs.; R. Friedrich. *Prerequisite:* Greek 2000.

Greek 3040/5040 Greek Drama: Comedy, Seminar 2 hrs.; R. Friedrich. *Prerequisite:* Greek 2000.

Greek 3050/5050 Greek Philosophical Texts I, Seminar 2 hrs.; staff. *Prerequisite:* Greek 2000.

Greek 3060/5060 Greek Philosophical Texts II, Seminar 2 hrs.; staff. *Prerequisite:* Greek 2000.

Greek 3070/5070 Greek Philosophical Texts III, Seminar 2 hrs.; staff. *Prerequisite:* Greek 2000.

Greek 3080/5080 Greek Historians, Seminar 2 hrs.; staff. *Prerequisite:* Greek 2000.

Greek 3090/5090 Greek Literary Criticism, Seminar 2 hrs.; R. Friedrich. *Prerequisite:* Greek 2000.

Greek 3100A & B Reading and Research, Seminar 2 hrs.; staff. *Prerequisite:* Greek 2000.

Greek 3120 Biblical Greek

This class enables the student who already knows the basics of Classical Greek to familiarize himself with koine-Greek as it is found in various *New Testament* authors. The Greek of the *Septuagint* will also be taken into account.

Greek 4100/5100A/B Reading and Research, staff. *Prerequisite:* any 3000-level class.

Latin 1000 Introductory Latin, Lect. 3 hrs.; C.J. Starnes.

An introduction to Latin through the study of its basic grammar.

Latin 2000 A Study of Latin Prose and Poetry, Lect./Discussion 2 hrs.; P.F. Kussmaul.

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.

Latin 2040 Latin Philosophical Texts, Lect. 2 hrs.; R.D. Crouse. *Prerequisite:* Latin 1000 or Senior Matriculation in Latin.

The purpose is to give students experience in reading philosophical Latin. Various authors are read from Cicero to the late Middle Ages.

Latin 2060 Latin Historical Texts, Lect. 2 hrs.; J.P. Atherton.

Latin 3500/5500 Roman Satire, Seminar 2 hrs.; staff.

Latin 3510/5510 A Study of Vergil, Seminar 2 hrs.; J.P. Atherton. *Prerequisite:* A class in Latin at the 2000 level.

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.

Latin 3520/5520 Advanced Reading in Latin Literature, staff.

Latin 3600/5600 Latin Religious Poetry, Seminar 2 hrs.; J.P. Atherton, P.F. Kussmaul.

A study of religious poetry written in the Latin language from the *Carmen Saliare* (680 B.C.) to Calvin's *Epinicon* (1544 A.D.) and the poems of Leo XIII (1890 A.D.).

Latin 4000/5000 Reading and Research, staff.

Latin 4050/5050 Reading and Research, staff.

Near Eastern Languages

The classes in Hebrew, Coptic, Syriac and Arabic, are available as electives at the discretion of the Department, only in relation to the needs of the particular student.

Note: The classes in Hebrew and Arabic are taught by the Atlantic School of Theology.

Hebrew
1010 Elementary Hebrew and Introductory Readings.

2020 Intermediate Hebrew.

3030 Advanced Hebrew.

Coptic
1010 Introduction to the Coptic (Sahidic) Language and Literature, E. Segelberg.

2000 Reading of Selections from other Coptic Dialects, E. Segelberg.

3010 Selected Coptic Texts, E. Segelberg.

4020/5020 Reading of Coptic Texts, E. Segelberg.

Partly Nag Hammadi Papyri, and partly Manichaean texts.

Syriac

1000 Introduction to the Syriac Language and Literature, E. Segelberg.

2000 Syriac Language and Literature, E. Segelberg.

Reading of some early writers such as Aphrates and Aphrem, the famous hymnographer.

3000 Advanced Syriac, E. Segelberg.

Reading of selected Patristic texts.

Arabic

Students wishing to take a class in Arabic must consult with the Department before registering for the class.

1000 Introductory Grammar and Reading of Texts.

2000 Intermediate Arabic.

Special Topics

Classics 4910A/4920B Special Topics
Greek 4910A/4920B Special Topics
Latin 4910A/4920B Special Topics

Comparative Literature

A. Andrews (Theatre)
J.A. Barnstead (Russian)
S.A.M. Burns (Philosophy)
R. Friedrich (Classics) (Chairman)
F. Gaede (German)
R.M. Huebert (English)
S. Jones (Spanish)
J.M. Kirk (Spanish)
R.M. Martin (Philosophy)
S. Mendel (English)
H.R. Runte (French)
M.C. Sandhu (French)
H.G. Schwarz (German)
H.S. Whittier (English)

COMPARATIVE LITERATURE, despite its name, is not so much defined by 'comparisons' as by studies involving literary works which belong to more than one literature and language. The idea of a national literature (English literature, French literature, Canadian literature, etc.) is of relatively recent date. It originated in the 18th century with the rise of national consciousness; yet at the same time the traditional broad unity of all literatures reasserted itself in Goethe's concept of 'world literature.' In Comparative Literature the literary work is treated in its double aspects of belonging to a national literature as well as forming part of world literature. Comparative Literature has various approaches. It implies the study of *themes* and *motifs* (e.g. Faust, myths, etc.) as they recur in literary works of different ages and literatures; of *literary genres* such as drama, epic or romance; of *periods* (e.g. Renaissance, 18th century, etc.); of authors writing in different languages but linked by influences; of the *reception* of the work of an author in another literature (e.g. Shakespeare in Germany). The relationships of literature to the other arts (e.g. film, the fine arts, music, etc.) may also be a subject of Comparative Literature; and last but not least, Comparative Literature forms a bridge between literature and other fields in the humanities such as philosophy, religion, and politics.

The Departments of Classics, English, French, German, Philosophy, Russian, Spanish and Theatre offer the following classes in Comparative Literature. Classes which are cross-listed may form part of an area of concentration. All lectures are given in English and works are read in English translation unless otherwise noted.

Classes Offered

Note: At present the Comparative Literature Programme is being fundamentally revised; the entries may therfore be outdated at the time when this Calendar will be published. Students interested in the Comparative Literature Programme should contact R. Friedrich, Classics Department, 424-3468; or H.R. Runte, French Department, 424-2430.

100 Introduction to Comparative Literature

This is an introduction to the understanding of man's approach to the problems of life through the study of selected masterpieces of European literature which may include works by Dante, Chaucer, Cervantes, Shakespeare, Molière, Goethe, and others.

Note: English 100 or Classics 100 is acceptable as an equivalent to Comparative Literature 100.

201 The History of the Theatre, A Andrews.

Note: This class is cross-listed as Theatre 2010.

203 Masterpieces of Western Literature, H.S. Whittier.

Note: This class is cross-listed as English 203.

204 The European Novel, S. Mendel.

Note: This class is cross-listed as English 204.

*** 207 Ancient Drama in Relation to Modern Drama,** R. Friedrich.

Note: This class is cross-listed as Classics 207.

*** 210 Theories and Manifestations of Love in Medieval Europe,** H.R. Runte.

A literary and anthropological study of major poetic, romanesque, and dramatic works by English courtly poets, French troubadours, and German Minnesänger, with special emphasis on their relation to our time.

*** 212 Realism and the 18th Century Enligh and French Novel,** R. Runte.

Novels by such authors as Marivaux, Richardson, Prévost, Fielding, Rousseau, Diderot, Smollett, and Laclos are studied. Aspects of realism in style and structure provide the basis for comparison/contrast of the works read.

*** 214 Arthurian Romances,** H.R. Runte.

A historical, archaeological, cultural and literary investigation of French, English, and German Arthurian texts dealing with the medieval legend of King Arthur and the Knights of the Round Table. All readings in modern English translations.

*** 215 Women in Literature and Society,** R. Runte.

A panel of professors present women as authors and the role of the woman and her portrait in literature as a reflection of society in England and France with appropriate references to Italy and Germany. The development of the woman's image is studied chronologically with reference to contemporary themes and problems.

217 Faust — A Secular Path to Salvation

Note: This class is cross-listed as German 215.

218 Germanic and Greek Mythology

Note: This class is cross-listed as German 235.

237 Restoration and 18th Century Comedy, R. Runte.

A comparative study of English and French plays by such authors as Wycherley, Etherege, Congreve, Steele, Sheridan, Molière, Lesage, Marivaux, Voltaire, and Beaumarchais. Critical essays on comedy are studied with a view to defining the universal, national and temporal nature of comic elements in the works read.

270 Philosophy in Literature, R.M. Martin.

Note: This class is cross-listed as Philosophy 270.

350 The Modern Theatre, A. Andrews.

Note: This class is cross-listed as Theatre 3500.

490 Dramatic Theory and Criticism, and the Aesthetics of the Theatre, A. Andrews.

Note: This class is cross-listed as Theatre 4900.

Computing Science

There are a variety of programmes now offered leading to a B.A. or B.Sc. with a concentration in Computing Science.

Computing Science as an area of Concentration

Students who plan to major in Computing Science should arrange a programme in consultation with the Department of Mathematics, Statistics and Computing Science.

Majors in Computing Science must obtain at least four (and no more than eight) credits beyond the 100 level in Computing Science.

In addition to the necessary first year prerequisites (i.e. Math 100, Comp. Sci. 140, 141) the following classes are required in all programmes:

2nd year	CS 245, CS 261	3rd year	CS 369, CS 370

It is strongly recommended that the following classes are also included in a programme:

1st year	Math 101	2nd year	Math 203, Math 204, CS 235, CS 227.

Computing Science 235 is especially recommended for those interested in business or administrative computing and CS 227 is especially recommended for those interested in science and engineering applications.

Students who wish to arrange inter-disciplinary programmes (with fields such as Mathematics, Physics, Economics, Psychology and others) are invited to discuss their interests with the department.

Honours in Computing Science

A concentrated Honours programme has been specially approved for Computing Science. Students are required to take the following courses:

1st year	Math 100, Math 101, CS 140, CS 141	2nd year	Math 207, Math 208 Math 213 *or* Math 203, Math 204 CS 245, CS 235, CS 261, CS 227
3rd year	Math 303, CS 369, CS 370.		

For the purposes of Regulation 5.3.5.1(a)(i), for this degree, Math 303 and Math 207, 208 are counted as Computing Science courses, and consequently may not be counted toward a minor in Mathematics. All other faculty and departmental requirements must be satisfied. See the Director of Computing Science for programme information.

Combined Honours

Students interested in taking honours in Computing Science and another subject as a combined programme should consult the departmental chairman through whom a suitable course of study can be arranged.

A combined honours programme may well be in 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.

Co-operative Education Programmes

The department offers two Co-op education programmes involving Computing Science, a concentrated programme in Computing Science and a combined programme with Mathematics. Both these programmes are Honours programmes. Students enrolled in the Computing Science Co-op are required to take all the courses Computing Science honours students are required to take.

Further information about the Co-op programmes is included under the Calendar entry for Mathematics. Interested students should note that some Departmental regulations for Co-op students differ from those regulations affecting straightforward Honours students.

Any student who is interested in enrolling in a Co-op programme is urged to contact the Director of Co-op Education as early as possivle in their academic career for course advice and other information.

Other Information

The Department now operates a large VAX-750 Unix system for Computing Science students and staff. This machine is networked to other similar machines in Computing Science departments across the continent. The terminal laboratory is located on the fourth floor of the Killam Library. A variety of microcomputers is also available in the department.

Students who complete the first two years of a Dalhousie programme in Computing Science may complete their programmes at Dalhousie or may be able to transfer to the Technical University of Nova Scotia (TUNS) to complete a Bachelor of Computing Science with Engineering options. Further information about the classes required for admission to a TUNS programme may be obtained from the Department of Mathematics, Statistics and Computing Science or TUNS.

A student may not received credit for both CS 140 and Engineering 240 or either of the previous classes Math 225 (in 1978-79) or CS 240. The latter two classes may be used instead of CS 140 as prerequisite for further CS classes.

A student may not receive credit for both CS 141 and the previous class CS 240 in 1978/79. Whenever CS 141 is a prerequisite the latter serves instead. Note that credit may not be obtained for the same class twice even if the number has been changed (e.g. 261 is the same as the former 360).

Classes Offered

140A/B Introduction to Computing Science, Lect. 3 hrs.; Tut. 1 hr. *Prerequisites:* Nova Scotia Math 441 or equivalent.

This class together with CS 141 provides a general introduction to algorithmic concepts, structured programming, and Computing Science. Students develop programming skills in a higher-level language such as COBOL 74; Pascal or Fortran 77, with emphasis on structured programming. The exercises involve primarily non-numerical tasks including character manipulation and sequential file processing.

141B Applications and Algorithms, Lect. 3 hrs.; Tut. 1 hr. *Prerequisites:* CS 140 and Math 100.

This is a continuation of CS 140. The applications tend to be more mathematical and include numerical calculations with truncation and rounding errors, statistics, modeling and simulations, data processing, non-numerical applications involving networks and graphs, interpreters and translators. Students are introduced to elementary data structures and algorithm analysis.

227B Introduction to Numerical Linear Algebra, Lect. 3 hrs. (Same as Mathematics 227B.) *Prerequisites:* Math 101, 203 and CS 141 (with a grade of B- or better).

We begin by examining the floating point number system and its arithmetic. Next, we investigate the numerical solution of systems of linear equations, examining Gaussian Elimination and some iterative methods. The idea of condition numbers, both of a problem and an algorithm, is introduced, together with some techniques of estimating the condition number of a matrix. The Singular Value Decomposition of a matrix and generalized inverses is also examined. The Modified Gram Schmidt process, the solution of undetermined linear systems, and overdetermined linear systems using a least squares approach, are discussed. Reference is also made to various software libraries available, including LINPACK. Time permitting, interpolation is also discussed.

235B Introduction to File Processing, Lect. 3 hrs.; *Prerequisite:* CS 261 (with a grade of C- or better).

This class begins with a review of sequential file algorithms. However, the primary subject is direct-access file systems and the various access methods. Some of the theoretical topics covered include hashing and tree data structures appropriate for file directories. Internal and external sorting methods are covered in considerable detail.

245A Introduction to Computer Systems, Lect. 3 hrs. *Prerequisite:* CS 141 (with a grade of B- or better).

An introduction to machine architecture from the perspective of an assembly language programmer. Students gain familiarity with an assembly language and the translation process needed to produce machine code. Common addressing modes, macros and file I/O are discussed together with the internal structure of memory, control units and processing units.

261A (formerly 360) **Data Structures and Algorithmic Analysis,** Lect. 3 hrs. *Prerequisite:* CS 141 (with a grade of B- or better).

Data types and the operations on them are covered in this class, including stacks, queues, trees and various linked structures. The efficient representation of graphs and the corresponding algorithms are discussed. Considerable emphasis is placed on the analysis of algorithms.

304A/B Introduction to Computer Organizations, Lect. 3 hrs. *Prerequisite:* CS 245 (with a grade of C- or better).

An introduction to logic design and detailed computer architecture. Basic logic elements such as gates and flip-flops are discussed and the design of combinational networks, registers and control mechanisms analyzed. Internal representation and arithmetic, communication between components, instruction fetch and sequencing, interrupts and I/O controllers are also discussed.

*** 309A/B Computers and Society,** Lect. 3 hrs. *Prerequisite:* CS 141 (with a grade of B- or better).

The impact of computers on society is discussed in this class. Topics include the history of computing and technology, the place of the computer in modern society, legal issues such as the copywriting of software, the computer scientist as a professional, the impact of databanks on individual privacy and the public perception of computers and computer scientists.

321A (formerly part of 320) **Introduction to Numerical Analysis,** Lect. 3 hrs. (same as Mathematics 321A). *Prerequisites:* Mathematics 200 and CS 227.

See class description for Mathematics 321A.

*** 322B Numerical Solutions of Ordinary Differential Equations,** Lect. 3 hrs. (same as Mathematics 322B). *Prerequisites:* CS 321 and Mathematics 311, 309.

See class description for Mathematics 322B.

325A/B Data Base Management Systems Design, Lect. 3 hrs. *Prerequisites:* CS 261, CS 235 (with grades of C- or better).

The concepts and structures necessary to design and implement a data base management system are stressed. Hierarchical, network and relational models are discussed with emphasis on the

necessary logical and data structures. Various normal forms and canonical schema are discussed as well as the concepts of relational algebras and relational calculus.

369A (formerly 270) **Programming Languages,** Lect. 3 hrs. *Prerequisite:* CS 261 (with a grade of C- or better).

The emphasis is on fundamental concepts such as block structure and recursion and structured control flow. Exercises are given in several languages such as Algol or Pascal, Snobol, Lisp and APL. On completion of this class students should be competent programmers, able to program in any language given appropriate reference material.

370A/B Operating Systems I, Lect. 3 hrs. *Prerequisite:* CS 261 (with a grade of C- or better). *Recommended:* Mathematics 207-208.

This class covers the principles of modern operating system design with examples from existing systems. Specific topics include: concurrent processes, interprocess communication, synchronization, scheduling policies, multi-level storage management, and associated algorithms.

*** 375B Artificial Intelligence,** Lect. 3 hrs. *Prerequisite:* CS 369 (with a grade of C- or better).

An introduction to basic concepts and techniques of artificial intelligence or systems with insights given into active research areas and applications. Representational issues and notational structures are emphasized and existing systems are surveyed. Students work on a fairly large project using LISP.

381B (formerly Physics 421) **Microcomputers in the Real World,** Lect. 3 hrs. (same as Physics 3810B). *Prerequisites:* CS 245 (with a grade of C- or better), Physics 2200A/2210B or 2110/2120.

See class description for Physics 3810B.

*** 410A/B Operating Systems II,** Lect. 3 hrs. *Prerequisites:* CS 370B (with a grade of C- or better), Mathematics 207-208.

A further development of the material of Operating Systems I. Topics include concurrent processes, address space management, resource allocation, multiprogramming systems, protecting access to objects, pipelining, user interfaces and networks.

*** 413A/B Analysis of Algorithms,** Lect. 3 hrs.; (Same as Math 413 A/B.) *Prerequisite:* CS 369 (with a grade of C- or better).

This class covers algorithmic solutions to a wide variety of problems and a formal analysis of their complexity. It is a continuation of the 261 class. Problems are taken from combinatorics and numerical computation including algorithms for unordered and ordered sets, graphs, fast multiplication, prime testing, factoring, polynomial arithmetic and metric operations. Other topics include the analysis of algorithms used in systems programming and artificial intelligence such as pattern matching for text processing and algorithms in natural language processing.

*** 414A/B Software Design and Development,** Lect. 3 hrs. *Prerequisite:* CS 369 (with a grade of C- or better).

This class involves a formal approach to state-of-the-art techniques in software design and development. Students work in teams in the organization, development and management of a large software project. Formal models of structured programming, stepwise refinement and reorganization, top-down design, strength and coupline measures, milestones and estimating, chief-programmer teams, program libraries and documentation are included.

*** 415A/B Theory of Programming Languages,** Lect. 3 hrs. *Prerequisite:* CS 369 (with a grade of C- or better).

This is a class in the formal treatment of programming language translation and compiler design concepts. Topics include lexical analysis and parsing with emphasis on the theoretical aspects of parsing context-free languages, translation specification and machine-independent code optimization. Finite state grammars, lexical scanners, and context-free parsing techniques such as LL(k), procedence, LR(k), SLR(k) are included.

*** 427A/B Numerical Software,** Lect. 3 hrs.; (Same as Math 427 A/B). *Prerequisite:* CS 321 (with a grade of C- or ntation of reliable programmes and libraries for numerical computation are implemethe foci of this class. Program libraries such as EISPAC, LINPAC and IMSL are reviewed. Particular attention is paid to the choice of subroutine parameters and the tradeoffs between convenience, simplicity and generality.

*** 466A/B Automata and Computability,** Lect. 3 hrs. (same as Mathematics 466A/B). *Prerequisites:* CS 141; a 300 level Mathematics class such as 303.

This class deals with finite state, pushdown and linear bounded automata; their correspondents in the Chomsky hierarchy for formal grammars and Turing machines. Appropriate closure properties and non-determinism are discussed as well as computable and noncomputable functions and the Halting problem.

8700 (non credit) Co-op Seminar

8891 Co-op Work Term I

8892 Co-op Work Term II

8893 Co-op Work Term III

8894 Co-op Work Term IV

Economics

Chairperson of Department
E. Klein

Professor Emeritus
Z.A. Konczacki, B.Sc. (Lond.), B.Econ.Hons. (Natal), Ph.D. (Lond.)

Professors
R.L. Comeau, B.A., M.A. (St.F.X.), Ph.D. (Brown)
J.L. Cornwall, B.A. (Iowa), M.Sc. (Lond.), Ph.D. (Harv.) *Coordinator of Graduate Studies*
R.E. George, B.Sc. (Lond.), M.A. (Brist.), Ph.D. (Lond.) *William A. Black Professor of Commerce*
J.F. Graham, B.A. (U.B.C.), M.A., Ph.D. (Col.), F.R.S.C. *Fred C. Manning Professor of Economics*
E. Klein, LL.M. (Buenos Aires), M.Sc. (Dal.), Dr. Rer. Pol. (Hamburg)
C.T. Marfels, Dr. Rer. Pol. (Berlin)
R.I. McAllister, M.A. (Oxon.), M.A. (Cantab.)
N.H. Morse, B.A., M.A. (Acad.), Ph.D. (Tor.)
A.M. Sinclair, B.A. (Dal.), M.A., B.Phil. (Oxon.), Ph.D. (Harv.)

Associate Professors
F.M. Bradfield, B.Comm. (McM.), Ph.D. (Brown)
M.G. Brown, B.A. (W.Ont), M.A. (Queen's), A.M., Ph.D. (Chi.)
P.B. Huber, B.A., M.A., Ph.D. (Yale)
G. Kartsaklis, C.E. (Athens), Dr. Rer. Pol. (Bonn)
B. Lesser, B.Comm. (Dal.), M.A., Ph.D. (Corn.)
L. Osberg, B.A. Hons. (Queen's), M.Phil., Ph.D. (Yale)
U.L.G. Rao, M.A., M.Sc. (Andhra), Ph.D. (W.Ont.)

Assistant Professors
M.L. Cross, B.A. (Montana), M.A. (S.F.U.), Ph.D. (Texas A. & M.)
S. DasGupta, B.A. (Calcutta), M.A. (Delhi), M.A., Ph.D. (Rochester)
B.M. Jamieson, B.A. (U.B.C.), M.A., Ph.D. (Tor.)
R.L. Mazany, B.S.F.S. (Gorgetown), Ph.D. (U.B.C.)

Lecturers
M.S. Amirkhalkhali, B.A.Hons. (Shiraz), M.A. (Dal.)

Special Lecturer
E.W. Kierans, B.A. (Loyola), LL.D. (Hon.) (St. Thomas)
T.A. Pinfold, B.A., M.A. (W.Ont.), Ph.D. (Minn.)

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 and problems and goals. Economic man is rational man consuming, organizing and producing within a framework of laws and customs in an effort to use the limited resources of our world efficiently for the greatest satisfaction. It is not an easy science; indeed it is one of the most complex, difficult (and fascinating) areas of study you could choose in the university when you pursue it beyond its elementary levels, but some basic knowledge of economics is essential for any educated person. A more extensive knowledge of the subject is an invaluable complement to other fields of specialization such as law, commerce, politics and other studies in social sciences or humanities - and a specialization in the field can lead to a variety of interesting career opportunities.

B.A. Degree Programme (Three Years)
Students choosing to major in economics at the undergraduate level may do so in the three-year B.A. Programme or they may seek a higher level of specialization in the four-year Honours Programme. Several combined programmes may also be arranged with economics as the major or minor subject in association with such other fields as political science, sociology, history, geology, biology, mathematics - and possibly others.

Final programme approval for all majors' students must be obtained from the appropriate coordinator.

General Principles: The following programme arrangements are provided to the students as guidelines to facilitate the selection of classes appropriate to particular areas of interest. They should not, however, be construed as straitjackets nor as a reason for not seeking individual guidance from faculty members. In suggesting such programme frameworks, two principles have particular weight: (a) students taking economics as a major, or in an honours programme, should strike a balance between breadth of coverage among disciplines and depth of specialization in economics; (b) students taking economics as a minor or as a component of another specialization, such as commerce, should be allowed a reasonable degree of flexibility in their choice of economics classes.

General Format: Requirements for a major in economics can be satisfied by taking Economics 1100 or equivalent and any four other full-year classes, or equivalent, in economics. However, a student who desires to take a major in economics with more than the minimal requirements should undertake a programme of study along the following lines:

Year 1: Principles of Economics; Mathematics 100/101, or equivalent (usually Mathematics 110); and three classes in fields other than Economics.

Year 2 and 3: A minimum of 5 and a maximum of 8 classes in Economics; Classes in Political Science, History, Mathematics and other related subjects are to be taken to bring the total of classes over the three-year period to 15.

No more than one credit will be given for Economics 1100, 1105B, 1110 and 1120. For persons considering an honours degree, or any advanced work in economics, intermediate micro and macro economic theory classes and intermediate statistics (Economics 2228 or equivalent) are mandatory. No more than one-half credit will be given for Economics 2200A/B and 2220A/B, or for Economics 2201A/B and 2221A/B

Specific Programmes
Students wishing to take a set of classes which provide both depth and coherence in a particular area of economics should examine the following programme suggestions:

Canadian Development Studies, Economic Analysis and Policy, Economics and the Citizen, Economics and Government, Economic Development in Historical Perspective, International Development Studies, Labour and Society, Mathematical Economics and Econometric Methods, Regional and Urban Economics, or Resources and Environment.

The details of these programmes are in a brochure obtainable from the Department of Economics.

Students with interests not covered in the above-listed programmes are encouraged to set up their own programmes with the advice and approval of the Department. The Department is prepared to assist students who wish to devise their own programmes under the present curriculum regulations. Interested students should consult the Undergraduate Co-ordinator.

B.A. Honours Degree Programme (Four Years)

The necessary core classes for an Honours Degree in Economics are: Economics 1100 or 1110; 2220 (A or B); 2221 (A or B); 4420A; 3321B; 2228; Mathematics 100A/B and 101A/B or equivalent; a class in Economic History; a class in the History of Economic Thought. A minimum of nine classes in Economics, beyond the elementary level, is required.

The student's programme is chosen in consultation with the Department and must have the approval of the Department. The 21st mark required for the honours programme is based on an honours essay, graded on a pass/fail basis. Of the classes selected outside of economics in the third and fourth year, students must include at least two classes above the elementary level.

Since mathematics is required for graduate work in most good graduate schools, the value of econometrics and of additional mathematics is stressed. In some instances, the Department may permit students to take classes in other subjects in lieu of classes in economics and may permit minor variations in the required classes. Students must arrange their courses to ensure that they satisfy the overall requirements for the General B.A. degree.

Combined Honours
Combined honours programmes may be arranged with other departments. Combined programmes with Biology, Geology, History, Mathematics, Political Science or Sociology are available; others can be arranged by consultation. For combined honours programmes with economics where the major concentration is in the other discipline, students should consult the other departments concerned.

Classes offered

1100 Principles of Economics, Lect. 3 hrs.; Tutorial 1 hr. (optional); various members of staff.

For those lacking a background in economics, taken as the first in a series of classes in economics or as a background elective. Emphasis is on developing the basic analytical tools and applying them in the context of contemporary, and generally Canadian, economics problems. Section 5 of Economics 1100 offers a problem-oriented framework in which the analytical tools are developed by examination in each term of a specific question.

1101A/B * Principles of Microeconomics, Lect. 3 hrs.; Tutorial 1 hr. (optional); various members of staff.

Available only to students who have one half credit of introductory macroeconomics which is being transferred from another university, this class completes the principles of economics complement. Consult Department.

1102A/B * Principles of Macroeconomics, Lect. 3 hrs.; Tutorial 1 hr. (optional); various members of staff.

Available only to students who have one half credit of introductory microeconomics which is being transferred from another university, this class completes the principles of economics complement. Consult Department.

1105B * Principles of Economics, Lect. 6 hrs., Tutorial 2 hrs. (optional); various members of staff.

Available only to students who are enrolling for the first time in January or who are declared economics majors, in that order of priority. For description see Economics 1100. Consult Department.

1106A/B Introductory Statistics for Non-Mathematicians, Lect. 3 hrs. *Prerequisites:* Nova Scotia Mathematics or equivalent.

For description see Mathematics 106A/B.

1107A/B Statistical Techniques of Scientific Experimentation, Lect. 3 hrs. *Prerequisites:* Mathematics 106.

For description see Mathematics 107A/B.

1120 Principles of Economics, A Historical Approach, Lect. 2 hrs.; Tutorial 1 hr.; B. Lesser. *Note:* Economics 1120 is not open to Commerce students needing to satisfy their Economics 1100 requirements.

Episodes from Canada's past, such as the economic factors leading to Confederation, the development of the Prairie wheat economy, the building of the CPR, the beginnings of U.S. investment in Canada, and the Great Depression, are examined as a means of developing the basic analytical principles of economics.

2200A/B Intermediate Microeconomics, Lect. 3 hrs.; various members of staff. *Prerequisite:* Economics 1100 or equivalent.

An introduction to micro-economic theory and its applications which satisfies the minimum micro-economic theory requirements for majors and honours in economics. Of particular interest to Commerce students, or others not majoring in economics paying particular attention to applications of theory in a practical context. Microeconomic prerequisite for higher-level classes in economics. Note: Students may not take both 2200A/B and 2220A/B.

2201A/B Intermediate Macroeconomics, Lect. 3 hrs.; various members of staff. *Prerequisite:* Economics 1100 or equivalent.

Inflation, unemployment, exchange rate and related macro problems, with emphasis on Canadian policy experience in these areas. Of particular interest to commerce students or others not majoring in economics, serving as the macroeconomic prerequisite for higher-level classes in economics. Note: Students may not take both 2201A/B and 2221A/B.

2220A/B Micro-Economic Theory, Lect. 3 hrs.; (offered both terms). *Prerequisite:* Principles of Economics.

Micro-economics deals with the economic behaviour of households as purchasers of output and suppliers of input services, and of firms as producers of outputs and purchasers of inputs, as well as with the behaviour of groups of households and firms. In addition to standard topics, an introductory treatment of general equilibrium, external economies, and welfare economics is included. Emphasis is on theoretical ideas, while applications of these ideas are also considered. Of particular interest to those planning to major or honours in economics. Note: Students may not take both 2200A/B and 2220A/B.

2221A/B Macro-Economic Theory, Lect. 3 hrs.; (offered in both terms). *Prerequisite:* Principles of Economics.

The various models that economists use to analyze an economy at the macroeconomic level are developed, showing how they relate to the formulation of macroeconomic policy. Of particular interest to those planning to major or to do honours in economics. Note: Students may not take both 2201A/B and 2221A/B.

2222A Economic Statistics I, (same as Commerce 2501A/B), Lect. 3 hrs.; workshop 2 hrs.; various members of staff.

For description see Commerce 2501A/B.

2223B Economic Statistics II, (same as Commerce 2502A/B), Lect. 3 hrs.; workshop 2 hrs.; various members of staff.

For description see Commerce 2502A/B.

2228 Intermediate Statistics, Lect. 3 hrs., U.L.G. Rao. The student is expected to have at least a one-year course in calculus (Mathematics 110 or 100) and preferably linear algebra too.

The basic theory of mathematical statistics. An introduction to econometrics, this class concentrates on the theory of probability, discrete and continuous probability models, mathematical expection, moment generating functions, and statistical inference. The general linear model is also discussed. A critique of various problems that arise consequent to violations of the assumptions of the general linear model is presented as a preparation for applied econometric work and advanced work in econometrics.

2231A Health Economics, Lecture and seminar 3 hrs.; M.G. Brown. *Prerequisites:* Principles of Economics; Economics 2220A/B is desirable.

An examination of the allocation of resources to and within the health care sector of an economy. Characteristics claimed to be unique to the health care sector are analysed within an economic framework. Determinants of demand, supply and use of health services are examined with particular reference to the organization and evolution of Canada's health care system. This one-term survey class consists of a literature review, lectures, and student seminar presentations on selected topics. To accommodate part-time students the class meets during late afternoon or evening, one day per week.

2232 Canadian Economic History, Lect. 3 hrs.; N.H. Morse. As prerequisite, a class in economics principles and some knowledge of history would be beneficial.

The development of Canada from the age of discovery to now, presented in relation to the larger system of the relationships between the Old World and the New. As the class proceeds, the focus shifts more and more towards Canada and more formal theory is introduced in discussing Canadian problems and policies, especially in the twentieth century.

2238A * The Industrial Revolution in Europe, Lect. 2 hrs.; Z.A. Konczacki and P.B. Huber. *Prerequisite:* Introductory Economics or permission of Instructor.

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.

2239B * The European Economy in Historical Perspective: After the Industrial Revolution, Lect. 2 hrs.; P.B. Huber and Z.A. Konczacki. *Prerequisite:* Introductory Economics or permission of the Instructor.

A self-contained class (may be taken separately from Economics 2238A) examining the contrasting development patterns of various industrialized European countries after their respective industrial revolutions and up to about 1960. Focus is on the development of hypotheses regarding the causes and effects of differences in the experience of growth of mature economies.

2241A * Comparative Economic Systems: National Economies, Seminar 2 hrs.; P.B. Huber. *Prerequisite:* Introductory Economics.

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. There is no written examination. A student taking this class must understand the interrelated character of economic activity and grasp the nature of the price system.

2242B * Comparative Economic Systems: Economic Organization and Planning, Seminar 2 hrs.; P.B. Huber. *Prerequisite:* Introductory Economics, plus an additional half-class in Economics.

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.

2250 Applied Development Economics, Seminar 2 hrs. and tutorials; R.I. McAllister. *Prerequisite:* Introductory Economics.

Analysis of economic development theory and practice, with particular emphasis on developing countries and regions. There are three main elements: (1) policy and theory for economic development, focussing on foreign aid and regional aid; (2) development plans, budgets, and programmes - lessons from experiences of agencies such as CIDA, CUSO, and the World Bank; (3) projects for development - drawing on case studies and first-hand field work. Experienced advisors from government and the private sector join the instructor during project visits.

3315A Labour Economics, Lect. 3 hrs.; L. Osberg. *Prerequisites:* Economics 1100; Economics 2200 and 2201 (or equivalent) are recommended.

The theory of labour markets is emphasized, in particular the aftermath of alternative viewpoints which seek to explain relative wages, unemployment and the allocation of labour.

3316B * Collective Bargaining and Labour Market Policy, Lect. and seminar 3 hrs.; L. Osberg. *Prerequisite:* Economics 3315A.

Topics covered are the theory and institutions of collective bargaining and current issues in labour market policy, e.g. discrimination, manpower planning, wage/price controls, impact of unemployment insurance or the negative income tax.

3317B * Poverty and Inequality, Lect. and seminar 3 hrs.; L. Osberg. *Prerequisites:* Economics 1100; Economics 3315A is highly recommended.

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 theory underlying alternative measures and explanations of economic inequality are emphasized.

3321A/B Macro-Economic Theory, Lect. 3 hrs.; J. Cornwall. *Prerequisite:* Economics 2221A/B and Mathematics 110 (or equivalent).

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.

3322B * Inflation, Stagflation and Macroeconomic Policy, Lect. 3 hrs.; J. Cornwall. *Prerequisite:* Economics 2201 or 2221.

A consideration of different theories of inflation that have been developed to explain the acceleration of inflation in the past decade. Alternative policy solutions are appraised. Forms of incomes policy are taken up in some detail.

3324 Public Finance, Lectures and seminar 3 hrs.; J.F. Graham. *Prerequisites:* Introductory Economics, Economics 2200A/B or 2220A/B and 2201A/B or 2221A/B are desirable.

The principles of public finance and public policy, i.e. the economics of the public sector. The two major sections are (1) the theory of public goods and public expenditures and (2) the theory of public revenue, principally taxation. Other important areas are public borrowing, fiscal (stabilization) policy, and intergovernmental fiscal relations. Both normative and positive theory are considered. Particular attention is paid to the Canadian federal system, with its three levels of government: federal, provincial and municipal.

3326A Money and Banking, Lect. 3 hrs.; R.L. Comeau. *Prerequisite:* Introductory Economics; Economics 2221A/B is desirable (complemented by Economics 4426B.)

Deals with the nature and operation of the financial system, with particular reference to Canadian experience. It is concerned with financial instruments and institutions and the process of the social control of the supply of money and credit.

3327 * History of Economic Thought, Lect. 3 hrs; N.H. Morse. *Prerequisite:* Economics 1100. Classes in micro- and macro-economics are advised.

The approach taken is to study 'the intellectual efforts that men have made in order to understand economic phenomena'. The presentation is largely non-mathematical; the main requirement is an ability to read and assimilate a certain body of literature rather quickly.

3328 Industrial Organization, Lect. 2 hrs.; C. Marfels. *Prerequisites:* Economics 2200A/B or 2220A/B which may be taken concurrently. Students may also be admitted by permission of the instructor.

The application of the models of price theory to economic reality. In any industry, the problems of a firm competing with its rivals in order to survive and acquire a higher market share are far more complex than those in price-theory where we have to deal with more or less simplified assumtions. The three main parts are: market structure, market conduct and market performance.

3330A/B * International Trade, Lect. 3 hrs.; R.L. Mazany. *Prerequisites:* Introductory Economics and 2200A/B or 2220A/B.

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.

3332B Resource Economics, Lect. 3 hrs.; N.H. Morse. *Prerequisite:* Introductory Economics. Economics 2220A/B is also desirable.

This class focusses on economic theory pertaining to fisheries and the economic history of the Canadian Atlantic and Newfoundland fisheries since 1870. Reference is made to other resource sectors - agriculture, forestry, mining and energy - and students may undertake study of them.

3333A/B * Theories of Economic Development, Lect. 2 hrs.; Z.A. Konczacki. *Prerequisite:* Introductory Economics. A class in macro-economics equivalent to Economics 2201A/B or 2221A/B and Economics 3327 are desirable.

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.

3334A/B * Economic Development: Recent Debates, Controversies and Conflicts, Lect. 2 hrs.; Z.A. Konczacki. *Prerequisite:* Economics 1100. Economics 2201 or 2221 and Economics 3333A/B are desirable.

Whereas Economics 3333A deals with the more rigorously defined theories and models and their appraisal, this class focuses on the development policies and related controversies. Important examples of such controversies and conflicts, with far reaching developmental consequences, are provided. Attention is paid to the much debated environmental aspects of growth and development.

3336B Regional Development, Seminar 2 hrs.; and tutorials; R.I. McAllister. *Prerequisite:* Introductory Economics. At least one class in both Political Science and Canadian History are desirable.

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.

3338A Introductory Econometrics I, Lect. 3 hrs.; R.L. Mazany. *Prerequisites:* Mathematics 100 (or equivalent) and one of Economics 2228, Economics 2222A and 2223B or Mathematics 106A.

The theory of some quantitative methods commonly used by economists is introduced in the context of the classical linear model. Estimation problems caused by violations of the assumptions of the classical model are discussed including heteroskedasticity, autocorrelation and simultaneous equations basis.

3339B * Introductory Econometrics II, Lect. 3 hrs.; R.L. Mazany. *Prerequisite:* Economics 3338A.

Practical problems associated with economic data and with model specification and estimation are discussed. The techniques introduced in Introductory Econometrics I are used to estimate simple economic models. Some additional methods of estimation and forecasting are introduced.

3340B * Models of Communication and Transportation, Seminar 2 hrs.; P.B. Huber. *Prerequisites:* Economics 2220A/B and 2221A/B.

The influence of space and time as well as the interpersonal interaction involved in communication introduces modifications into micro-economic demand and supply models in these industries. In addition, regulation imposes constraints. Some of these issues are reviewed; if time permits, cost and benefit calculations in these industries are examined.

3341A/B * Urban Economics: Growth and Development of Urban Areas, Seminar 3 hrs.; T.A. Pinfold. *Prerequisite:* Intermediate Macro-economics is strongly recommended.

A study of the economic aspects of urban growth historically and in modern times. Cities are treated as macro-economic aggregates in the analysis. Participants deliver seminar papers and write one major analytical paper.

3342A/B * Urban Economics: Economics Analysis of Urban Problems, Seminar 3 hrs.; T.A. Pinfold. *Prerequisite:* Intermediate Micro-economics. Introductory Statistics is desirable.

The economic aspects of problems that emerge from the ongoing, dynamic functioning of life in urban areas. Urban problems are those related to land use within the city, with a highly inter-related character. The tools of micro-economics are used to study urban economic issues and problems. Participants prepare seminar papers and undertake a major analytical paper.

3350A/B * Social Cost Benefit Analysis, Seminar 3 hrs.; T.A. Pinfold. *Prerequisite:* Introductory Economics. Intermediate Micro-economics and Introductory Statistics are desirable.

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.

3432 * Regional Economics, Seminar 3 hrs.; F.M. Bradfield. *Prerequisite:* Economics 2220A/B.

Why economic growth tends to be differentiated regionally. A variety of growth theories are examined, followed by a discussion of empirical efforts and their assessment from the various theoretical points of view. Policy discussion and the presentation of seminar papers are involved. Some framework for understanding the reasons for the development of regional problems is provided. Focus is on the underdeveloped regions of developed nations.

4000 Seminar on Economic Policy: Public Policy in the 80's, 2 hrs.; E.W. Kierans.

The discussion centres on the problems of formulating and carrying out economic policy in Canada. Recent budget addresses; industrial policy and tax and expenditure policies are reviewed. Other topics include Canada's reliance on resource exports and capital imports; issues raised by multinational corporations and their consequences for political sovereignty. The choice of a balanced economy or export specialization is examined. The approach is interdisciplinary.

4400A Linear Models I, Lect. 3 hrs.; S. Dasgupta. *Prerequisites:* Intermediate Micro and/or Macroeconomics and a class in linear algebra are desirable. Admission by permission of instructor possible.

Exposition of aspects of economic theory from the standpoint of linear economic models. A brief systematic exposition of linear programming, followed by applications such as in: Theory of the Firm, Leontief Inter Industry Model, Transportation problems, International Trade, General Equilibrium Theory, Game Theory.

4409B * Linear Models II, Lect. 3 hrs.; S. Dasgupta. *Prerequisites:* Economics 4400A and a class in calculus are desirable. Admission by permission of instructor possible.

Introduction to dynamic models of economic growth and planning over time. Efficient programs of capital accumulation, growth with terminal objectives and balanced growth, optimal savings over time, theories of interest and capital, money, exhaustible resources and population are discussed.

4420A Micro-Economic Theory, Lect. 3 hrs.; E. Klein. *Prerequisite:* Economics 2220 or 2200. Mathematics 100 and 101 are desirable.

A basic but rigorous introduction to modern microeconomic theory. Deals in detail with the theory of choice as applied to consumers and firms, and discusses the working of an economy as a system of interdependent decision-makers. Emphasis is on the comparison of alternative solution concepts for competitive economies ending with an introduction to stability theory.

4426B * Monetary Policy, Lect. 3 hrs.; R.L. Comeau. *Prerequisite:* Economics 2221A/B. It is advantageous for students to have completed Economics 3326A as well.

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.

4431A/B * International Payments, Lect. 3 hrs.; A.M. Sinclair. *Prerequisite:* Economics 2201A/B or 2221A/B.

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.

4433B * Intergovernmental Fiscal Relations, Seminar 2 hrs.; J.F. Graham. *Prerequisite:* Principles of Economics. Economics 2200A/B or 2220A/B, and 3324 are recommended.

The principles of intergovernmental fiscal adjustment and their application in a federal political system, particularly Canada, at both federal-provincial and provincial-municipal levels.

4440 Applied Development Economics, Seminar 2 hrs. and tutorials; R.I. McAllister. *Prerequisites:* Economics 1100 and a basic class in statistics.

Following the outline of Economics 2250, but requiring a substantial background in economics, political science, history, sociology and commerce.

4446B Classical Liberalism, and Democracy (Seminar in Philosophy, Politics, and Economics), 2 hrs.; D. Braybrooke.

For description see Philosophy 447.

4447B The Theory of Games as an Approach to the Foundations of Ethics and Politics (Seminar in Philosophy, Politics and Economics), 2 hrs.; spring term, D. Braybrooke.

For description see Political Science 4485B.

4448A Social Choice Theory, (Seminar in Philosophy, Politics, and Economics), 2 hrs., D. Braybrooke.

For description see Political Science 4480A.

4449B The Logic of Questions, Policy Analysis, and Issue Processing, (Seminar in Philosophy, Politics, and Economics), 2 hrs.; D. Braybrooke.

For description see Philosophy 449.

Graduate Studies

The Department offers a graduate programme leading to the M.A. and Ph.D. degrees. Details of these programmes, including a list of graduate courses, are given in the Calendar of the Faculty of Graduate Studies. Senior undergraduates may be admitted to some graduate classes at the discretion of the instructors concerned.

Education

Chairman of Department
L.E. Haley, B.S.A., M.S.A. (Tor.), Ph.D. (California)

Professors
E.Z. Friedenberg, B.A. (Centenary), M.A. (Stanford), Ph.D. (Chic.)
W.F. Hare, B.A. (London), M.A. (Leics), Ph.D. (Tor.)
J.D. Myers, B.A., M.A. (Tor.), Ph.D. (Edinburgh) — *Dir. Part-time Studies and Extension*

Associate Professors
A. Barton, B.A., M.A. (Trinity)
R. Gamberg, B.A. (Brandeis), M.A. (Illinois)
P. Keane, B.A. (Manch.), M.Ed. (Bristol), Ph.D. (Bath)
T. Laidlaw, B.A., M.Ed. (Calgary), Ph.D. (Alta.)
J. Manos, B.A., B.Ed. (St.F.X.), M.Ed. (Calgary), Ph.D. (Alta.)
E.T. Marriott, B.A. (Mt.A.), M.Ed. (Tor.) — *Dean, Student Services*
H.J. Murphy, B.Sc. (St. Dunstan's), B.Ed. (P.E.I.), M.Ed. (Virginia), Ed.D. (Virginia)
H.E. Poole, B.A., M.A. P.G.C.E. (Birm.), Ph.D. (Tor.)
J.B. Roald, B.Ed. (U.B.C.), M.Ed. (Wash.), Ed.D. (U.B.C.)
S.W. Semple, B.A. (Syd.), M.Ed., Ed.D. (Tor.)
S.S. Sodhi, B.A., B.T., M.A. (Punjab), Dip. Guid. (Delhi), B.Ed., Ph.D. (Alta.)
K. Sullivan B.Sc. (Dal.), B.Ed. (Dal.), M.Ed. (Alta.), Ph.D. (Alta.)

Assistant Professors
R.N. Berard, B.A. (Antioch), M.A. (McM.), B.Ed. (Dal.), Ph.D. (McM.)
E. Ricker, B.A. (Tor.), M.Ed. (U.B.C.), Ph.D. (Tor.)
M. Shoeneberger, B.A. (St. Catherine), M.A. (Minnesota), Ph.D. (Alta.)
M.R. Welton, B.A., M.A., Ed.D. (U.B.C.)
B.A. Wood, B.A. (Tor.), M.Ed. (Ottawa), Ph.D. (Ottawa)

Lecturers
M. Crowley, B.A. (Miami), M.A.T. (Johns Hopkins)
A. Manicom, B.Ed. (McG.), M.Ed. (Atl. Inst. Educ.)
D.W. Russell, B.Pharm., Ph.D., D.Sc. (Lond.), B.Ed. (Dal.) (Dept. of Biochemistry)
M.St.J. Macdonald, B.Sc. (McGill), M.A. (St.F.X.), Ed.D. (Tor.)

Instructors

J. Altheim W. Kwak
M. Hutchings

The problems of education have been the subject of serious study since at least the time of Plato and Aristotle. Education is an important and interesting field of study in which historical, psychological, philosophical and sociological inquiries, among others, can be pursued. Many elect to take classes in Education because they are interested in the questions raised for their own sake. Others are interested in education as a programme of professional preparation. Such students include in the programmes classes in methodology and field experience. The study of education should alert the student teacher to the assumptions which lie behind the methods of teaching being considered, and should ensure that these assumptions do not go unchallenged.

Programmes:

1. A sequential secondary B.Ed. course of one year which may be taken by students who have already completed a B.A., B.Sc. or B.Com. degree course or otherwise fulfill the requirements for admission to the B.Ed. programme.

2. Part-time study toward a B.Ed. at the secondary level.

3. Classes which may be used for credit toward a B.A. or B.Sc. These classes may be chosen from the following areas: Sociology of Education, History of Education, Philosophy of Education, and Educational Psychology. Students intending to take education classes for credit toward a B.A. or B.Sc. degree should consult Arts and Science regulation 5.2.1.5. Some classes are cross-listed with other departments, e.g. French, German, Philosophy, so that a student who is not enrolled in a B.Ed. programme may register for such a class through the cognate department.

4. A four-year integrated course at the elementary or secondary level at the end of which students are awarded simultaneously the degrees of B.A. or B.Sc. and B.Ed.

5. Dalhousie–Nova Scotia Teachers' College Associateship B.Ed.

6. Dalhousie B.A./B.Sc.–Nova Scotia Teachers' College Associateship B.Ed.

Traditionally the programmes are divided into Elementary and Secondary. The divisions are much less distinct now, and this is reflected in the large number of options available in some courses.

The department encourages the development of experimental projects involving alternative courses to the traditional ones. Students interested in participating in such projects are invited to indicate this on the Departmental Application form and to discuss possibilities during their interview for admission.

B.Ed. Secondary Programmes

Entry Requirements
1. B.A., B.Sc., or B.Com. by September in the year of application. Candidates with other bachelor degrees should enquire from the Secretary, B.Ed. Programme.

2. Applications from all students are welcomed. Opportunity to draw attention to strengths is provided by the letter of application.

Application
Upon request, a student receives a Dalhousie University Application form, two reference forms, and further details from the Admissions Office, Dalhousie University, Halifax, Nova Scotia. Applications should be made by May 30. Since enrollment is limited there is no guarantee of admission after May 30, although applications wil be considered until August 15.

An interview is arranged with the Department of Education after initial application has been made. The date of interview must be confirmed by the applicant.

Selection is based on:
1. Academic record. All applicants, including Dalhousie graduates, must ensure that their transcripts are forwarded to the Admissions Office. (a) Candidates for the B.Ed. secondary programme normally should have a "B" average in their major subject, comprising at least five full credit classes (four beyond the 100 level). This major should be in a teachable subject: English, mathematics, geography, science, foreign languages (either in French, German or Spanish), or social studies (history, economics, political science, sociology, anthropology). (b) Individual methods/field experience professors may have more specific requirements for entry into their respective areas. Candidates should consult the Calendar (under Field Experience), the Programme Planning Guide or the professor. The programme must be planned and approved in consultation with the faculty advisor.

2. References; and

3. Responses on application form.

Those completing this process, and satisfactorily meeting the criteria established by the Department of Education of each of these stages, must attend a personal interview. Other arrangements are made for applicants from outside the Maritime Provinces. Only after the interview or its substitution is a decision made as to whether a student will be offered a place in the B.Ed. programme.

Classes in the B.Ed. programme are grouped into three general categories:

Educational Foundations - Classes to develop theoretical perspective as a basis for professional performance. There are four main subdivisions in this category - sociology of education, history of education, philosophy of education, and educational psychology. These classes are found in the calendar under course numbers 4000 to 4399.

Methods and Field Experience - Classes which deal essentially in an applied manner with teaching and learning and the evaluation of learning. These classes are found in the calendar under course numbers 4500 to 4999.

Electives - These classes provide supporting experience for other classes in Education, additional academic preparation, or an introduction to areas of potential student interest. Electives may be chosen from any course offered in the B.Ed. programme or classes in other departments of the Faculty of Arts and Science.

1. Secondary Programme Requirements

Candidates for the degree of B.Ed. (Secondary) must complete successfully the following: a minimum of *4 half-credit courses* covering all four Education Foundation areas - sociology, history, philosophy and educational psychology; *1 full credit* in a methods course in their major subject area; *1 full credit* in Education 4900 (Field Experience); *1 credit* in Special Education, as required by the Provincial Department of Education; and *2 further credits* from any area of the programme.

Students planning a B.Ed. following a B.A., B.Sc., or B.Com. should be aware that at present certain areas of concentration in the first degree might not easily lead to teacher certification. They are advised to consult with the Coordinator of the B.Ed. Programme when drawing up their programme for the first degree.

2. Part-time study toward a B.Ed.

Students registered part-time at Dalhousie University are permitted to take classes in Education leading to a B.Ed. degree, secondary. Individual timetables may be planned in consultation with the Department of Education, Dalhousie.

3. Education Foundation Classes

Acceptable for credit towards a B.A. or B.Sc. degree. Classes are numbered from 4000 to 4399. See Arts and Science regulation 5.2.1.5.

4. B.Ed. Elementary and Secondary Integrated (Four-year) Course

In the integrated course, the classes in education are integrated with academic classes in the second, third, and fourth years, the first year being confined to the regular classes required for the B.A. or B.Sc. degree or Kings' Foundation Year. Students may also enter the integrated programme after their second year.

The ten classes in Arts and Science taken in the second and subsequent years must meet the requirements set forth in Degree Programmes, section 5.2.1.

Education course requirements for elementary and secondary integrated students are the same as those required by sequential students. The year of study in which the various education classes are to be taken is up to the individual. An exception to this is the methods and field experience. The integrated student, both elementary and secondary, should plan third and/or fourth year classes in consultation with the Department of Education so that methods classes and field experience may be accommodated. It is advised that all integrated students meet with their Faculty Advisor early in their second year to plan a suitable programme. Twelve weeks of field experience may be required.

Students admitted into the integrated programme must maintain a minimum of a B-average in work completed for both degrees.

Enquiries should be made to the Secretary, B.Ed. Programme, Dalhousie University by May 30 of the student's first or second year at Dalhousie University.

Students wishing to obtain a B.Ed. and a B.A. or B.Sc. with honours should consult the Department of Education and the department or departments in which they wish to do their honours work not later than the beginning of their second year in order that a proper sequence of classes may be arranged. Five years from senior matriculation are normally sufficient to complete this course of study.

5. B.Ed. Degree in Association with Nova Scotia Teachers' College

1. *General Description*: The programme is available at Dalhousie University to graduates of the Nova Scotia Teachers' College who have completed the three-year Associateship at NSTC. Suitably qualified students may graduate after taking five further classes at Dalhousie. The programme is a fifteen-credit course, comprising six credits in education and nine credits in Arts and Science. A maximum of ten credits may be transferred from NSTC to the joint Dalhousie/NSTC B.Ed. degree, but they must meet Dalhousie's transfer credit regulations. It is available for full-time and part-time students.

2. *Prerequisites:* The applicant must have graduated from the three-year Associateship programme at the Nova Scotia Teachers' College.

3. *Programme: 15 required credits - 6 in Education*: (a) 5 maximum may be taken at NSTC and must meet Dalhousie transfer credit regulations; (b) 1 education class must be taken at Dalhousie; plus *9 in Arts and Science*: (a) 5 maximum may be taken at NSTC and must meet Dalhousie transfer regulations and *not* be in education; (b) 3 must be taken at Dalhousie in Arts and Science subjects other than education and at least 2 must be *above the first year level*; (c) 1 class, taken at Dalhousie, must be in consultation with the student's advisor (in the Department of Education).

6. Dalhousie B.A./B.Sc. and B.Ed. Degrees in Association with Nova Scotia Teachers' College

1. *General Description:* The programme is available at Dalhousie University to graduates of the Nova Scotia Teachers' College who have completed the three-year Associateship at NSTC. Suitably qualified candidates may transfer up to eleven credits from NSTC to Dalhousie. The programme is a twenty-two credit course, comprising seven credits in education and fifteen credits in Arts and Science. All credits transferred from NSTC must meet Dalhousie's transfer credit regulations. Students may complete the programme on a part-time or full-time basis thereafter.

2. *Prerequisites:* The applicant must have graduated from the three-year Associateship programme at the Nova Scotia Teachers' College.

3. *Programme:* 1. Twenty-two credits are required, seven in education and fifteen in Arts and Science. 2. 7 in education: (a) 5 maximum from NSTC; (b) 2 further from Dalhousie; plus 15 in Arts and Science: (a) 6 maximum from NSTC; (b) 9 further from Dalhousie. 3. A subject major must be chosen at registration and must be approved by the Department concerned. 4. Students must maintain a minimum of a B- average in work completed for both degrees.

Transfer of Credit

Decisions concerning transfer of credit will be made following consideration of transcripts and students' interested areas of study. Normally, 3-1/2 credits from another university or non-degree status will be considered for transfer credit. Enquiries should be directed to the Secretary, B.Ed. Programme.

Students who wish to obtain the degree of B.Ed. with transfer of previous credit must obtain the degree of B.A., B.Sc., or B.Com., and apply for admission to the B.Ed. programme. Graduates of non-degree granting Teachers' Colleges who have a B.A., B.Sc., or B.Com. should note that the following guidelines are used in transfer of Education credits: Graduates of an acceptable three-year programme take an additional two and one-half classes. Graduates of an acceptable two-year programme must take an additional three and one-half classes. Graduates of an acceptable one-year programme are required to take an additional five classes. The actual selection of classes is made to suit the needs of each student and you are advised accordingly when your file is examined. See also Regulations 1.5 and Admissions, Sec. 4 for further details.

Certification of Teachers
Licenses to teach are issued by the Department of Education, Province of Nova Scotia. According to the regulations of the Province of Nova Scotia, every applicant for a Teacher's license or Professional Certificate must submit with his application documentary evidence (in a form prescribed by the Minister of Education) respecting the applicant's moral character, age, health, training and qualifications. Further information may be obtained from the Registrar, Nova Scotia Department of Education. Graduates with senior matriculation are entitled to a Teacher's Certificate, Class 5 in Nova Scotia. All other B.Ed. Graduates should consult the Registrar, Nova Scotia Department of Education, concerning class of Teacher's Certificate. Students from other provinces should consult the appropriate provincial department of education for certification and licensing information.

Classes Offered

The following list represents this year's classes. Minor changes will be noted in the preregistration material sent to the students who are accepted into the programme.

Certain Education classes are offered in Summer School. Details may be obtained from the Director of Summer School and Extension.

4000 Sociology of Education, two lecture hours per week. Offered as two half classes: 4001A: first term (one-half credit), 4012B: second term (one-half credit)

Mainly theoretical, the accent is on the rationale and assumptions of educational systems, socialization in Canadian Society, and the positing of alternatives to traditional educational practices.

*** 4011A Family, State and Schooling**

This class begins with questioning the nature of our knowledge about schools to develop a way of thinking analytically about schools and schooling. Through readings and discussion, an attempt made to display sets of relations (both current and historical) that exist among the school, the family, the labour force and various state institutions, particularly as these relations produce and maintain inequalities of class, race, and gender.

4020 Gender Roles

Identification and analysis of problems deriving from sex roles form the core of this class. Emphasis is on female roles in contemporary Canadian society. The significance of factors which relate to an understanding of the subject is also considered. Attention is given to possible approaches to solutions of the problems already identified and analysed.

4030 Education, Ideology, and Revolutionary Change in China

Beginning with an examination of the factors leading to the 1949 revolution in China, economic, social, political and ideological developments to date are traced. Emphasis is on the Cultural Revolution of the 1960's and its impact. The major theme is the education of children both in and out of school, and the education and re-education of adults through a wide variety of means.

*** 4090 The Relationship Between Theory and Practice in Education**

*** 4101A/B The History of Western Educational Thought**

The history of educational ideas in the West. Through lectures and discussions of readings, the place of education in the ancient, mediaevel, early-modern, and modern worlds is examined. The development of our own educational ideas can then be subject to more sophisticated criticism.

4121A New Education in a Canadian Context

The New Education curricular changes, institutional experiments and philosophical goals that affected Canadian education at the turn of the century are explored. Foreign influences and forces in Canadian society that affected public schooling are examined. Students investigate primary source material at the Provincial Archives of Nova Scotia to determine the extent to which Nova Scotian curricular changes during this period (1890-1911) were affected by these trends. Arranged in a seminar-lecture form so that students' research can be guided each week, culminating with each student submitting a research paper.

4132B Progressive Education in a Canadian Context

Continuing many of the themes explored in the previous term (Education 4121A), significant institutional shifts of emphasis which occurred in Canadian public schooling after World War I are explored. American and British influences on the curriculum, as well as on the stated intentions of educators, are examined. Primary source material applying to Nova Scotia is investigated to determine if the Progressive Education movement had an effect on the schooling of children between 1911 and 1940. A seminar-lecture form is followed and a term paper is required.

4141A Educational Issues in Canadian History

An overview of major social and political issues in Canadian education. Selected case studies introduce the method of identifying and asking appropriate questions about the nature of issues and conflict. The historical antecedents of a number of major contemporary issues in education are explored in depth. A consideration of the "issue approach" to history in relation to various schools of historical thought about education is provided.

4142B Educational Issues in Canadian History

A continuation of 4141A but with a different selection of topics. A student is free to take the first half, second half, or both.

*** 4171A/B The Teacher in History**

Emphasis is on the connections between the historical experience of teachers and the contemporary situation in which teachers find themselves. The political characteristics of the education system are critically analysed and the development of the occupation of teaching, in comparison with other occupational groups, is examined. Particular topics related to the changing roles, attitudes and influences of teachers in terms of educational and social policy are discussed. A number of reading and writing assignments must be completed.

4201A/B Analytical Philosophy of Education

An introduction to the analysis of the central concepts in educational theory with particular attention to certain attitudinal concepts which have been neglected in contemporary philosophy of education.

*** 4221A/B Introduction to the Philosophy of Education**

4251A/B Philosophical Issues in Sex Education

A number of philosophical problems which arise in connection with sex education are considered. Both sex education and socialization are discussed and an attempt made to clarify central concepts.

*** 4290 The Adolescent**

4311A Psychology and Education of the "Exceptional" Child,

A broader understanding of the term "exceptional child" and the causes for such behaviour is provided. Psychodiagnostic and remedial processes to help children with communication behaviour problems are considered. Administrative use of standardized tests is discussed. Myths in Special Education are considered using Psycho-social Model of "exceptional behaviour".

*** 4312B Myths in Special Education**

Special education practices which attempt to help the "special child" "adjust" to the school as it presently exists are examined. Diagnostic approaches which lead to "suspicion confirming" and "pigeonholing" of the child are considered along with alternatives to special and remedial education.

4322R Learning in the Classroom

The psychology of learning, involving an examination of certain internal and external conditions which influence the direction and efficiency of the learning process. There is an orientation throughout to classroom learning; the focus of enquiry is fundamental psychological processes.

4335A/B Childhood into Adulthood

Psychological development from early childhood onwards from a cognitive perspective shows how adult identities are constructed by the individual by continual assessment and periodic revision of objectives.

4340 Developmental Psychology

An examination of the areas of human development with particular emphasis on cognition; personality, social and moral development. Theory and relevant experimental data to cultural contexts are related.

4351A/B Psychology for Sex Education

This class traces the psychological development of sexual interest and love. Special attention is paid to psychological factors in sex education.

4361A Understanding Reading

Psychological and linguistic factors relevant to the skills of fluent readers and to the process of learning to read are examined. An analysis of the reading process provides an understanding of what the skilled reader can do and how the beginning reader develops the skill. Reading instruction is discussed with the emphasis on "how a child learns".

4371A Social Psychology of Education

The psychological climate of the classroom is examined from a traditional, behavioural, and humanistic viewpoint. Emphasis is on the teacher-student relationship found in these three approaches to education and the resultant psychological effects on both the teachers and students.

4372B Social Psychology of Education

A framework for understanding the social interactions that go on within schools, and the effects these have on the participants used to the variations in teachers' and students' efforts to maintain self-esteem and respond to social roles. Evaluation consists of a project and a final examination.

*** 4381A/B Introduction to Counselling**

*** 4500 Media,** offered as either a half or full credit.

4540A The Nature of Scientific Knowledge

Since scientific knowledge is regarded as the most authoritative kind of knowledge, teachers, as the paid distributors of knowledge on behalf of the state, must understand clearly what the source and nature of scientific knowledge are, whether or not they are nominally science teachers. How scientific research is affected by its political and social context, and how the putative objectivity of scientific method invalidates many otherwise authoritative and informative ways of experiencing the world are examined. Evaluation is on the basis of one or two oral seminar reports on a topic illustrating the nature of scientific knowledge and its development; and a two-hour written examination during the last scheduled class meeting.

4552B Shaping Tomorrow's Science Curriculum

Against the background gained in the first half of the class, we examine in this second half the social, educational, and other pressures that determine the nature of prescribed curricula for school science. Problems of curricular change and implementation are studied, and current proposals for new approaches to science curriculum are examined. Particular attention is paid to the current Junior High School Science Curriculum in Nova Scotia, and to the Maritime Junior High School Science Curriculum Project as an example of modern curriculum planning.

4541A The Science Curriculum in A Social Context

Tomorrow's school science curriculum is being discovered in laboratories today. What is done, and its philosophical and social significance, are addressed through reading and discussion, to foster a deeper understanding of what it means to be a teacher of science.

4560 Geography in Education

An introduction to the structure of geography and contributions to geographical thought. The class is intensive, closely integrated, and with opportunities for practical work. Rural field trips are held on two weekends in the fall and involve absence from Halifax over two nights. Local field trips are also conducted from the campus at various times during the academic year.

4620 Theatre 4220 Developmental Drama

For class description see entry in the Theatre section of this calendar.

4633B Computers and the Curriculum

This class concentrates on the role of microcomputers in the school. Emphasis is on curriculuar implications arising from the presence of computers in the classroom and on evaluating existing computer courseware. Students also receive an introduction to at least one computer language.

4642B Principles of Outdoor Education, A. Richards.

For class description see entry in the Physical Education section of this calendar.

4700A Introduction to the Theory and Practice of Teaching, (required for students in a *three-year Integrated Elementary* B.Ed. Programme).

The major theory/practice issues and concerns in elementary education are introduced through films, readings and observations in school. The school observations are done as a group, include discussions with teachers about their work, and serve to introduce a variety of classroom settings and ways of thinking about differences in classrooms, teachers and schools.

*** 4701A Psycho-Educational and Policy Decisions in "Special Education"**

*** 4721A Topics in the Teaching of Science**

4742B Reading Instruction, *Prerequisite:* Education 4361A is required.

This class clarifies the kinds of questions which serve as a basis for instructional decisions. Students investigate various applications of psycholinguistic theory and apply in a practical way the theoretical information presented in 4361A, examining instructional techniques that can be used in the classroom for developing students' fluency as readers and writers.

4750 Teaching English in Secondary Schools

Personal approaches to the teaching of English at the secondary school level are developed. Weekly classes involve those activities teachers probably encourage. A range of classroom procedures and teaching methods fosters an imaginative and critical approach to the demands of teaching English.

4760 Teaching Social Studies in Secondary Schools

Skills in curriculum planning and course organization are developed and a variety of teaching strategies are introduced. Reflection on the nature and purpose of each discipline in the social studies allows one to develop appropriate lessons. Evaluation is based on weekly papers and a mid-term exercise in the first term and a major curriculum planning project and a mid-term exercise in the second term.

4770 Teaching Geography in Secondary Schools, *Prerequisite:* An undergraduate class in Geography or Education 4560.

An exploration of the objectives of geographic study; the acquisition of skills and the development of concepts and appreciations. Emphasis is on competencies in classroom teaching, shifting to a concentration on aspects of curriculum planning and development as they relate to geography.

4780 Teaching Mathematics in Secondary Schools

The study of a variety of methods relating to the teaching of mathematics at the secondary level forms the framework for this class. Students must read about each technique, participate in discussions about these techniques and in many cases be able to observe classroom situations where each method is used. A strong emphasis is placed on exploring the curriculum changes occurring in Education. This includes the place of statistics, the computer, the calculator, problem solving, and geometry in a school curriculum. Evaluation is based on one major project, assignments done individually and in groups, class participation, and a final examination.

4802B Science: A Cross-Discipinary Approach

Science is usually taught as discrete subjects. This class seeks to integrate some current scientific concepts and technological practice along one particular dimension. It traces the ways in which major bioelements behave both inside and outside living organisms. Much of the emphasis is biochemical, but the treatment ranges over such topics as soils and fertilizers, digestion, and microbial activities. Instead of a lab component, students use their teaching expertise to devise curriculum mini-projects illustrating living/non-living relationships. Of particular interest to Junior High science teachers, the class appeals also to those who teach science at the Elementary and Senior High levels.

4841A/4842B Teaching French in Secondary Schools Open only to students who have demonstrated adequate competence in French language and culture (passing a French language proficiency exam is required). Students taking this class must consult the instructor.

A consideration of foundations of second language teaching which moves to a discussion of methodology, techniques, materials (including visual aids), and testing. Emphasis is on developing teaching strategies which enable students to use French as a tool for authentic self-expression, orally and in writing. Directed observation of experienced teachers and practice in the development of teaching skills are integral parts of the class. Evaluation is based upon class participation (micro-teaching, oral reports, contributions to discussions), written projects, lesson plans, and examinations.

4871A Further Educational Studies
4872B Further Educational Studies
4873C Further Educational Studies

Students may apply to instructors for permission to undertake either a specially designed readings course in a given area, or to undertake additional work in their first teaching method, for credit. *This may also be done with prior consent in writing from the instructor to the Coordinator, B.Ed. programme. The instructor thus assumes personal responsibility for supervising the work of a student enrolled in this half credit elective course.*

4881C Science as a Human Activity
4882C Teaching Science in Secondary Schools (4881C and 4882C are required of B.Ed. candidates in Science.)

Science is more than a collection of facts. It is a way in which human beings seek to understand, predict, and control the world around them. This class inquires into the nature of science — the different meanings that attach to the word "science" for different people, the significance of the terms (like *fact, hypothesis, theory, explanation, law*) which people use in connection with science, and the ways of reasoning about the world that scientists use. But science is more, too, than "natural philosophy." It is an institutionalized activity, a profession into which people enter only after a long period of initiation. It is a source of employment, a requisite for technological innovation, and a receptacle into which public and private money may pour or trickle. These aspects, too, will be examined.

4891A Additional Curriculum Projects
4892B Additional Curriculum Projects
4893C Additional Curriculum Projects

Students may apply to instructors for permission to undertake additional project work in the area of curriculum design, implementation, and evaluation, for credit. *This may be done with prior consent in writing from the instructor(s) to the Coordinator, B.Ed. Programme. The instructor(s) thus assumes personal responsibility for supervising the work of a student enrolled in this half credit elective course.*

4900 Field Experience

It is the primary objective of the field experiences to provide students with opportunities to analyze, compare, and participate in a variety of teacher-learning situations. Students who intend to apply for a Provincial Teachers' Certificate should plan to log the equivalent of 100 hours field experience. All arrangements for field experiences are made through the Field Development Office and Methods Class Instructor.

4901R Elementary Curriculum Study and Field Experience. (This class is restricted to Integrated Elementary B.Ed. students.)

Conducted partially in the Dalhousie Elementary School, and partially in monthly tutorial sessions. The skills of planning integrated curriculum units, linking provincial guidelines to teacher-planned curriculum and the teaching skills involved with small group work, types of questioning and the evaluation of children from a developmental perspective, are topics covered.

4910 Additional Field Experience

This one-half credit class is made available to the B.Ed. students as an elective which they may choose to supplement the basic requirement for field experience. These additional field experiences are acquired through a block of three weeks spent in the schools at the end of the academic year. *This class can only be taken with the permission of your major methods instructor and the B.Ed. committee.*

4912B Theme Study: Additional Field Experience in Dalhousie Elementary School,
Prerequisites: 4900R & 4742B or equivalent.

This half-credit class offers two opportunities to the student: 1) six weeks of increased field experience, bringing the total logged teaching time to eleven weeks which is closer to the twelve weeks required in many provinces in Canada; 2) guided supervision in the implementation of a theme developed with the faculty supervisor in advance and designed for the spring theme study at the Dalhousie Elementary School. The student also gains experience in team teaching as the theme may be team-taught by two students to one of the three groups in the School. Because this class overlaps with graduation in May, a letter from the B.Ed. Co-ordinator is written at the conclusion of the course in May indicating that all classes have been completed to fulfill the requirements for the B.Ed. elementary program and that licensing forms have been sent to the Department of Education so that the student's application for teaching positions will not be jeopardized. A teaching license would be issued by the Department of Education at the end of June. The student would graduate in October. The class mark is arrived at by the supervising professor in consultation with the co-operating teachers and after consideration of the student's teaching performance and written conclusions regarding the theme's implementation.

4931A or 4932B Measurement and Evaluation

A study of the writing objectives, teacher-made tests, standardized tests, random variation, basic statistical ideas, and the evils of testing.

*** 4961A Canadian Studies: Methods of Teaching**

4962B Canadian Studies in the Curriculum

English

Chairperson of Department
J.B. Stovel

Professors
J. Fraser, M.A. (Oxon.), Ph.D. (Minn.)
J. Gray, M.A. (Aberd.), M.A. (Oxon.), Ph.D. (Mont.), F.R.S.C., F.R.S.A., *McCulloch Professor*
A.E. Kennedy, B.A., M.A., (U.B.C.), Ph.D. (Edinburgh)
M.G. Parks, M.A. (Dal.), Ph.D. (Tor.)
M.M. Ross, O.C., B.A. (U.N.B.), M.A. (Tor.), Ph.D. (Corn.), D.Litt. (U.N.B.), LL.D. (St.Thom.), D.Litt. (Trent), F.R.S.C. - *Professor Emeritus*
R.J. Smith, B.A. (Natal), M.A. (Oxon.), Ph.D. (Natal)
S.E. Sprott, M.A., B.D. (Melb.), Ph.D. (Col.) *George Munro Professor of English Literature*
D.P. Varma, M.A. (Patna), Ph.D. (Leeds)

Associate Professors
J.R. Baxter, B.A., B.Ed., M.A., Ph.D. (Alta.)
S.A. Cowan, B.A. (Montana), M.A. (Yale)
R. MacG. Dawson, M.A. (Tor.), M.Litt. (Oxon.)
R.M. Huebert, B.A. (Sask.), M.A., Ph.D. (Pitt.)
M.A. Klug, B.A. (Minn.), M.A. (Kan. State), Ph.D. (Ill.)
S. Mendel, M.A. (Cantab.)
P. Monk, B.A. (Reading), M.A. (Carleton), Ph.D. (Queen's)
C.J. Myers, B.A. (Sask.), M.A., Ph.D. (Tor.)
J.B. Stovel, B.A. (Sir G. Wms.), M.A. (Cantab.), Ph.D. (Harv.)
R.R. Tetreault, B.A. (U.B.C.), M.A., Ph.D. (Corn.)
H.S. Whittier, B.A. (U.S. Naval Acad.), M.A. (New Hamp.), Ph.D. (Yale)

Assistant Professors
M.M. Furrow, B.A. (Dal.), M.A., M.Phil., Ph.D. (Yale)
B. Greenfield, B.A. (York), M.A. (McG.),
H.E. Morgan, B.A. (U.B.C.), M.A. (Wash.), B.Litt. (Oxon.), Ph.D. (Wash.)
M.I. Stone. B.A. (Guelph), M.A., M.Phil. (Wat.), Ph.D. (Tor.)
J.A. Wainwright, B.A. (Tor.), M.A., Ph.D. (Dal.)

Adjunct Professors
N.F. Budgey, M.A. (Glas.), D.Phil. (Marburg), D.Litt. (Geneva Coll.) — *Adjunct Associate Professor*
R.L. Raymond, B.S. (Yale), M.A. (Tor.) — *Adjunct Assistant Professor*

The study of English literature at Dalhousie is not just the study of the literature of England. Although largely concerned with the rich written heritage of the British Isles, it also includes the study of writing in Canada, the United States, parts of the English-speaking Commonwealth and, indeed, some European countries, in translation.

It ranges widely in time from early Anglo-Saxon works of the eighth century through thirteen centuries of changing ideas and language to the still-changing thoughts, feelings and expressions of our own time. The many forms that the written word may take - poetry, fiction, drama, essay, history - are read, not only for an understanding of the literary evolution that brings them to be what they are, but also for an understanding of that which is temporary and that which is more enduring.

The purpose of English studies at Dalhousie, briefly stated, is the enjoyment and understanding of the written word. Since the word is the principal link between the individual heart and mind and the rest of the world, such studies naturally touch upon philosophy, politics, religion, and the fine arts as well. At the same time, the student is required to think, and to use language with clarity, judgement and imagination.

In more detail, the goals of English studies are to perceive that reading is a source of pleasure, knowledge and wisdom, to sharpen the powers of discrimination between what is good and bad in literature and ideas, to gain some understanding of the process by which great writing is achieved and indeed to inspire students to their own best expression.

In the first year, English 100 is required of all students who wish to take further English classes. There are some twenty different sections ranging from historical surveys to more eclectic studies. To enable students to choose the one most suited to their inclinations and needs the English Department and the Dean of Freshmen's Office have an English 100 supplement which includes the aims and reading lists of each section.

Classes numbered from 200 to 234 are especially suited for those concentrating in English, studying it as a complement to their main area, or taking an elective, and classes beyond 250 are designed as studies of specialized areas for Honours students. Honours classes are open to General students with permission of the Chairman and the professor concerned. **A supplement describing Upper-year General and Honours classes in detail is available from the English Department.**

Degree Programme

B.A. Programme

The Department expects all of its students to consult with faculty advisers and to form coherent programmes of study; it strongly recommends that these programmes contain at least *six* classes in English beyond 100. Students in the B.A. programme must take from four to eight classes in English beyond 100.

(1) English majors must take at least one class from each of the following groups, unless they have departmental permission to use an honours class to meet a group requirement.

GROUP I: English 207, 209, 210, 212, 213, 217, 231, 232, 233, 234.

GROUP II: English 205, 206, 208, 215, 218, 219, 224, 229.

GROUP III: English 200, 201, 202, 203, 204, 214, 216, 220, 225, 226, 227, 228.

The purpose of the requirements stated above is to ensure some variety in each student's programme. The Department recommends that the student take at least one class that concentrates on poetry and one that concentrates on fiction, and at least one class from each of two different historical periods. There is, of course, more to a sound programme than variety. From the Department's offerings, students may approach the study of English literature in a number of different ways. They may choose programmes which offer a broad historical background, which focus on specific genres or which concentrate on specific historical periods such as the 19th or 20th century. There are numerous other possible combinations. In any case, students should give careful consideration to planning their programmes to meet their individual needs and interests, and should consult with their departmental advisor if they need help in doing so.

(2) The following programme of study is recommended for English majors intending to become teachers of English at the high-school level:

200 Advanced Composition, or 201 The English Language, or 202 History of the English Language

207 Canadian Literature

214 Shakespeare

228 The Short Poem in English, or 215 Romantic Poetry, or 210 Modern Poetry in English

220 English Drama, or 226 Tragedy, or 227 Comedy and Satire, or 232 Modern Drama

208 English Novel to 1900, or 209 Modern Fiction, or 212 British Literature of the 20th Century, or 213 American Literature of the 20th Century

At least one class chosen from the last three groups should involve a substantial amount of literature written prior to the 20th Century.

The student may also choose a maximum of two more classes in English.

(3) Classes numbered from 200 to 234 (excepting 201, 202, 206, 207, 218) are not accepted as preparation for Graduate Studies in English. Students who may desire to change to an Honours Programme or continue in Graduate Studies should arrange with their Advisor and with the Chairman of the Department to complete several Honours classes before graduating with a General B.A. It is possible to enter a two-year M.A. course on completion of a General B.A. degree, but only if the student has completed four or five Honours rather than General classes for the concentration and has attained at least a second-division average in them.

The B.A. with Honours in English (Major Programme)
The Honours course in English offers a systematic study of the major writers and trends from mediaeval times to our century. It is therefore of particular relevance to the student who is interested in detailed study of English as a basis of a liberal education, to the prospective high-school teacher of English who needs a comprehensive understanding of the subject, and to the student intending to proceed to the graduate study of English and to complete in one year the requirements for the M.A. degree.

Students intending to enter the Honours course in Year II must consult the Department in advance to plan their course and be formally enrolled. In the subsequent years, Honours students are encouraged to seek advice of the Department in choice of classes.

The Honours course consists of nine classes (in addition to English 0050) beyond English 100. At least one class must be taken from each of the following six sections:

Section A. English 252 (recommended for third year)
Section B. English 253; English 351
Section C. English 251; English 352
Section D. English 254; English 356
Section E. English 354; English 452; English 457
Section F. English 357; English 453; English 455

The student may choose the three remaining classes from those not already chosen in Sections B to F, or from Section G: English 201, 202, 206, 207, 218, 454.

English 0050 (Bibliography), a non-credit class which meets one hour per week, is required of all Honours students and is to be taken in the first year of the Honours course.

Honours students must meet the requirements for the General B.A. degree. They are advised to select a minor from one of the subjects listed under either Group A or Group B in the "Academic Programmes" section of the Calendar.

B.A. with Combined Honours

There are several *Combined Honours programmes:* English and French, English and German, English and History, English and Philosophy, English and Spanish, English and Theatre. Students interested in any of these combinations or any other that involves English and another subject should consult with the Departments concerned.

Classes Offered

100 Introduction to Literature, Lect. 3 hrs.; Members of the Department.

Since English 100 consists of sections taught by many different instructors, statements about its objectives and approach must be confined to generalizations. All instructors of English 100 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 fortnightly 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.

Classes for General Degree

Successful completion of English 100 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. Not all classes shown are taught every year.

(Tentative List)

200 Advanced Composition, Lect. 3 hrs.; P. Monk. *Prerequisite:* English 100.

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.

201 The English Language, Lect. 2 hrs.; M.M. Furrow.

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.

202 History of the English Language, Lect. 2 hrs.; R. MacG. Dawson.

An introduction to the historical development of the English language. The growth of our "word-hoard", the evolution of word meanings, the changing patterns of speech sounds, of word forms and of syntactic structures, the distinction of dialects and literary styles are studied through analysis of selected literary texts. English 201 and 202 are complementary classes.

203 Masterpieces of Western Literature, Lect. 3 hrs.; H. Whittier.

Intensive reading of selected major works from Western literature, is designed to broaden the student's outlook on literature and also to increase his familiarity with works that are not only stimulating in themselves but also comprise the basis for the development of English and other literatures.

204 The European Novel, Lect. 2 hrs.; S. Mendel.

An intensive study of about ten representative European novels of the last two hundred years. A considerable amount of attention is paid to the philosophical ideas which are an important feature in many of the novels studied.

205 Landmarks of English Literature, Lect. 3 hrs.; R.R. Tetreault

This class studies works by many of the most influential British authors from Chaucer to the present century. These landmarks provide some orientation in the literary landscape, and help to make students aware of the diversity available in literary studies. The class is aimed at, but not limited to, English majors.

206 American Literature of the Nineteenth Century, Lect. 2 hrs.; S.A. Cowan.

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. This class may be taken for Honours credit.

207 Canadian Literature, Lect. 2 hrs.; M.G. Parks.

This class is a selective survey of Canadian prose fiction and poetry from colonial times to the 1960's. It includes twelve prose works and selections from the following poets: Goldsmith, Howe, Crawford, Roberts, Carman, Lampman, D.C. Scott, Pratt, Smith, F.R. Scott, Klein, Birney, Layton, Page, and, if time permits, one or two of the younger poets.

208 The English Novel to 1900, Lect. 2 hrs.; H.E. Morgan.

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.

209 Twentieth-Century Fiction, Lect. 2 hrs.; R.J. Smith, J.A. Wainwright.

An introduction to the main thematic and technical trends in the modern novel. Each section has its own emphasis and choice of texts.

210 (Formerly 301) Modern Poetry in English, Lect. 2 hrs.; S.E. Sprott.

A study of modern poetry in English is based on the seminal poets Yeats, Stevens, Pound, Eliot, and Williams; then selected developments of poetry from the 1930's to the present are considered. For readers, beginning and more experienced, who wish to get their bearings in modern poetry.

212 British Literature of the Twentieth Century, Lect. 2 hrs.

A survey introduction to the past seventy-five years of British fiction, drama, and poetry.

213 American Literature of the Twentieth Century, Lect. 2 hrs.; B. Greenfield.

An introduction to poetry, fiction and drama by American poets and novelists of the Twentieth Century.

214 Shakespeare, Lect. 2 or 3 hrs., H. Whittier.

For students in the General course who wish to study selected plays by Shakespeare. The aim of the class is simply to discover what the plays are about.

215 Poetry of the Romantic Period, Lect. 2 hrs.; D.P. Varma.

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. Although devoted to the study of a period, the class begins with a general introduction to the reading of poetry.

216 The Gothic Novel, Lect. 2 hrs.; D.P. Varma.

A survey of the origins and development of *The Tale of Terror and Supernatural* during the later half of the eighteenth century and its various manifestations and influences in succeeding fiction. Not only the chief landmarks of gothic fiction will be charted, but the students also explore the various chambers of horror-literature.

217 African Literature/African Studies, Lect. 2 hrs.; R.J. Smith.

African Literature written in English. Novels, plays, and poems are discussed. The bulk of the material is by Southern African and West African writers. Works studied are mainly modern, and reflect the attitudes of various African cultures towards racism, colonialism, and African nationalism.

218 Mediaeval Literature, Lect. 2 hrs.; H.E. Morgan.

A study of selected mediaeval 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-mediaeval developments in saga and romance, concluding with a look at some post-mediaeval uses of the inherited matter in Tennyson, Morris, Lewis and Tolkien.

219 Chaucer and his Contemporaries, Lect. 2 hrs.; M.M. Furrow.

A selection from the genres of late mediaeval 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.

220 English Drama, Lect. 2 hrs.; R.M. Huebert.

An introduction to some of the major plays and playwrights in the history of English drama. Special emphasis is given to plays by such leading dramatists as Marlowe, Webster, Wycherley, Shaw, Pinter, and Stoppard. Some attention is paid to the principal changes in staging practices from the mediaeval 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.

224 Renaissance Poetry, Lect. 2 hrs.; J.R. Baxter.

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, Spenser, Shakespeare, Donne, Jonson, and Milton.

225 Epic, Romance, and Fantasy, Lect. 2 hrs.; P. Monk.

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 some literary epic spirit as manifest in modern works.

226 Tragedy, Lect. 2 hrs.; R.R. Tetreault.

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.

227 Comedy and Satire, Lect. 2 hrs.; J. Gray.

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.

228 Short Poems in English, Lect. 2 hrs.; A. Kennedy

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 hokku; lyric as song; spoken poetry; poetry in print; concrete poetry; and possibly other topics to suit the class.

229 Victorian Poetry, Lect. 2 hrs.; M.I. Stone.

The poetry of Tennyson, Browning and Arnold with some attention to works by Swinburne, the Rossettis, and Morris. The poetry is studied against the intellectual context of the Age, that is, the social and political, the religious and scientific, and the philosophical ideas current in Victorian England. Attention also focuses on the poets' concern with how best to speak to their audience, a concern which raises questions of poetic theory and form.

231 Modern American and Canadian Novels, Lect. 2 hrs.; M.A. Klug/members of the Department.

Six Canadian and six American novels are treated as related "pairs", with the instructors dividing their time equally between the two sections. Both sections and both instructors meet together to discuss each pair of novels, after the novels have been dealt with individually.

232 Modern Drama, Lect. 2 hrs.; R.M. Huebert.

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.

233 Science Fiction and Fantasy, Lect. 2 hrs.; S.A. Cowan.

Selected works of speculative fiction are read for pleasure and studied for understanding. The study emphasizes analysis and evaluation of the works as literature. Each student is responsible for self-disciplined study of the history of science fiction and may expect to be examined in detail on his knowledge. Non-majors are welcome.

234 The Short Story, Lect. 2 hrs., A. Kennedy.

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.

Classes for the Honours Degree

(Tentative List)

0050 Bibliography, Lect. 1 hr. (first term only); C.J. Myers.

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 himself in his own research. The class also includes instruction in the technical aspects of writing papers (planning, research methods, footnotes, bibliographies), and some discussion of the history of printing insofar as it relates to the establishment of texts, particularly older ones. The class includes the assignment of an exercise to be done in the library.

251 Sixteenth-Century Non-Dramatic Literature, Lect. 2 hrs.; M.G. Parks.

The poetry and prose of the English Renaissance from its beginnings up to the 1590's. The main writers studied are More, Sidney, Spenser, and Shakespeare. There is also some exploration of the work of a selection of other writers, such as Elyot, Hooker, Wyatt, Surrey, Daniel, Davies, Marlowe, Nashe. The literature studied is part of a culture very different from our own. Therefore some attempt is made to understand the two main traditions, the classical and the Christian, as they influence and even permeate the literature of the century. As the bulk of required reading in prose and verse is not great, there is time for some background reading and study.

252 Shakespeare and the Drama of His Time, Lect. 2 hrs.; J.R. Baxter.

About fifteen plays by Shakespeare, some by choice of the class, are read 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.

253 Old English, Lect. 3 hrs., R. MacG. Dawson.

An introduction to the Old English language (700-1100 A.D.), 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 archaelogy. 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.

254 Restoration and Eighteenth-Century Literature, Lect. 2 hrs.; J. Gray.

The emphasis is on three great satirical authors (Dryden, Pope, and Swift), on a study of Restoration drama and on major works of Samuel Johnson. Since the literature of the period is related closely to the men and manners of the age, some time is spent on the contemporary climate of opinion revealed in the works of a number of writers representative of literary, political, social, and philosophical points of view: Hobbes, Halifax, Pepys, Rochester, Butler, Addison and Steele, Mandeville and Shaftesbury.

351 Middle English, Lect. 2 hrs.; M.M. Furrow.

An introduction to the language and literature of England after the Norman Conquest and prior to the rise of the Tudors. The principal emphasis is upon Chaucer's poetry but other authors and other types of literature are also studied. Through their readings, students should gain some historical sense of the language, of the social milieu and of the late-mediaeval social tensions which contributed to the literature's brilliance.

352 Seventeenth-Century Non-Dramatic Literature, Lect. 2 hrs.; S.E. Sprott.

Literature of the seventeenth century, up to about the Restoration, is studied in selected poems by Donne, Jonson, Herbert, Herrick, Crashaw, Marvell, Vaughan, Traherne, Denham, and Waller, and in prose by such writers as Bacon, Donne, Burton, and Browne, and in compositions by Milton from both his left hand (*Areopagitica*) and his right (especially *Paradise Lost*).

354 Victorian Novel, Lect. 2 hrs., S. Mendel.

The novels of the period from Scott and Austen to Hardy are studied.

356 The Romantic Period, Lect. 2 hrs.; R. Tetreault.

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.

357 Modern Canadian Literature, Lect. 2 hrs., A. Wainwright, P. Monk.

A study of Canadian fiction and poetry since the Second World War with emphasis on the changing form and content of Canadian writing. Classes consist of lectures and discussion.

360C Old Norse, Lect. 1 hr.; H.E. Morgan. *Prerequisite:* One of English 218, 253, 351 or instructor's permission.

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.

452 Nineteenth-Century Prose and Thought, Lect. 2 hrs., C.J. Myers.

The study of representative non-fictional prose works of the nineteenth century, for their intrinsic merits, with the object of exploring the ideas of the period about politics, religion, education, art and society. Instruction is chiefly by means of lectures, but there are ample opportunities for class discussion, and each student presents one seminar paper.

453 Twentieth-Century English Literature, Lect. 2 hrs.; J. Fraser.

Primarily for honours students and for M.A. students in their make-up year. Each member of the seminar writes two papers to serve as starting-points for the class discussions. There are no examinations, but regular attendance is expected in the interests of effective debate.

454 Literary Criticism, Lect. 2 hrs.

A survey of Classical Greek and Latin theory, English criticism and some pertinent European writers and trends.

455 Modern American Literature, Lect. 2 hrs.; M.A. Klug, H.S. Whittier.

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.

457 Victorian Poetry, Lect. 2 hrs.; C.J. Myers.

The major poetry of Tennyson, Arnold, and Browning with some attention to the Pre-Raphaelite School. The poetry is studied within the intellectual context of the Age, that is, the social and political, the religious and scientific, and the philosophical ideas current in Victorian England.

Graduate Studies

The Department offers graduate classes leading to the degrees of M.A. and Ph.D. Details relating to admission, scholarships and fellowships, requirements for the degree, classes of instruction, etc., can be found in the Calendar of the Faculty of Graduate Studies.

French

Chairperson of Department
W.T. Gordon

Professors
H.F. Aikens, B.A. (Dal.), A.M. (Yale)
R. Kocourek, State Examination, Ph.D., C.Sc., Docent (Prague) *(Graduate Coordinator)*
D.W. Lawrence, B.A., M.A., Ph.D. (Lond.)

Associate Professors
M. Bishop, B.A., B.Ed. (Manch.), M.A. (Man.), Ph.D. (Kent, Canterbury)
J.W. Brown, A.B. (Miami), M.A. (Middlebury), Ph.D. (Penn.)
B.E. Gesner, B.A. (Kings), B.Ed., M.A. (Dal.), Dr. de 3e cycle (Toulouse, 2)
W.T. Gordon, B.A., M.A., Ph.D. (Tor.)
H.R. Runte, M.A., M.Ph., Ph.D. (Kansas)
M. Sandhu, Licence ès Lettres (Montpellier), Ph.D. (Yale)
K. Waterson, B.A. (Long Island), M.A. (N.Y.U.), Ph.D. (C.U.N.Y.)

Assistant Professors
E. Boyd, B.A. (S.M.U.), B.Ed. (St.F.X.), M.A. (Middlebury)
P. DeMeo, B.A., M.A., Ph.D. (U.C.L.A.)
N. Trèves-Gold, B.Sc. (Amer. U., Cairo), Ph.D. (Rice)

Adjunct Professor
R. Runte, B.A. (S.U.N.Y.), M.A., M.Ph., Ph.D. (Kansas)

The Department of French offers students not only the opportunity to develop fluency in classes backed up by excellent laboratory facilities, but also the possibility of studying the literature and culture of France, French Canada and the other nations of the French-speaking world, and the linguistic structure and development of French.

Classes are available for beginners and for those with a background in the language who wish to improve and maintain any or all of the following skills: speaking, listening, reading, and writing. Other classes are specially designed for students who are interested in teaching, translation, or other areas of language study. The role of French in Canada and in the Maritimes is stressed in classes in Acadian and Québecois literature and civilization. The literature of France and French-speaking nations is brought to life in classes organized around a theme, a genre, or a historical period.

The Department of French urges students to practise the language as much as possible. The *Maisons françaises* are three houses on campus in which students may live with native speakers in a francophone environment. The French Club organizes many 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. Each year the Department offers at least one course off campus in a francophone environment. In the past we have offered an intensified version of French 3000B in Mayenne, France and in Saint-Pierre and Miquelon. Please consult the Department for information concerning schedule and bursaries available.

A B.A. 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 B.A. 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 and an M.A. or M.A.T. degree may be pursued in the Department (see the Calendar for Faculty of Graduate Studies).

Major or honours students may, with the approval of the Department of French, take up to one year (5 full credits) of work at a Univeristy in a francophone environment and receive credit at Dalhousie.

Degree Programmes

B.A. Programme

Students should consult the Chairman or a Department Adviser about their choice of classes. The Department expects students majoring in French to form coherent programmes of four to eight full classes or equivalents beyond 1020R or 1000R/2000R. These programmes might be in one of these streams, for example: General, Language and Linguistics, Literature, Civilization, French-Canadian Studies. Students should note that:

(1) a) All majors are normally required to take at least one full credit from 2021A/2022B and 2041A/2042B.

b) All majors are encouraged to take one or more full credits in their second year from: 2110A/2111B, 2201A/2202B or 2030A/2030B.

c) All majors are required to have a counselling session at the end of their second year (or before classes begin in the Fall of their third year). If advised at that time, they may be required to take 3041A/3042B.

d) All majors are normally required to take one 3000-level class other than 3040A/3041B and are encouraged to take more than one class on this level.

(2) There is no bar to changing to an Honours Programme after the second year of studies. Students wishing to do so, or to continue in Graduate Studies, should consult the Chairman or the Honours Adviser.

B.A. with Honours in French

This programme offers systematic, comprehensive and individualized study of French language and/or literature both within and without the classroom. It is, therefore, an option which should be considered seriously by any student who, with career or personal objectives in mind, wishes to obtain a strong background in French and by those who plan to teach or earn a graduate degree in French.

Honours students are strongly encouraged to enrich their more traditional learning experience by living in one of the *Maisons Françaises* and by spending at least one summer in a French-speaking area. Majors or honours students may, with the approval of the Department, take up to one year (five full credits) of work at a university in a francophone environment and receive credit at Dalhousie. Please consult department for information on programmes available.

Financial support may be available. Please consult the Chairman of the Department.

Students intending to enter the Honours programme should consult the Honours Adviser to discuss their programme as early as possible. It is recommended that eleven classes be taken beyond the first year level. Normally no more than three credits at the 2000-level and no more than five credits at the 3000-level may be included. The following outline is offered *as a guide*.

1st year: French 1020R or 1000R and 2000R (either 1000R or 1020R might be combined with 1060R).
2nd year: Three credits chosen primarily from: 2201A/2202B, 2041A/2042B, and 2030A or 2031B, plus other 2000-level classes.
3rd year: the equivalent of 4 full credits chosen from French 3000B, 3020R, 3041A/3042B, 3100R, 3200A/B, 3300A/B, 3400A/B, 3500A/B, 3600A/B,-3700A/B, 3800A/B, 3900A, 3901B, 3910A.
4th year: the equivalent of 4 full credits chosen from French 4001A/B, 4002A/B, 4010A, 4011B, 4015R, 4041A, 4042B, 4300A/B, 4301A/B, 4400A/B, 4401A/B, 4500A/B, 4501A/B, 4600A/4601B, 4700A/4701B, 4710A/B, 4800A/B, 4801A/B, 4811A/B; a research paper or a comprehensive exam.

1000R: Français pour débutants/Beginners French, Lect. 3 hrs.; Language lab. 3-6 hrs., according to individual need.

This class, intended for students with little or no previous instruction in French, covers a sufficient range of basic linguistic structures and high-frequency vocabulary to enable students to engage in simple, everyday communication on a variety of subjects. Classes are conducted in French as much as possible with a view to developing competence in "real-life" communication, both oral and written. Work done in the three class meetings per week is supplemented with both oral and written exercises in the Dalhousie Learning Laboratory and with reading assignments, compositions, and written exercises to be completed outside of class. Students are also introduced to significant aspects of French, French-Canadian, and other francophone cultures. Upon completion of French 1000, students wishing to complete the study of basic French language structures and to increase their written and spoken fluency should enroll in French 2000.

1020R Révision de français oral et écrit/Spoken and Written French in Review, Lect. 3 hrs.; Language lab. 1-2 hrs., according to need.

This is the usual first-year class for those students who have studied French throughout high school. Designed to develop proficiency in speaking and listening skills, as well as in reading and writing. Classes are taught in French and involve much oral practice: discussions, exercises, etc. are based on a variety of reading and listening materials. Short written exercises and occasional compositions reinforce this work. The basic structures of French are reviewed. Listening comprehension assignments are done in the Learning Laboratory in the Killam Library. Agreement of adjectives, placement of object pronouns, etc. is assumed, since these and other items are dealt with as review items. Students with little or no acquaintance with such structures should take French 1000.

1060R Pratique de la lecture/French for reading, Lect. 3 hrs.

Development of the ability to read contemporary French prose with ease and accuracy. Emphasis is on the acquisition of skills to 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). French 1060 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.

Note: *All classes above this level are normally given in French.*

2000R Français pour débutants: Niveau II/Beginners French: Level II, Lect. 3 hrs., Language lab. 3-6 hrs., according to individual need. No student may enroll in French 2000 without having first completed French 1000.

This class contineus the work begin in French 1000, focusing on more advanced forms of

expression including the vocabulary, verb forms, and syntactic structures necessary for communication at a relatively high level of abstraction and complexity. As in French 1000, all classes are conducted as much as possible in French, with additional practice provided through the Dalhousie Learning Laboratory and through regular reading and writing assignments. Reading selections drawn from the press and the literature of French-speaking cultures continue to be a regular part of the work, in the interest of deepening and enriching the students' understanding of the people whose language they are studying. (Credit awarded for French 2000 may not be counted towards a major in French.)

2021A/2022B Etudes pratiques/Practice in Language Skills, Lect. 3 hrs.

Follows 1020 or 1000/2000. It is normally taken in the second year of study and provides the opportunity to practice and improve language skills already acquired. Sections approach language learning through different subjects (such as Acadian studies, African and Caribbean civilization, cinema, journalism, the occult, or the detective novel). All classes and assignments are entirely in French. Students must choose sections with different topics to earn credit for both A and B. However, it is not necessary to take both A and B and students may elect to study one semester only. Students should consult the current timetable, as the topics offered change each year.

2023A/2024B Etudes pratiques II/Practice in Language Skills II, Lect. 3 hrs. For non-majors only. Permission of coordinator of French 2021 required. Open only to students having completed French 2021A/2022B.

These classes provide the opportunity for further practice and improvement of language skills already acquired. As in 2020A/2021B, sections approach language learning through subject areas such as French Art, Technical and Commercial Vocabulary, Women in France and French Canada, etc. All classes and assignments are entirely in French. Students must choose sections with different topics to earn credit for A and B. The topics chosen for 2022A/2023B must also be different from those taken in 2020A/2021B and the topics chosen for 2024A/2025B must differ from those of *all* previous classes. It is not necessary to take both A and B and students may elect to study one semester only. Students should consult the current timetable, as the topics offered change each year.

2025A/2026B Etudes pratiques III/Practice in Language Skills III, Lect. 3 hrs. For non-majors only. Permission of coordinator of French 2021 required. Open only to students having completed 2023A/2024B.

32030A/2030B De l'orthophonie à l'intonation expressive/From Corrective Phonetics to Expressive Intonation, Lect. 3 hrs., Language lab, according to need. *Prerequisite:* French 1020 or equivalent.

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 develop self-expression and audio comprehension.

2031A/2031B Interprétation/Simultaneous Translation, Lect. 3 hrs. in language laboratory, supplementary lab. hrs., as necessary for individuals.

Practical introduction, given in the language lab., to oral English-French and French-English translating (interpreting) with emphasis on fluency, vocabulary building and comparative syntactico-stylistic analysis.

2041A/2042B Introduction à la stylistique du français/Introductory Composition, Lect. 3 hrs.

These classes constitute a detailed and comprehensive review of grammar by means of various exercises including dictations, translations, compositions and summaries. They involve a study of written style and manner of expression.

2110A/2111B Civilisation du Canada français/Civilization of French Canada, Lect. 3 hrs.

The first part concentrates on the major historical and political trends and events of French-Canadian society in recent years. An attempt is made to understand the problems facing the francophone minorities across the country, as well as those encountered by the Québecois of today. The second half examines French Canada in the light of its cultural output - such as music, theatre, painting, poetry, cinema, etc. These cultural aspects are studied not as aesthetic works but rather as artistic expressions of a particular society.

2201A/2202B Introduction à la littérature/Introduction to French Literature, Lect. 3 hrs.

A survey of literature in French from the Middle Ages to the 20th century, presenting selected works of prose, poetry and theatre from France, Québec, Acadia and other francophone countries. 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. French 2200A and 2201B may be taken consecutively. Classes involve, principally, group discussion, often based upon short individual presentations.

3000B Cours supérieur de français oral/Advanced Oral French Workshop, Lect. 3 hrs.

Class discussions and oral presentations based on themes of contemporary concern. This class may be offered off campus in France 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 often necessary for the oral presentations.

3010R Phonétique/Phonetics, Lect. 3 hrs. *Prerequisite:* familiarity with the spoken forms of English and at least one other language.

An introduction to the study of the sounds of language, with special reference to English and French: how these sounds are perceived and produced, their classification, practice in the use of phonetic symbols, basic phonemic theory (information on French pronunciation, but not primarily a class in remedial pronunciation).

3020R Linguistique/Linguistics, Lect. 3 hrs.

Characteristic features of the French language are examined against a general linguistic background. The topics belong to the areas of pronunciation, spelling, word formation and meaning, word inflexion, sentence structure and text analysis. These questions are presented in various ways: in the form of lectures, exercises, assignments, class reports and discussions of articles selected by the students. Emphasis is on the relation between language structure and its special uses in self-expression, communication, bilingual contact, translation, language teaching, social diversification and unification, cognition, literature. (A possible continuation of this class is 4010A or 4011B.)

3025A/3025B Les parlers Acadiens: Introduction linguisitque/Linguistic Introduction to Acadian Dialectology. Students wishing to take the course must have taken, be concurrently enrolled in French 3020R, or must seek the permission of the instructor.

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.

3041A/3042B Etudes pratiques de stylistique I/Intermediate Composition, Lect. 3 hrs.

These classes develop further the skills acquired in 2040/2041B. Through a variety of exercises, students are taught to express themselves in clear, accurate, idiomatic French, and to perform a number of tasks of a practical nature: writing reports, summaries, letters, etc. A good knowledge of grammar is essential.

3081A/3082B Didactique du français langue seconde à l'école secondaire/Methods of Teaching French at the Secondary Level, Lect. 3 hrs. Open only to students who have demonstrated adequate competence in French language and culture (passing a French language proficiency exam is required). Students taking this class are normally completing a B.Ed. Other students interested must consult the instructor.

A consideration of foundations of second language teaching which moves to a discussion of methodology, techniques, materials (including visual aids), and testing. Emphasis is on developing teaching strategies which enable students to use French as a tool for authentic self-expression, orally and in writing. Directed observation of experienced teachers and practice in the development of teaching skills are integral parts of the class. Evaluation is based upon class participation (microteaching, oral reports, contributions to discussions), written projects, lesson plans, and examinations.

3085B Didactique du français langue seconde à l'école élémentaire et en immersion/Methods of Teaching French in the Elementary School and Immersion. *Prerequisite:* Students must have enrolled in or actively audited French 3081A.

This class focuses on specific methods and materials appropriate for the elementary-age child in the French core program and/or immersion.

3100R Civilisation de la France et du Canada français/Civilization of France and French Canada, Lect. 3 hrs.

An attempt, through talks, reading and discussion, to understand and to suggest fruitful ways of studying, from an English-speaking Canadian point of view, what is essential in French and French-Canadian culture and outlook.

3200A/3200B Appréciation de la littérature/Literary Appreciation, Lect. 3 hrs.

An approach to the critical reading of various periods of French literature. The class offers discussion of representative works of major writers, centering either on genre, theme, or period and involving close textual analysis. It also includes some discussion of past and current theories of literature. See department for specific details in any given year.

3300A/3300B La littérature médiévale/Mediaeval French Literature, Lect. 3 hrs.

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.

3400A La littérature du seizième siècle/16th-Century French Literature, Lect. 3 hrs.

Reliving the awakening, bloom and decline of the Renaissance period in literature and language through the works of Marot, Rabelais, DuBellay, 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.

3500A/3500B La littérature du dix-septième siècle/17th-Century French Literature, Lect. 3 hrs.

The theatre in 17th-century France: an examination of representative works by Corneille, Racine and Molière; an attempt to define these dramatists' vision of man and the world and to assess their contribution to the history of ideas and the development of French theatre.

3600A La littérature du dix-huitième siècle/18th-Century French Literature, Lect. 3 hrs.

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).

3700A/3700B La littérature du dix-neuvième siècle/19th Century French Literature, Lect. 3 hrs.

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.

3800A La littérature du vingtième siècle/20th Century French Literature, Lect. 3 hrs.

Poetry and Theatre, 1900-1984. 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 and Ionesco.

3900A/3901B La littérature canadienne française/French-Canadian Literature, Lect. 3 hrs.

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., 3900A Poetry, 3901B Novel) and choice of genre may differ from year to year.

3910A/3910B Etudes acadiennes/Acadian Studies, Lect. 3 hrs.

Critical investigation into the historical, socio-cultural, linguistic and literary significance of past and present Acadian writing. May follow Acadian Studies (2020A/2021B).

4001A/4002B Histoire de la langue française/History of the French Language, Lect. 3 hrs.

4001A *Histoire du français - Moyen Age/History of French - The Middle Ages:* Advanced research into selected topics in Old and Middle French - manuscript studies; paliography; historical phonetics, morphology and syntax; the cultural-literary context of linguistic development; etc.

4002B *Histoire du français - Epoque 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 (Rhétoriqueurs, the Baroque, Préciosité, the Revolution, scientific French, argot), etc.

4010A Evolution de la linguistique moderne/Evolution of Modern Linguistics, Lect. 3 hrs.

French texts by great linguists of the 20th century are seen in their historical and contemporary perspectives. Lectures and supervised reading alternate with discussions and reports.

4011B Lexicologie/Lexicology, Lect. 3 hrs.

Monday lectures deal with French word formation and meaning, major French dictionaries, and contemporary contributions to French lexicology. Wednesday classes look at lexical assignments and questions of current interest in Canada. The Friday class is set apart for discussions of reports on topics chosen by the students.

4015R Cours supérieur de version/Advanced Translation into English, Lect. 3 hrs.

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.

4041A/4042B Cours avancé de stylistique littéraire/Advanced Composition, Lect. 3 hrs.

These classes present an in-depth study of style. The class has as a goal to teach students to express themselves with elegance and refinement.

4300A/4301B Le roman et la poésie courtois/Courtly Novels and Poetry, Lect. 3 hrs.

A) *Le Roman courtois/The Courtly Novel:* A close literary analysis of mediaeval French Arthurian romances. Texts in bilingual (Old French/French) editions.

B) *La Poésie courtoise/Courtly Poetry:* A stylistic and socio-cultural study of French courtly love poetry from the 9th to the 15th centuries. Early texts in modern French translations.

4400A/4400B Poésie de la renaissance: Théorie et pratique/Renaissance Poetry: Theory and Practice, Lect. 3 hrs.

A seminar-style study of poetic theories and practices from the *Rhétoriqueurs* to the *Pléiade* and to Malherbe. French 3400 recommended.

4401A/4401B La pensée philosophique, politique et morale de la renaissance/Philosophical, Political and Moral Thought of the Renaissance, Lect. 3 hrs.

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*.

4500A/4501B L'aventure intellectuelle du grand siècle/The Intellectual Adventure of French Classicism, Lect. 3 hrs.

The focus of these classes, which examine, at an advanced level, a major figure, movement, genre or theme in 17th-century French literature, will vary frequently. Please consult the professor for detailed information on the topic to be treated in any given semester.

4600A/4601B Le siècle des lumières: forme et philosophie/The Enlightenment: Form and Philosophy, Lect. 3 hrs.

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.

4700A/4701B Du romantisme au réalisme/From Romanticism to Realism, Lect. 3 hrs.

4700A *La révolution romantique/The Romantic Revolution:* Romanticism is viewed primarily as a rebellious and creative force which greatly contributed to reshape 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.

4701B *Le roman/The 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 and regular reports and exposés.

4710A/4710B Du symbolisme au surréalisme/From Symbolism to Surrealism, Lect. 3 hrs.

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.

4800A/4801B Le théâtre et le roman modernes/Modern Theatre and Novel, Lect. 3 hrs.

4800A *Le théâtre de Camus et de Claudel/The Theatre of Camus and Claudel:* In all, eight plays are studied, four from each author. The works offer a contrast in philosophical content and reveal technical problems involved in their stage presentation.

4801B *Le nouveau Roman/Anti-novels of the 20th Century:* In this class we are mainly interested in fictional techniques: how the author creates his illusion. Each of the works selected for detailed study is important due to the author's rejection of conventional ideas regarding the form of the novel.

4811A/4811B La poésie francophone de Perse et Char à Senghor et Césaire/Francophone Poetry from Perse and Char to Senghor and Césaire, Lect. 3 hrs.

Discussion of the works of five or six major francophone poets of the modern period, chosen from: Perse, Reverdy, Claudel, Char, Frénaud, Senghor, Tchicaya, Césaire, Glissant, Miron and others.

4994A/4995B; 4996A/4997B, 4998A/4999B Recherches indépendantes/Independent Research

May only be taken with the approval of the Chairman as well as that of the faculty member concerned.

Graduate Level Courses

Classes in the 5000 series are for graduate students who, for more detailed information, should consult the Graduate Calendar and arrange to meet the Graduate Co-ordinator. Special seminars and graduate colloquia are arranged each semester. Students may obtain current information as to topics, dates, and places, in the Departmental office.

Geology

Chairperson of Department D.B. Clarke
Undergraduate Adviser G.C. Milligan
Graduate Adviser P.J.C. Ryall

Professors
D.B. Clarke, B.Sc., M.A. (Tor.), Ph.D. (Edin.)
J.M. Hall, B.Sc. (Wales), Ph.D., D.I.C. (Lond.)
G.C. Milligan, M.Sc. (Dal.), Ph.D. (Harv.), *Carnegie Professor*
P.T. Robinson, B.Sc., (Mich.), Ph.D. (Calif.)
P.E. Schenk, B.Sc. (W.Ont.), M.Sc., Ph.D. (Wisc.)

Adjunct Professor
P. Hacquebard, Ph.D. (Groningen)

Associate Professors
F. Medioli, Ph.D. (Parma)
G.K. Muecke, B.Sc., M.Sc. (Alta.), D.Phil. (Oxon.)
P.H. Reynolds, B.Sc. (Tor.), Ph.D. (U.B.C.), (jointly with Physics)
M. Zentilli, B.Sc. (Chile), Ph.D. (Queen's)

Assistant Professors
R. Boyd, B.Sc., Ph.D. (Sydney)
R.A. Jamieson, B.Sc. (Dal.), Ph.D. (M.U.N.)
M.R. Gibling, B.A. (Oxon.), Ph.D. (Ottawa)
P.J.C. Ryall, B.Sc. (Dal.), M.Sc. (Alta.), Ph.D. (Dal.)

Instructor
P. Wallace, B.Sc., M.Sc. (McM.)

Research Associate
C. Beaumont (Major appointment in Oceanography Department)

NSERC Research Fellow
D.B. Scott, B.Sc. (Wash.), Ph.D. (Dal.)

Geology is for those who wonder about the earth. How was it made? What changes it now? Where do we seek oil? Or nickel? What moves continents? Its study is of enormous economic importance to Canada - and of course to the world as a whole -and is intellectually exciting.

The Halifax-Dartmouth region is one of the best places in Canada in which to study the earth. The departments of geology, oceanography, and physics at Dalhousie are all involved as are several government agencies in the region.

Classes in geology 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. Some may need instruction in geology as an aid to other disciplines; for example, a mining engineer; or a physicist interested in X-ray diffraction spectrometry; or a chemist interested in crystallography; or a biologist interested in protozoa. Students may be interested in a geology 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 the introductory class in geology stimulates their awareness of their surroundings, and their appreciation of the many facets of science.

Careers open to geologists are many and varied. The largest number of job opportunities is provided by industry, primarily in the search for the production of raw materials. Geologists competent in mathematics might be involved in processing and analysing data using digital computers; those interested in going to sea might work with marine institutions. The federal and provincial governments also employ geologists.

High School Preparation
Students in high schools who plan a *career* in sciences involving the earth, such as geology or geophysics, should note that it is sensible to try to have the following subjects in Grades XI and XII: Grade XII mathematics, plus two of Chemistry, Physics and Biology. (The third should have been taken in Grade XI if possible). Note that these are *not* prerequisites, but are strongly advised. The student should aim to make up deficiencies in high school preparation in the first year at Dalhousie. Note too that at present Grade XII Geology is *not* counted as equivalent to a 100-level class in Geology at Dalhousie.

UNDERGRADUATE PROGRAMMES

(1) Programmes and classes for those whose major is not geology
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 frame in the development of transportation; a biology student whose fauna and flora inhabit the mud of the sea floor. These classes are:
(i) Geology 104A/105B, especially designed for students in the humanities and social sciences. (ii) There is one evening class, 241B, open to all with 100, or good grades in 104A. This particular class is not normally suitable for students whose major is geology. (iii) For engineering students and science students in other disciplines: Biologists: 100, 241B, 436A, 437B; Chemists: 100, 210, 301A, 302B, 439B; Physicists and mathematicians: 100, 205B, 313B, 427A, 428B, and 429B.

(2) General Degree Programme
Three-year programmes with a major in Geology are suitable for students who intend to take further professional training or to enter fields where they are likely to need their geological training as background, but are of little value as a qualification for a professional career in the earth sciences.

One programme recommended for students undertaking a general B.Sc. with a major in Geology is the first three years of the concentrated honours programme (see the table under (3) below). This programme may not be suitable for all students, and others can be arranged. All students intending to major in geology are required to take Geology 100. Geology 100 is normally also available in the first summer session. The core programme for a major in geology must include Geology 210 and 220 and 205B. Faculty regulations permit a student graduating with a general degree with a major in Geology to convert it to an honours degree by certificate. Note that Geology 241B does not form a part of the core programme for concentrated honours in Geology and cannot count as a credit towards an honours degree although it can form part of the General Degree Programme.

Students undertaking a general degree with a major in Geology must attend an approved field school, normally the first of the two field schools offered by the department. It should normally be taken at the end of second year.

(3) 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 Geology core programme listed below. The recommended programme is:

Year 1
Geology 100; Mathematics 100A/100B; one class in two of Physics, Chemistry, Biology; an elective (normally selected to meet the faculty requirement for a class in which writing ability is emphasized). Note that Geology 205B fits best in Year 2 of the programme and that it has Physics 1100 and Mathematics as prerequisites. Physics and Mathematics should therefore be included in Year 1 if possible.

Year 2
Core program: Geology 210, 220, 211C; one class in two of Physics, Chemistry, Biology, Mathematics; and an elective. Geology 205B is required but students not in the geophysics stream may elect to take this class in the 3rd year.

Year 3
Core program: Geology 301A, 302B, 312B, 314A, 316A; plus one class in Physics, Chemistry, Biology, Mathematics; and an elective. Students in the geophysics stream will take 205B in year 2 and 313B in year 3.

Year 4
Geology 420; 435B, other 400 level classes in Geology; and an elective.

A student who decides at the end of first year to take honours in Geology but has not taken Geology 100 in that year may take Geology 100 in the summer session or may take 100 and 210 in Year 2 if he has obtained a B+ standing in Year 1. A student who has taken Geology 100, but whose program does not meet the other requirements, should consult the department.

A student must normally complete one class in each of Biology, Chemistry, Physics, and Mathematics by the end of his second year, and a second class in one of these subjects. The recommended first classes are Physics 1100, Chemistry 110, Mathematics 100/101, Biology 1000 or 2000. Recommended second classes are: Biology 2000 or 3321; Chemistry 211B, 220A, 230A, 234B; Physics 2200A/2210B or 2300A/2330B; Mathematics 200, 220, 106/107, 227B.

Students wishing to take combined honours in geology and another subject should discuss their programme in detail with the undergraduate adviser.

Suggestions for the first three years of study are given below:

Combined honours with Biology: Students should follow the Geology honours programme in Years 1-3, including Geology 220 and 211C; but should take either a Biology class, or Geology 436A/437B in place of Geology 301A/302B. Suggested Biology classes are 1000 or 2000 in Year 1, 2040A/B, and 2060A/B in Year 2, and 2000 or 3321 or 3323 in Year 3.

Combined honours with Physics (a possible geophysics programme): Students should follow the Geology honours programme in Years 1-3, including Geology 205B and 313B, but should take a Physics class in place of Geology 301A/302B. Suggested Physics classes are 1100 in Year 1, 2300A/2330B in Year 2, and two of 2200A/2210B or 3000A/3010B or 3200A/3210B and 3160A/3170B in Year 3. Math 200 should also be taken in either Year 2 or 3.

Combined honours with Chemistry: Students should follow the Geology honours programmes in Years 1-3, but should take a 300 level Chemistry class in place of Geology 312B and 211C/313B. Suggested Chemistry classes are 110 in Year 1; 220A/211B and 230A/234B or 240 in Year 2; any 300 level Chemistry in Year 3.

Students in combined honours and unconcentrated honours programmes normally attend the field camp which is part of Geology 211C whether or not they register for

211C. This class is normally taken at the end of the second year.

Marine Geological Resources
This programme is a matter of emphasis within the regular programme and is designed for the students who plan to make a career in the rapidly expanding search for hydrocarbons and minerals on the Canadian continental shelves and the deep ocean. The honours thesis consists of a project in one of the marine related areas. Please consult the Geology Department for selection of courses.

Field Camps
Students in a concentrated honours programme must complete one field camp at the end of second year. This is an integral part of Geology 211C. The camp runs for ten days early in May in cooperation with other Maritime universities. It is held at St. Francis Xavier University, Antigonish, and is designed to introduce the simpler techniques used in geological mapping. A geophysics field school runs concurrently with the first part of this geology camp. Field excursions are a part of several classes and are conducted at appropriate times during the session. In addition, two optional field schools are held every year in foreign countries. The Joint Dalhousie-Memorial Expedition to Bermuda prepares the student for Geology 422A. The Honours Field Trip is for beginning fourth-year Honours students.

Thesis and Honours Qualifying Examination
A student in an honours degree programme may choose one of three options:
(a) A thesis as Geology 420, followed by an oral examination, based on the general subject area of the thesis. This oral examination then counts as the honours comprehensive examination.
(b) A thesis as Geology 420, and a written comprehensive examination, reflecting the content of the 300 and 400 level classes which the student has taken.
(c) An honours thesis in addition to five regular classes in the fourth year, in which case the thesis will count as the honours comprehensive examination.

Theses must be completed by the second Monday in March of the fourth year. Students who complete them after this date and before May 31, will have to graduate in the fall, not the spring. After May 31, the student must re-register for Geology 420 for the following academic year, pay the fees for that class, and graduate at the spring convocation of that academic year.

Classes Offered

100 Introduction to Geology, Lect. 3 hrs.; Lab. 3 hrs.; G.K. Muecke and Staff.

An introductory class for students who plan to take a degree in geology, 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, 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 Geology but have unresolvable scheduling conflicts with Geology 100 should consult the undergraduate adviser.

104A/105B The Earth and Man (I & II), Lect. 3 hrs.; Lab. 1 hr. per week, G.C. Milligan.

These classes are two parts of a single unit designed for students in the social sciences and humanities. Geology 104A deals with the nature and structure of the earth and with processes acting thereon, but only in sufficient depth to provide background for understanding of the matters discussed in Geology 105B, without detailed study of rocks and minerals. Previous mathematics, physics, or chemistry is not required. Students with good grades in this class may enter Geology 241B. Geology 105B applies to geological concepts learned in 104A to consider the influence of geological factors upon economic, social, and political decisions of the past and future. The class touches upon the geological factors involved in diverse matters, e.g., colonization by Greek city states, trade in mineral resources, and our perennial Canadian "freight rate" problem.

205B Principles of Geophysics, Lect. 3 hrs.; Lab. 1 hr.; P.J.C. Ryall. *Prerequisite:* Physics 110 and a first year class in mathematics.

Geophysical methods are increasingly important in geological studies. Understanding the principles of the various techniques (seismics, gravity, magnetics, electromagnetics), their powers, and limitations, provides a foundation for later more practical classes.

210 Introduction to Mineralogy and Geochemistry, Lect. 3 hrs.; Lab. 3 hrs.; D.B. Clarke. *Prerequisite:* Geology 100.

This class deals with the ways in which the chemical components of rocks are organized into crystalline compounds (mineralogy) and the ways in which chemical changes affect rocks (geochemistry). The lectures cover the crystallographic principles which determine the regular internal and external structure of minerals, the chemistry and structure of the major groups of rock-forming minerals, the ways in which minerals interact with melts, with other minerals and with solutions in geological environments, and practical applications of these principles to mineral exploration. The labs cover the identification and description of minerals both in hand specimen and with the use of the petrographic microscope.

211C Field Methods, Lect. 3 hrs.; Lab. 3 hrs.; G.C. Milligan. *Prerequisite:* Geology 100.

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. Geophysical field techniques and elementary structural geology are also considered. Both the lecture and lab part of the course, held in the fall term, and the geology field school held at the end of the spring term in Antigonish, must be completed before a final mark is awarded.

220 Sedimentology and Biostratigraphy, Lect. 3 hrs.; Lab. 3 hrs.; R. Boyd, M.R. Gibling, F. Medioli. *Prerequisite:* Geology 100 or equivalent.

The class studies the basic materials of sedimentary geology: sediments, stratified rocks and fossils. The deposits and processes seen in modern environments are related to ancient sedimentary rocks in Atlantic Canada, through field trips and lab work. Study of the fossil record places emphasis on changes through time and on the use of fossils in stratigraphy. Morphology and taxonomy are examined at an elementary level.

241B Environmental and Resource Geology, Lect., Lab. 3 hrs., one evening per week; G.K. Muecke. *Prerequisite:* any first level class in geology.

Geology lies behind many of the environmental problems facing man today. In this class we consider topics such as energy and mineral resources, geological hazards such as earthquakes, landslides, and volcanic eruptions, the relevance of geology in the fields of foundation engineering, pollution and waste disposal, and the role that geology has to play in planning urban areas, especially in Nova Scotia.

301A Igneous Petrology, Lect. 3 hrs.; Lab. 3 hrs.; P.T. Robinson. *Prerequisite:* Geology 210R.

The study of the field relations, mineralogy, texture, and geochemistry of volcanic and plutonic rocks. Lectures discuss the classification, graphical representation, means of production, differentiation, and emplacement of igneous rocks, and their grouping into co-magmatic provinces. Labs involve using the petrographic microscope to determine the crystallization history of igneous rocks through their mineralogy and texture.

302B Metamorphic Petrology, Lect. 3 hrs.; Lab. 3 hrs.; P.T. Robinson. *Prerequisites:* Geology 210R, 301A.

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. The mechanisms of metamorphic reactions and recrystallizations, the stability relations of minerals and mineral assemblages under various physical and chemical conditions, and the concept of metamorphic facies series are discussed. In the labs, microscopic mineralogy and texture are used to decipher the metamorphic history of rocks.

312B Principles of Stratigraphy, Lect. 3 hrs.; Lab. 3 hrs.; P.E. Schenk. *Prerequisite:* Geology 220R.

Stratigraphy is concerned with the interpretation of paleogeography as recorded in layered rock. This record is a complex of three dimensional rock masses to which a fourth dimension, time, must be considered for paleographic reconstruction. Establishment of time-surfaces within this rock is essential for interpretation of complexes of depositional environments - the paleogeography. The purpose of the class is to show how rock may be attacked for such reconstruction. The first five weeks deal with stratigraphic principles and the remaining eight weeks apply them to the geologic record. Laboratory assignments involve statistical and stratigraphic map problems aided by the computer. Although statistics and machine-aids are introduced, some prior knowledge is helpful.

313B General Geophysics, Lect. 3 hrs.; Lab. 3 hrs.; every other week; P. Reynolds. *Prerequisite:* Geology 205B.

A second class in geophysics designed to follow Geology 205B and a prerequisite for the several 400-level geophysics classes. Topics include aspects of applied and whole earth geophysics, and physical properties of rocks.

314A Structural Geology, Lect. 3 hrs.; Lab. 3 hrs.; R.A. Jamieson. *Prerequisites:* Geology 210R, 220R.

An introduction to the behaviour of rocks during deformation, stressing the geometrical aspects of rock structures on the scale normally encountered by the exploration geologist, and their interpretation. The laboratory exercises in the construction and interpretation of geological maps develop skill in the interpretation and graphical representation of structures in three dimensions.

316A Sedimentary Environments, Lect. 3 hrs.; Lab. 3 hrs.; R. Boyd, M.R. Gibling. *Prerequisite:* Geology 220.

The class studies siliclastic, carbonate and evaporite sediments in the context of their environments of deposition. Alluvial areas, deserts, lakes, shallow deep seas are examined, and their distinctive features are applied to the interpretation of ancient rock sequences, especially in Atlantic Canada. The nature and shape of the sediment bodies produced in these environments are related to exploration for economic deposits of coal, petroleum and minerals in sedimentary rocks.

415R Economic Geology, Lect. 3 hrs.; Lab. 3 hrs.; M. Zentilli. *Prerequisites:* 301A, 302B, 314A.

For those interested in mineral exploration. The class starts with a brief introduction to principles of exploration and mining geology, followed by a review of the processes leading to the formation of metallic mineral deposits. Later, and developed mainly as seminars, important examples of ore deposits are discussed with emphasis on their total geological environment and the development of conceptual models for their genesis. About one third of the second term will be dedicated to the geology and petrology of coal, a self-contained course offered by Dr. P. Hacquebard (unless a special class on the geology of fossil fuels has been implemented; consult department).

420 Honours Thesis

A research project and thesis are a normal part of the Honours B.Sc. programme and may be counted as a class under certain conditions. Special regulations govern this, and the student should consult the undergraduate adviser.

422A Advanced Sedimentology, Lect. 2 hrs.; Lab. 3 hrs.; P.E. Schenk. *Prerequisite:* Geology 220R.

Depositional and diagenetic environments of carbonates and some other authigenics are reviewed. The class consists of four parts. Part One involves demonstrations of methods unique to carbonate petrology; Part Two is on physical chemistry of carbonates; Part Three on recent humid and arid environments; Part Four on diagenesis (6 weeks). Laboratories deal with field and lab techniques, binocular logging of drill chips, and description of Schenk's collection from the Bahamas, Bermuda, Florida, Cuba, Persian Gulf and Australia. Seminars on specific topics may be planned.

427A Applied Geophysics, Lect. 3 hrs.; P.J.C. Ryall. *Prerequisites:* Geology 205B, 313B, or instructor's consent.

The application of geophysical methods to petroleum and mineral exploration as introduced in 205B and 313B is here treated at a more advanced level. Assignments attempt to involve the student in interpretation of realistic geophysical data.

428B Marine Geophysics, Lect. 3 hrs.; Lab and occasional sea trip to be arranged; P.J.C. Ryall. *Prerequisite:* Geology 205B, 313B, 427A or instructor's consent.

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 ect. 3 hrs.; P.J.C. Ryall. *Prerequisites:* Geology 205B, 313B and 427A, or instructor's consent. Offered in

429B Advanced Solid Earth Geophysics, L1985-86.

Essential for geology or physics students who intend to be geophysicists, the class covers the physical state and behaviour of the Earth as a whole. It shows how studies of geomagnetism, the Earth's electrical conductivity, earthquake seismology, the Earth's gravity field and the loss of heat from the Earth contribute to our present detailed picture of the Earth's interior. Methods of absolute age determination and other isotopic studies together with paleomagnetism allow us to follow aspects of the Earth's evolution to its present state.

431B Marine Geology, Lect. 3 hrs.; Lab and occasional trip on small boat to be arranged; R. Boyd. *Prerequisite:* The equivalent of 300-level classes in Geology or instructor's permission.

We study the principal techniques used by geologists working at sea, and some of the principal results obtained concerning the geology of the ocean basins.

435B Tectonics, Lect. 3 hrs.; R.A. Jamieson, J.M. Hall, and staff. *Prerequisites:* Completion of third year core courses.

This is a required class for Geology Honours students. It is intended to synthesize the various aspects of geology treated in more specialized courses through an analysis of those processes which have shaped the earth's crust in the past and continue to do so today. Part of the course deals with modern place tectonic processes as observed at active spreading centres, subduction zones, and transform faults. The rest of the course examines the structure, stratigraphy, and petrology of mountain belts like the Cordillera and the Appalachians in order to determine what processes, including plate tectonic processes, created them.

436A Principles of Pleistocene Geology, Lect. and seminar 3 hrs.; M.R. Gibling, D.B. Scott.

The special problems involved in the interpretation of Pleistocene deposits are covered. These include the origin, distribution and nature of snow and ice; movement in glaciers and ice caps; glacial stratigraphy; sea level fluctuations; ocean floor deposits; climatic changes evidenced in non-glaciated regions; theories of ice ages. Although a good background in geology is expected, some students with advanced standing in biology may be admitted. Reading forms a substantial part of the class.

437B Micropaleontology, Lect. 2 hrs.; Lab. 3 hrs.; F. Medioli. *Prerequisite:* Geology 220 or senior standing in Biology (with instructor's consent).

A general systematic study of the major groups of microfossils, mainly foraminifers, ostracoda and calcareous nanno-plankton. Particular emphasis is placed on recent microfauna and on the techniques for sampling and studying them.

438A Advanced Geochemistry, Lect. 3 hrs.; Lab. 3 hrs.; G.K. Muecke. *Prerequisites:* Geology 301A, 302B.

Geochemical aspects of ore formation and the exploration for economic mineral deposits are covered. How principles of crystal chemistry, isotope fractionation, thermodynamics, solution chemistry, etc., apply to the investigation of hydrothermal solutions, models of ore deposition and redistribution, and geochemical cycles is demonstrated. Geochemical surveys, exogenic element dispersion and the origin and evaluation of geochemical anomalies are also discussed. In the laboratory the most common methods of rock and mineral analysis and the processing of geochemical data are introduced.

439B Advanced Igneous Petrology, Lect. 3 hrs.; R.A. Jamieson. *Prerequisites:* Geology 301A, 302B.

This class deals with advanced topics in igneous and metamorphic petrology. The exact content of the class varies from year to year depending on the instructor. A project involving lab work outside the scheduled lecture time is normally part of the course.

440B Advanced Metamorphic Petrology, lect. 3 hrs.; R.A. Jamieson. Prerequisites: Geology 301A, 302B. (Offered 1985-86).

Metamorphic rocks are considered as equilibrium systems. The role of fluids in metamorphism, metasomatism and mass transport, and kinetics of metamorphic process are discussed. Laboratory projects and special topics are chosen to suit the student's interests.

Seminars

A department seminar is held on alternate weeks. Other specialized seminars are arranged on an ad hoc basis.

Graduate Classes

Some graduate classes may be suitable. Please consult the Graduate Calendar and seek advice from the Department.

German

Chairperson of Department
Friedrich Gaede

Professors
F.W. Gaede, Ph.D. (Freib.)
P. Michelsen, Ph.D. (Gott.)

Assistant Professor
A. Roulston, B.A. (Sir G. Williams)
E. Spence, Ph.D. (UBC)

Associate Professors
H.G. Schwarz, M.A. (Munich), Ph.D. (McG.)
D. Steffen, Ph.D. (Gott.)

Lecturer
G. Josenhans

German, the most widely used language in Central Europe, is spoken by approximately 100 million people as their native tongue in Austria, the two Germanies, 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 of the 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 actuality 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.

Degree Programmes

B.A.
Students concentrating on German should take a minimum of four German classes beyond the 100 level.

B.A. with Honours in German
Students considering an honours course are advised to consult the Department of German.

Combined Honours
It is possible for a student to take an honours degree combining German with another subject. Any student intending to take such a combined honours degree should consult with the two respective departments to arrange the details of such a programme.

Programme for Future Teachers of German

The Department also offers a special one-year programme in conjunction with the Department of Education for third-year students of German. All courses under this programme must be taken as a unit. Any student desiring to pursue this programme should consult with the Department.

1. *Prerequisite:* Successful completion of an intermediate German Class (such as German 200) or equivalent.

2. *Structure of Programme.*
a) intensive language training
b) philology and linguistics
c) teaching methods
d) work in German civilization

Classes marked * are not offered every year. Please consult the timetable on registration to determine if this class is offered.

German Language Studies

Introductory Classes Offered

100 German for Beginners, Lect. 3 hrs.; G. Josenhans, E. Spence.

German 100 is a seminar class for beginners, 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. The class fulfills the writing requirement for first-year students. German 100 or its equivalent is a prerequisite for all classes on the 200 level.

101 German for Beginners, Lect. 3 hrs.; G. Josenhans, E. Spence.

An introductory language class, using the same methods and goals as German 100. This class does not fulfill the writing requirement for beginning students.

105 German Reading Course for Beginners, Lect. 3 hrs.; A. Roulston.

Students acquire a knowledge of basic vocabulary and grammatical structure 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 German 100.

106 German Reading Course for Beginners, Lect. 3 hrs.; A. Roulston.

An introductory reading class using the same methods and goals as German 105. This class does not fulfill the writing requirement for beginning students.

100/105 Intensified German, Lect. 5 hrs.; Lab. 2 hrs.

The combination of German 100 and 105 is recommended to students who desire rapid progress in the German language.

*** 110 German Art and Literature,** Lect. 3 hrs.; H.G. Schwarz.

This class gives an introduction to modern German Art and Literature and their interrelationship. The class is taught in English.

Intermediate Classes Offered

Intermediate classes are based on German 100, high school German Grade 10, 11, 12 or an equivalent basic knowledge.

A combination of German 200 and German 202 serves as an accelerated Intermediate German course and is designed for students who want to make rapid progress in the language.

200 Intermediate German, Lect. 3 hrs.; G. Josenhans, H.C. Schwarz, E. Spence.

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.

201 Scientific German, Lect. 3 hrs.; E. Spence. *Prerequisite:* German 100 or equivalent.

Primarily a reading and translation class designed to enable science students to read scientific papers, reports, and articles in scientific journals in the original language. A reading knowledge of German is a prerequisite for many Ph.D. degrees.

*** 202 Exercises in Translation and Composition,** Lect. 2 hrs.; G. Josenhans. *Prerequisite:* German 100 or equivalent.

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. Dictations are given once a week. The class is conducted mainly in German.

Advanced Classes Offered

203 Advanced German, Lect. 3 hrs.; D. Steffen. *Prerequisite:* German 200 or equivalent.

Readings, essays and discussions will promote fluency in the language on the advanced level.

Study of German Literature and Culture

*** 215 Goethe's Faust,** Lect. 2 hrs.

220 Introduction to German Literature, Lect. 2 hrs.; H.G. Schwarz.

A study of texts representing major periods of German Literature since the 18th century. Special emphasis is on the interaction between literature, society and the other forms of art. The class, taught in German, also serves as an introduction to literary criticism.

*** 230 In Pursuit of Freedom from Luther to Nietzsche,** Lect. 2 hrs.

*** 235 Germanic and Greek Mythology,** Lect. 2 hrs.

*** 245 Kant and the History of German Idealism,** Sem. 2 hrs.; D. Steffen.

A study of Kant's relation to modern Rationalism and Empiricism, and an inquiry into the principles of idealism.

*** 305 History and Theory of the German Novel,** Sem. 2 hrs.; F. Gaede.

Representative works from the Baroque Age to the 20th Century are studied and the principles of the genre discussed.

*** 310 German Literature and Thought from Reformation to Enlightenment,** Lect. 2 hrs.; F. Gaede.

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.

*** 315 Goethe and the Enlightenment,** Lect. 2 hrs.; D. Steffen.

A study of German literature and thought of the time which preceded and witnessed the great revolutions of the 18th century.

*** 320 Goethe and Romanticism,** Lect. 2 hrs.; D. Steffen.

*** 324 Literature of the 19th Century,** Lect. 2 hrs.; F. Gaede.

*** 325 Modern German Literature,** Lect. 2 hrs.; F. Gaede.

A study of plays of B. Brecht and selected prose texts of Fr. Kafka, Th. Mann, and G. Grass.

*** 335 Hegel's Aesthetics and the Ancients,** Sem. 2 hrs.; F. Gaede.

*** 340 Heidegger and German Idealism,** Sem. 2 hrs.

A lecture and seminar class in which Heidegger's philosophy and views on the history of philosophy will be closely considered in relation to the phenomenon of German Idealism.

*** 345 Hegel's Philosophy of Nature,** J.A. Doull.

Hegel's Philosophy of Nature and its relation to ancient physics and modern science. The class will endeavour to discover in what sense a thinking of nature in essential continuity with ancient physics is currently possible or in what sense modern natural science constitutes a philosophy of nature.

*** 410 Aesthetic Theory,** Sem. 2 hrs.; F. Gaede.

A historical study of the development of literary theory.

*** 420 Seminar on Hegel's Phenomenology of Spirit,** 2 hrs.; D. Steffen.

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.

*** 425 Studies in German Idealism.**

Graduate Studies

The department offers a graduate programme leading to the M.A. degree. Details of the M.A. programme are given in the Calendar of the Faculty of Graduate Studies.

Health Education

HE4412A/B Human Sexuality and Educating About It, Lect. and discussion 3 credit hrs.; normally Fall; E. Belzer. *Prerequisite:* Permission of the instructor.

This class is concerned with basic knowledge and understandings regarding biomedical, psychological, historical, legal, religious, semantic and comparative cultural aspects of human sexuality from conception to senility. Consideration is given to adjustment needs and problems of children and adults in contemporary Canadian society and to educational efforts to help with them.

History

Chairperson of Department
N.G.O. Pereira

Professors
P. Burroughs, B.A., Ph.D. (Lond.), F.R. Hist.S.
M.S. Cross, B.A., M.A., Ph.D. (Tor.) — *Associate Dean, Arts & Science*
J. Fingard, B.A. (Dal.), M.Phil., Ph.D. (Lond.)
J.E. Flint, M.A. (Cantab.), Ph.D. (Lond.), F.R. Hist.S., F.R.S.C.
P. Fraser, B.A. (Cantab.), Ph.D. (Lond.), F.R. Hist.S.
H.S. Granter, B.A. (Dal.), A.M. (Harv.)
R.M. Haines, M.A., M.Litt. (Durh.), D.Phil. (Oxon.), F.R. Hist.S., F.S.A.
P.B. Waite, M.A. (U.B.C.), Ph.D. (Tor.), F.R.S.C.
J.B. Webster, M.A. (U.B.C.), Ph.D. (Lond.)

Associate Professors
J.E. Crowley, A.B. (Princ.), M.A. (Mich.), Ph.D. (Johns Hopkins)
J. Farley, M.Sc. (U.W.D.), Ph.D. (Man.), *(Biology)*
J.F. Godfrey, B.A. (Tor.), B.Phil., D.Phil. (Oxon.) — *President, King's College*
N.G.O. Pereira, B.A. (Williams), M.A., Ph.D. (U.C. Berkeley)
L.D. Stokes, B.A. (Tor.), M.A., Ph.D. (Johns Hopkins)
D. Sutherland, B.A. (Mt.A.), M.A. (Dal.), Ph.D. (Tor.)
G.D. Taylor, B.A., Ph.D. (Penn.)
M. Turner, B.A., M.A. (Manc.), Ph.D. (Lond.)

Assistant Professors
J.T. O'Brien, B.A. (Wisconsin), M.A., Ph.D. (Rochester)
D. Wootton, M.A. (Cantab.)
R. Bleasdale, B.A., M.A. (W.Ont.)

History as a Subject for Study at University

A sense of history is a primitive need felt by individuals and by groups. Just as a person needs to know who he (or she) is and how he arrived where he is, 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 whole of human experience.

Aims of Teaching and Study

The subject of history does not have a monolithic body of knowledge. Historical understanding is a matter of interpretation, of offering explanations for events and movements which are subject to constant revision by scholars. Arguments, scepticism and controversy are thus the very stuff of history. The history student does not merely acquire a particular mass of information, but learns to think independently.

Degree Programmes

Classes in history are set out below. There are several levels of study. 1000-level classes are primarily for first-year students; 2000-level classes treat broad geographical areas over specified periods; and 3000/4000 level classes provide opportunity for specialized study and advanced work for the undergraduate.

1. Bachelor's Degree Programmes
Students who wish to major in history choose a 1000-level class and at least five and no more than eight upper-level classes, of which two should be at the 3000-level. First-year students may take two 1000-level classes in history.

Students who wish to build up a greater specialization in history than the minimum requirements may do so by taking classes of an historical nature given by the Departments of Classics, Economics, Music, Philosophy, Political Science, Theatre, etc.

2. Interdisciplinary Programmes
Medieval Studies Programme.
African Studies Programme.
Canadian Studies Programme.

3. Honours Degree Programmes
Students may choose from several honours programmes: European, Canadian, North American, British Imperial/African or General. For details consult the History Honours Coordinator.

Note: Some former full-year classes are offered as two half classes or in a half-year version. Students cannot normally take more than one version of such a class. Please consult the timetable and History Calendar Supplement for current offerings and the timing of A/B classes.

Classes Offered at the 1000 Level

1000 The Making of Modern Europe, Lecture/tutorial 3 hrs.; R.M. Haines, D. Wootton, J.E. Crowley, N.G.O. Pereira, L.D. Stokes.

An introduction to the history of Europe from the beginning of the Middle Ages to the period since the end of World War II, divided into four equal periods of differing chronological length: medieval times; the Renaissance, Reformation and early modern era; the 19th century (from the French Revolution to the outbreak of World War I); and the 20th century. The lectures, supplemented by tutorials, highlight a select number of themes and problems with which Europe has been confronted and which particularly characterized its development.

1050 The Modern World, Lecture 3 hrs.; J.F. Godfrey, G.D. Taylor.

History cannot foretell the future, but historians seek to determine the origins of the problems that confront us today, and provide a perspective for people to consider how their ancestors coped with their world. This class relates current events to broader trends of political, economic and social developments in the modern industrial world.

1200 History of Canada, Lecture 3 hrs.; P.B. Waite.

The development of Canada from prehistoric Indian cultures to Pierre Trudeau. It has a central core of social and political history, but ranges across economic history as well as Canadian literature.

1300 United States History, 3 hrs.; Staff.

This class investigates the political, social and cultural development of the American colonies and the United States by addressing such fundamental matters as the coexistence of slavery with egalitarian principles, the conflict of sections over territorial expansion, the interplay of immigration with industrialization and urbanization, and the growth of the federal government's involvement in domestic and foreign affairs.

1400 Europe and the Third World, Lecture/tutorial 3 hrs.; J.E. Flint, M. Turner, J.B. Webster.

An introduction to university level work in history. This class also provides training in study habits, analysis of problems, and essay writing by examining six "units of study" in turn. These are: 1) The origins of European imperialism 2) Slavery and Empire 3) Penetration and annexation in the Tropics - India and Africa 4) Escape artists - Japan 5) Escape artists - Iran (Persia) and 6) Decolonisation. For each unit there are lectures and tutorials, and students write an essay each month in class time on each unit.

1990 Problems of Historical Study and Writing, Seminar 2 hrs. Staff.

An introduction to the problems of historical study, including the nature of historical evidence, analysis and causation. No lectures take place; instead, each student registers for a section dealing with a type of history of interest. The sections are limited to fifteen students and meet once a week. Each student must write an essay per month. The general techniques of study and writing are thus acquired by consideration of particular problems in a field of special interest to the student.

Classes offered at the 2000 level

European History

2000 Medieval Europe, Lecture/discussion 2 hrs.; R.M. Haines.

A survey of the thousand years between the end of the classical world and the beginnings of modern Europe. Original source materials in translation are carefully studied to understand the medieval world-view and the ways in which medieval history is written, and students are introduced to a wide range of topics including the intellectual, artistic and social history of the Middle Ages. Particular attention is paid to developing an appreciation of the richness of an age usually characterized as dark and unknowable.

2011A Renaissance and Reformation Europe, 1450-1650, Lecture/tutorial 2 hrs.; D. Wootton.

An investigation of major changes in Western Europe from the late medieval depression to the crisis of centralized rule and economic growth in the seventeenth century. Among the topics are the development of humanism in fifteenth-century Italy and religious reform movements in transalpine Europe, the loss of Mediterranean predominance in European commerce, the centralization of authority by national monarchies and the rebellions lodged against them, and the subjection of urban culture and commerce to court dominance.

2012B Absolutist and Revolutionary Europe, 1650-1800, Lecture/tutorial 2 hrs.; J.E. Crowley. *Prerequisites:* History 2011A or intructor's permission.

A study of Western Europe during the rise of absolutist states as agencies shaping economic and social structures. The class gauges the state's effectiveness in this role against Enlightenment writings on social and economic reform. Topics include the court of Louis XIV, peasant revolts and urban popular protest, the seigneurial regime, and autocratic reform in Spain and central Europe. We focus on the characteristic sources of social conflict in France's Old Regime and their relation to the course of the Revolution.

2020 Modern Russia, Lecture/tutorial 3 hrs.; N.G.O. Pereira.

A survey of the last two centuries of modern Russia, from 1801 to the present, focussing on factors which contributed to the decline and fall of the Romanov dynasty and the formation of the Soviet state. Readings include representative samplings of contemporary opinion as well as the most recent scholarship. No prior knowledge of Russian history is presumed.

2031A Germany in the 19th Century, Lecture/tutorial 2 hrs.; L.D. Stokes.

2032B Germany in the 20th Century, Lecture/tutorial 2 hrs.; L.D. Stokes.

Selected topics in the history of Germany during the past two centuries, including the growth of nationalism and liberalism, the role of Prussia, industrialization, Bismarck and the political parties, civil-military relations and the rise and destruction of Nazism.

2040 Modern France: From the Fall of the Bastille to the Rise of De Gaulle, Lecture 3 hrs.; J.F. Godfrey.

Selected topics in French political, military, economic and cultural history from the Revolution of 1789 to the end of the Second World War.

2050 Europe in Two World Wars, Lecture/tutorial 3 hrs.; L.D. Stokes.

2062A Italy from the Risorgimento to Fascism, 1830-1945, Lecture/tutorial 2 hrs.; L.D. Stokes.

Selected topics in the history of 19th and 20th century Italy, including the role of Piedmont in the creation of the national state, regionalism and modernization, the political weaknesses of liberal Italy, and the origins and rule of Fascism.

British and British Imperial History

2101A Medieval England, Lecture/tutorial 3 hrs.; R.M. Haines.

This class examines major political, social, cultural and economic themes and topics in English history from the Anglo-Saxons to the Wars of the Roses.

2102B Early Modern England, Lecture/tutorial 3 hrs.; D. Wootton.

This class surveys the history of England from 1450 to 1750. Among the topics dealt with are the Reformation, the Government of Elizabeth I, Parliament in the early 17th century, the Civil War, the commercial revolution, and the establishment of political stability under Walpole. Note: 2101A/2102B supersedes 2100.

2110 Modern Britain, Lecture/tutorial 3 hrs.; P. Fraser.

Six themes, chosen to reveal some of the forces which have created the modern world. They are: (1) The emergence of parliamentary government from Wilkes to the Reform Act of 1832; (2) The rise of Britain to industrial preeminence from Robert Owen to the Great Exhibition of 1851; (3) The formation of the British working class from Tom Paine to the first Labour government; (4) The development of the popular press and modern modes of publicity and agitation; (5) The expansion of England and the meaning of empire in its heyday and (6) The experience of Britain in two world wars.

2111A Britain 1760-1860, Lecture/tutorial 3 hrs.; P. Fraser.

2112B Britain Since 1860, Lecture/tutorial 3 hrs.; P. Burroughs.

2130 British Empire and Commonwealth, Lecture/tutorial 3 hrs.; P. Burroughs.

Topics and themes, chosen principally in the period from the American Revolution to the present, to illustrate the character and motivation of British expansion overseas. Changing British attitudes and policies towards the empire, problems created by the contact of white settlers and indigenous populations, colonial revolts and independence movements are discussed.

North American History

2211A The Social History of Canada to 1870, Seminar 2 hrs; M.S. Cross.

2212B The Social History of Canada since 1870, Seminar 2 hrs.; D.A. Sutherland.

This evening session surveys the development of Canadian society from the beginnings to the present. Among the themes considered are social classes, the role of women, how people worked and how they lived, conflicts such as rioting and rebellions, and specific case studies such as Indian-white relations, the Winnipeg general strike and the troubles of industrial Cape Breton. Note: 2211A/2212B supersedes 2210.

2230 Canada in the Twentieth Century, Lecture/tutorial 3 hrs.; R. Bleasdale, P.B. Waite.

A survey of the roots of contemporary Canada, studying the origins of our current issues and problems focussing on Canadian political developments, as well as on economic and social structures, French-English relations and provincial and regional disparities.

2240 French Canada, 1867 to 1967, Lecture/tutorial 3 hrs.; P.B. Waite. *Prerequisite:* It is helpful to have had a general course in Canadian History.

Given in English, for English-speaking students, although French-speaking students are welcome, this class examines French-Canadian society at the time of Confederation with brief reference to the events from 1760 to 1837. In the main deals with the development of French Canadian political and social life from 1867 to the "Quiet Revolution" of the 1960's, including both federal and provincial aspects as well as French-Canadian developments in the West, Ontario and the Maritimes. Note: also offered as 2214A/B.

2270 The Atlantic Provinces, Lecture/tutorial 3 hrs.; D. Sutherland, J. Fingard.

A 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.

2295B History of Modern Medicine, 1800-1950, Lecture 2 hrs.; J. Farley.

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 these 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 culminating in the growth of scientific medicine in the early 20th century.

2330 The United States: A Political and Economic History, Seminar 2 hrs.; G.D. Taylor.

American history features many colourful personalities and episodes from the Boston Tea Party to Watergate. Underlying these events are broad patterns of change: population movements, religious and ethnic conflict, economic development, the organization of political parties and interest groups, and unheralded but enduring shifts in the law and public opinion. This class examines public life in America from the time of Benjamin Franklin to Ronald Reagan in the context of these general processes of social, economic, and cultural development.

2340 Social History of the United States, Seminar 2 hrs.; J.T. O'Brien.

A survey of the major social and economic forces which transformed the United States from an agrarian republic to an industrial nation. Attention is drawn to the process of industrialization and such allied topics as urban growth, immigration, the rise of the corporation, the changing nature of work, and the role of government in fostering economic growth. We also look at the history of labour organizations, protest movements, and business groups that sponsored new forms of economic activity in the period from the founding of the Republic to the Great Depression.

African and Third World History

2370 Age of Imperialism 1870-1970, Seminar 2 hrs.; M. Turner.

The last hundred years of the activities of the imperial powers, their impact on the world, their rivalries among themselves and the resistance they provoked on every continent. Different forms of conquest are discussed and illustrated: the shifting power balance among the imperial powers is traced and the growth of national resistance movements and their ideologies investigated. The class gives particular emphasis to the United States as the most important imperial power of the period, to its role in Latin America and to the ideologies which inform resistance movements.

2380 Latin America: Independence and After, Lecture/discussion 2 hrs.; M. Turner.

Outlines key developments in Latin America from the independence wars to the present: the growth of nationalism, the impact of British and American capital and the development of the anti-imperialist struggle, (a) in relation to Argentina, Brazil and Chile, and (b) in relation to Mexico, Central America and Cuba. Note: also offered as 2381/2382.

2400 History of Tropical Africa, Lecture/tutorial 2 hrs.; J.B. Webster.

A study of some of the major themes of African pre-colonial and post-colonial history through an examination of the internal politics and development of African states and societies such as the Yoruba empire, Ashanti and Dahomey in West Africa, and states in East, Central and Southern Africa. The theme of cultural contact and its effects is prominent in considering Islamic and Christian penetration. This is followed by an examination of the impact of European colonial rule, the partition of Africa, and African responses which culminated in the emergence of independent African states.

2501A The Middle East to the First World War, Lecture/tutorial 2 hrs.; J.E. Flint.

2502B The Middle East since the First World War, Lecture/tutorial 2 hrs.; J.E. Flint. *Prerequisites:* History 2501 or permission of instructor.

An introduction to the basic elements of the Islamic religion and its political aspects, the currents of change in the 19th century Turkish "modernisation," European influences in the 20th century, the development of the oil industry, the emergence of the state of Israel, Arab Nationalism, and the Iranian Islamic revolution. Note: 2501A/2502B supersedes 2500.

2600 Modern East Asia, Lecture 3 hrs.; Staff.

This class examines China and Japan in the 19th and 20th centuries as they confront the modern west. Special emphasis is given to the contrast between China's response and that of Japan.

Classes offered at the 3000 level

European and British History

3000 Medieval Civilization: Sources and Literature, Seminar 2 hrs.; R.M. Haines.

History 2000 provides the appropriate background for this class. Each year a number of topics are chosen, wide enough to be used as central themes in the context of which medieval civilization can be studied; for instance monasticism, universities, papal government, and architecture. Such topics are studied in depth, with the help of available original documents (in translation) and using periodical literature. Students master the basic work in certain areas, and are also encouraged to develop special interests of their own. Class discussions are used to unravel more difficult aspects and all students contribute in this way and in the writing of a small number of well argued and documented papers. Some general books should be read before starting the class. Suggestions of this kind, with a list of the topics and appropriate explanation and bibliography, are available well in advance.

3010 England in the Later Middle Ages, Seminar 2 hrs.; R.M. Haines.

Beginning with the reign of Edward II, 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 (three if Edward V is counted), the Hundred Years' War, the Black Death, Wycliffite heresy and the Lollards, the so-called 'Wars of the Roses' and the most widespread building activity in the country since the Normans - despite an economic 'depression'. It is therefore one of exceptional interest and variety. Note: also offered as 3009 A/B

3011A/B Renaissance to Enlightenment, Seminar 2 hrs.; D. Wootton. *Prerequisites:* History 2100, 2102, 2011 or 2012, or a reading ability in a Western European language other than English.

This class examines selected aspects of the intellectual history of early modern Europe including history of science, historiography, political and moral philosophy and economic theory. Alongside general discussions of Renaissance, Reformation and Enlightenment, a number of authors are studied in detail, amongst them Machiavelli, Montaigne and Locke.

3012A/B The Emergence of Modern European Society, 1450-1800, Seminar 2 hrs.; J.E. Crowley. *Prerequisites:* same as History 3011 A/B.

As the first civilization to industrialize, Europe also had the most protracted transition from traditional to modern society. To study this centuries-long transition, this class examines such topics as the confrontation of peasant society with the commercialization of agriculture, the decline of magic in the face of increased literacy, the growth of specialized institutions to redress crime and insanity.

3030B Russian Intellectual History, Seminar 2 hrs.; N.G.O. Pereira.

A changing selection and examination of some leading examples of Russian social and political thought, including that of Belinsky, Herzen, Chernyshevsky, Tkachev, Pobedonostsev, Soloviev, Gershenzon, Trotsky, Lenin, and others.

3040 French Intellectuals in the 20th Century, Seminar 2 hrs.; J.F. Godfrey.

In France, political life and intellectual life are inseparable. This class examines the intellectual careers of Block, Maritain, Bernanos, Saint-Exupéry, Malraux, DeGaulle, Sartre, Camus, Teilhard de Chardin and Lévi-Strauss in the context of the political history of France in the twentieth century. Note: also offered as 3041/3042.

3051A/B Fascist and National Socialist Movements in Europe, 1900-1945, Seminar 2 hrs.; L.D. Stokes.

This class studies the origins, ideologies, social composition, leadership, rise to power and rule of the two principal European fascist and national socialist movements of the 20th century, those of Mussolini's Italy and Hitler's Germany, as well as similar phenomena which appeared in various countries of eastern and western Europe between the world wars. Through a comparative examination of these and other topics, the class attempts to define the nature of fascism and national socialism and to distinguish these from other contemporary European movements - in particular Soviet communism - with which they have often been associated as varieties of "totalitarianism".

3070 The Rise of Science, Lecture/discussion 2 hrs.; J. Farley.

For class description see Biology 3400.

3090A/B Aspects of Soviet Society N.G.O. Pereira. Seminar 2 hrs.

The basic institutions of contemporary Soviet society are considered both in terms of their own historical antecedents and useful comparisons with European counterparts. Topics may include the role of official culture, party machinery, the individual in society, relations with the West, science and technology, and the economy. Cross listed with Russian 309A.

3104 Tudor and Stuart Britain, Seminar 2 hrs.; D. Wootton. *Prerequisites:* History 2100 or 2102, or instructor's permission.

This class concentrates on the period 1558 to 1715. Within this period the central problem tackled is that of the causes, characters and consequences of the English Revolution. This involves a study of social and economic change, cultural values and intellectual assumptions, and political conciliation and conflict.

3106 The Victorian Age, England 1815 to 1870, Seminar with occasional lectures, 2 hrs.; H.S. Granter.

An examination of English society in the age of English dominance after Waterloo, before the advent of rampant imperialism in the 1870's. The seminars are planned to portray the characteristic features of the Early and mid-Victorian period. Each seminar discusses a major theme illustrating the unique character of this period in English and world history. Contemporary papers, pamphlets and other writing, including fiction, and, where possible, recent films, are used.

3110 Victorian and Edwardian England, Seminar 2 hrs.; P. Fraser.

An examination of selected aspects of political, social and intellectual history, such as the transformation of the Liberal party from Gladstone to Asquith, Labour and Socialist movements, or the ideals, theories and practices of imperialism in the palmy years of the Empire. Topics for selective study include Irish Home Rule, social theories, reform movements, electioneering, journalism, party organisation, the monarchy and the constitution, and naval and military reorganisation under the committee of Imperial Defence.

3111 Britain in Two World Wars, Seminar 2 hrs.; P. Fraser.

Special problems of wartime Britain - political leadership, military direction, social adaptation, morale and censorship, controls and compulsion, all related to the varying fortunes of the country at war. The central figures are Asquith, Kitchener and Lloyd George, Chamberlain, Churchill and Attlee. Attention is concentrated on the important episodes, both political and military or diplomatic.

3112A/B Edwardian England, Seminar 2 hrs.; P. Fraser.

The political, social and intellectual history of the Edwardian age. Main topics include national defence, party structures and party creeds, constitutional conflicts, and contemporary theories about society and morality.

3113A/B Britain in the Second World War, Seminar 2 hrs.; P. Fraser.

Centres on the official histories, including air power, the naval war, strategic factors, intelligence and cryptography, Anglo-US relations, the scientific war, morale and war aims.

North American History

3230 Canadian Working Class History I, 1850-1914, Seminar 2 hrs.; R. Bleasdale.

The transition to industrial capitalist society in Canada and the creation of a working class are the general themes of this course. Topics include pre-industrial work, the development of trade unions, strikes, immigration, poverty, violence, women at work, working class culture, labour in politics, and the emergence of socialism. Students write research papers based on primary sources. There are no formal prerequisites but History 2230 or 2270 would be helpful.

3231 Canadian Working Class History II, The Twentieth Century Experience, Seminar 2 hrs.; R. Bleasdale.

The development of the Canadian working class movement from 1896 to the present. Topics include the degradation of work, the question of international unions, labour in politics, women and trade unions, the role of the state in industrial relations, and working class culture in mass society. Students write research papers based on primary sources. There are no formal prerequisites but History 2230 or 2270 would be helpful.

3240 Violence and Order in Canada, 1815-1939, Tutorial 2 hrs.; M.S. Cross.

This class attempts to uncover the causes of violence, to analyze its types and forms, and to assess the responses of authority to different kinds of disorder. Original documents are employed as well as more conventional sources. Useful preparatory reading is Hugh Davis Graham and Ted Robert Gurr, ed., *Violence in America: Historical and Comparative Perspectives* (New York, 1969). Note: also offered as a half class.

3250 Canada within the Empire, 1760-1914, Seminar 2 hrs.; P. Burroughs.

An examination of the political, commercial and cultural relations of Canada with Britain from conquest to nationhood, the changing attitudes of Canadians and Englishmen to the developing empire, and the interplay of imperial policies and colonial conditions.

3270 Nova Scotian Society, 1790-1945, Seminar 2 hrs.; J. Fingard, D.A. Sutherland.
Major themes in the social, economic and political evolution of provincial society are explored in an effort to identify the major forces which, since the mid 18th century, have worked to shape the Nova Scotian identity. Discussion involves both existing historical literature and original student research. No prerequisites exist but participants should have some familiarity with Canadian history.

3280 Disreputable Pleasures: Popular Diversions and Common Vices in Canada, Lecture/tutorial 3 hrs.; M.S. Cross.

Popular diversions tell much about the character and values of society. This class explores the significance of sports, popular music, rioting, prostitution, drinking and other pleasures. As well, it considers the response of the respectable to these activities. Topics considered include: the temperance movement and industrial discipline; religious revivals; the invention of sport; changing attitudes to prostitution; and contemporary technological diversions. Note: also offered as a half class.

3286A/B The Urban Experience in Canada, Seminar 2 hrs.; D.A. Sutherland.

The rise of the city stands as one of the most crucial changes to have taken place in our collective past. This class explores the reasons for and the impact of urbanization within Canada. Emphasis is on developments from the mid 19th century to the present.

3291A/B Wealth and Power in Canada, Lecture/seminar 2 hrs.; G.D. Taylor.

The role of business in the development and underdevelopment of Canada, and particularly the Atlantic region, is the focus of this class. Among the subjects covered are the significance of entrepreneurship in regional and national economic growth; the impact of government on business; the rise of big business and managerial organization; and the role of foreign investment in Canada.

3330 The United States, Canada and the World, Seminar 2 hrs.; G.D. Taylor.

During the past century both nations of North America evolved from sparsely settled agricultural societies to complex industrial nations with increasing influence on, and dependence upon, developments throughout the rest of the world. This class traces the rise of the United States in global political and economic affairs, and reviews the role of the United States in the transformation of Canada since the early 19th century. The class focuses on diplomatic affairs, military conflict and cooperation, the rise of multinational enterprise, and the impact of technology in shaping America's relations with Canada and the world.

3341A/B Revolutionary America, 1760-1815, Seminar 2 hrs.; J.E. Crowley.

The origins of the American revolution in colonial society and politics and the alterations of social, economic and political life resulting from the crises. Themes of particular interest are the popularization of politics, the social conflicts resulting in Loyalism, the development of a national political economy and constitutional tradition, and the cultural changes associated with republican government and egalitarian ideology.

3350A/B Family and Community in North America, 1600-1900, Seminar 2 hrs.; J.E. Crowley.

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 constriction of the family's responsibilities in economic life and education; the role of ideology in shaping sex roles and childrearing; and the relations of family and community according to ethnic group, class and economic setting.

3360 Enslavement and Emancipation: Afro-Americans in the U.S. South to 1900, Seminar 2 hrs.; J.T. O'Brien.

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.

3390 Empire and Revolution in the Caribbean, Seminar 2 hrs.; M. Turner.

Caribbean wealth and Caribbean revolutions have made the islands a focus of imperial rivalries for more than three centuries. This class deals with (a) 1750-1880: the chattel slave societies created by mercantile capital and their destruction by the forces of economic and political revolution and (b) 1895 to the present: the impact of 20th century imperialism and the emergence of nationalism and socialism. Particular attention is paid to Cuba and Grenada. Note: also offered as 3391/3392A/B.

African History

3440 African History from Oral Tradition, Seminar 2 hrs.; J.B. Webster.

For those students who have a keen interest in African history, the class concentrates upon a restricted geographic area and considers myths of origin, allegory and symbolism in oral traditions, how political leaders become national deities through ancestor worship and how feminist movements of the past have been handled by male chroniclers. In addition the class concentrates upon dating oral traditions through genealogies, eclipse-references, famines and cross referencing.

3450 South Africa since 1806, Seminar 2 hrs.; staff.

The class examines not only political changes and race relations in South Africa but also the effects of mining capital on rural and urban societies. The main themes considered are: the Mfecane and its effects on Southern Africa, the economic transformation of South Africa and its impact on political and social developments in the region, the imperial factor, the growth of African and Union Afrikaaner nationalisms and the development of apartheid, South Africa and the wider world.

Other classes

3610A/B Women in Capitalist Society: the North American Experience, Seminar 2 hrs.; J. Fingard.

An examination of the impact of industrialization and urbanization on 'woman's sphere' in society and of the emergence of various strains of feminism in the 19th and 20th centuries.

3612A/B Women in Socialist Society: Soviet, Cuban and Chinese Experiences, Seminar 2 hrs.; M. Turner.

Investigates the progress made towards the achievement of equal status for women in societies dedicated in principle to equality for all.

3980A/5980A Canadian Historiography, Seminar 2 hrs.; M.S. Cross.

The history of English-Canadian historical writing. Historians under consideration include Frank Underhill, Harold Innis, Donald Creighton, Arthur Lower, and W.L. Morton. Other topics include Canadian regional traditions and the development of new historical approaches. This course is primarily for M.A. students in Canadian history and for honour students in North American history. Others interested should see the instructor.

4000A/B Directed Readings, Staff. This class is open to 4th year honours students and honours certificate students only.

4010 Palaeography, R.M. Haines. *Prerequisite:* Permission of the instructor.

Concerned with the development of handwriting in Western Europe, this is a practical class intended to assist the student in the identification, reading and transcription of original documents. A basic knowledge of Latin is necessary.

4990 Honours Essay, Staff.

All history honours students and those in combined honours courses in which history is their principal subject must write a substantial essay on a topic to be chosen in consultation with the Undergraduate Committee. The essay is related to one of their 3000 or 4000 level classes and is supervised by the appropriate staff member.

Graduate Studies

M.A. and Ph.D. programmes in history are offered. For details of these programmes, see the Calendar of the Faculty of Graduate Studies.

Humanistic Studies in Science

Attention is drawn to the following classes, offered in several departments. All of these classes are concerned with the humanistic aspects of scientific thought and its development.

Classes marked * are not offered every year. Please consult the timetable on registration to determine if these classes are offered.

History of the Sciences

*** Biology 3400/Physics 3400/History 3070, Religion 3500, The Rise of Science and the Modern World,** J. Farley (Biology), R. Ravindra (Physics).

*** Biology 3401A, A History of the Biological Sciences,** J. Farley.

History 2295A/B. The History of Modern Medicine, J. Farley.

Psychology 4580, History of Psychology, J.W. Clark.

Philosophy of the Sciences

*** Philosophy 241A, Philosophy of Psychology,** T. Tomkow.

*** Philosophy 242B, Philosophy of Biology,** R. Campbell.

Biology 3410B, Man in Nature, K.E. von Maltzahn.

*** Religion 2351, Mystical Consciousness and Modern Science,** R. Ravindra.

Linguistics

Various departments offer classes in linguistics or in some aspect of linguistic study in the broad sense: *French* (3020 Linguistics, 3025A Linguistic Introduction to Acadian Dialectology, 4010A Evolution of Modern Linguistics, 4000 History of the French Language, 3010 Phonetics, 4015 Advanced Translation into English, 4011B Lexicology), *English* (201 The English Language, 202 History of the English Language, 253 Old English, 351 Middle English), *Philosophy* (330B Philosophy of Language, 451 Topics in the Philosophy of Language), *Sociology and Social Anthropology* (2270 Language and Culture), *Psychology* (319 Psychology of Language), *German* (various classes), *Russian* (400 The Structure of Contemporary Standard Russian), *Classics* (several classes in Greek, Latin, Hebrew, Coptic, Syriac), *Spanish* (404A Advanced Style and Syntax). Further information about these classes will be found under the departmental listing. It should be noted that some of the classes listed may not be offered in the current year.

Marine Biology

The Biology Department offers an Honours Degree in Marine Biology. See *Biology* for details.

Marine Geological Resources

The Geology Department offers an Honours Programme with specialization in Marine Geological Resources. See *Geology* for details.

Mathematics, Statistics and Computing Science

Chairperson of Department
K.A. Dunn

Professor Emeritus
M. Edelstein, M.Sc. (Jerusalem), D.Sc. (Technion-Haifa)

Professors
M.A.H. Dempster, M.S., Ph.D. (Carnegie-Mellon) (jointly with Business Administration)
C.A. Field, M.Sc., Ph.D. (Northwestern)
P.A. Fillmore, M.Sc., Ph.D. (Minnesota), F.R.S.C.
R.P. Gupta, M.Sc. (Agra), Ph.D. (Delhi)
P. Keast, Ph.D. (St. And.)
K.J.M. Moriarty, M.Sc. (Dal.), Ph.D. (Lond.)
H. Radjavi, M.A., Ph.D. (Minnesota)
W.R.S. Sutherland, M.Sc., Ph.D. (Brown)
S. Swaminathan, M.A., M.Sc., Ph.D. (Madras)
H.J. Thiebaux, M.A. (Oregon), Ph.D. (Stanford) (jointly with Community Health and Epidemiology)
A.J. Tingley, M.A., Ph.D. (Minnesota)
A.C. Thompson, Ph.D. (Newcastle upon Tyne)

Associate Professors
J. Borwein, M.Sc., D.Phil. (Oxford)
A.G. Buckley, M.Sc. (Alta.), Ph.D. (U.B.C.)
J.C. Clements, M.A. (U.B.C.), Ph.D. (Tor.)
K.A. Dunn, M.Sc., Ph.D. (Tor.)
B.W. Fawcett, M.Sc., Ph.D. (McMaster)
G. Gabor, M.Sc., Ph.D. (Eotvos)
J.B. Garner, M.Sc., Ph.D. (Nottingham) (jointly with Community Health and Epidemiology)
L.A. Grünenfelder, Ph.D. (E.T.H. Zurich)
C.S. Hartzman, M.S. (Purdue), Ph.D. (Colorado)
R. Paré, M.Sc., Ph.D. (McG.)
J. Phillips, M.A., Ph.D. (Oregon)
P.N. Stewart, M.A. (Berkeley), Ph.D. (U.B.C.)
K.K. Tan, Ph.D. (U.B.C.)

Assistant Professors
P. Borwein, M.Sc., Ph.D. (U.B.C.)
A.A. Coley, Ph.D. (Lond.)
J. Gribble, Ph.D. (St. Andrews)
D. Hamilton, M.A., Ph.D. (Queen's)
R.D. Holmes, M.S. (Princeton), Ph.D. (Dal.)
K.P. Johnson, M.Sc. (Tor.), Ph.D. (Brandeis)
R.J. Nowakowski, M.Sc., Ph.D. (Calg.)
C.C.A. Sastri, M.Sc. (Andhra), Ph.D. (New York)
A. Sedgwick, Ph.D. (Tor.)
D.P. Wiens, M.Sc., Ph.D. (Calg.)
R. Wood, M.Sc. (McM.), Ph.D. (Dal.)

Learning Centre Director
P. Stevens, M.Sc., (Delft)

Computing Lab Director
R. Hody, B.Sc. (McG.)

Postdoctoral Fellows
B. Brenken
P. O'Neill
B. Solel
G.A. Willis

Degree Programmes

One full credit in mathematics other than Mathematics 102 and 110 is required for a B.Sc. degree.

Mathematics as an area of concentration.
Students who plan to major in Mathematics should arrange a programme in consultation with the department.

Majors in Mathematics must obtain at least four Mathematics credits beyond the 100 level. Amongst these, the following are required: Mathematics 200 (or 250 or 220), 203-204 (or 213), and at least one credit beyond the 200 level.

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 suggested Honours programmes (see below), after possibly replacing 213R with 203A and 204B, 250R with 220R or 200R, and 350R with 309A and 310B.

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.

Honours in Mathematics

The following programme is normally followed by students who plan to take honours in mathematics.

Entering students who have a strong interest or background in mathematics, or who contemplate taking honours, should enroll in a special section of Math 100 and 101.

Year II
Mathematics 213 and 250. Mathematics 213 may be taken in Year I by well-qualified students with the consent of the instructor, in which case another class may be selected in Year II.

Year III and Year IV
Mathematics 303, Mathematics 350 and five additional classes at least two of which are numbered 400 or above.

Students may choose programmes with a concentration in Applied Mathematics, Computing Science, Pure Mathematics or Statistics. Students wishing to concentrate in Computing Science should consider Combined Honours in Mathematics and Computing Science, and examine the separate Calendar entry for Computing Science.

All honours programmes must be approved by the Chairman.

Those students wishing to take an Honours degree concentrating in Applied Mathematics are advised to consider a programme similar to the following:

1st year: 100A; 101B; CS140A; CS141B; 3 elective classes.

2nd year: 250R; 213R; 207A; 208B; 227B; (Co-op Seminar) and 1-1/2 elective classes.

3rd year: 350R; 303R; 311A; two of 321A, 330A, 326B, an appropriate statistics class; 1-1/2 elective classes.

4th year: Either 440 or 441; the remaining two of 321A, 330A, 326B, an appropriate statistics class; one and a half other classes at 400 level; 2 elective classes.

Those students wishing to take an Honours degree concentrating in Pure Mathematics are advised to consider a programme similar to the following:

1st year: 100A, 101B, CS140A; CS141B; 3 elective classes.

2nd year: 250R; 213R; another full mathematics class; 2 elective classes.

3rd year: 350R; 303R; another full mathematics class; 2 elective classes.

4th year: 401A; 414A; three other full mathematics classes, at least one of which is at the 400 level; 1 elective class.

It is recommended that the additional mathematics classes include a statistics class, an applied class and a class in algebra, topology or complex variables.

Honours 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.

Entering students should take Math 100/101 and Computing Science 140/141 during their first year.

The programme of study for years 2, 3 and 4 is as follows:

Year	*Statistics*	*Mathematics*
II	207A, 208B	203A, 204B or 213R 200R or 250R
III	336A, 346B 334A, 338B	309A 308B or 310B or 311B
IV	406R 462A, 407B	

In addition 2-6 further ½ classes are required from Statistics 337B, 339B, 335B, 408A, 410B to make up the usual 9-11 class concentration.

Honours Comprehensive Examination

The Honours Comprehensive Examination 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.

Combined Honours

Students interested in taking honours in mathematics and another subject as a combined programme should consult the chairman of the department through whom a suitable course of study can be arranged.

A combined honours programme may be appropriate for many. Students contemplating a combined honours course in mathematics 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.

Co-operative Education Programme

The Co-operative education programme integrates the usual honours 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 and laboratory positions primarily in the Maritime region. The work experience helps students see the applicability of their training in mathematics and computing science and helps them make intelligent career choices. Upon successful completion of the programme the student receives the Honours Degree and the University transcript indicates that the programme was a cooperative one.
It is possible to complete a Co-op degree in 4 1/3 years, although students should expect to take 5 years. There is some freedom in how the work term/academic term sequences may be arranged and students should be prepared to be flexible.

There are three Co-op programmes available within this department, in the areas of;

Mathematics,
Mathematics and Computing Science, and
Computing Science.

A Combined Honours Co-op degree, combining Mathematics or Computing Science and another appropriate subject, is possible. Students interested in such a programme should consult the Director of Co-op Education.

Eligibility
Students are required to demonstrate
(1) sufficient academic potential;
(2) a suitability for and interest in Co-op education;
(3) successful completion of an appropriate combination of the classes M100/101 and CS140/141. Normally all four of the half-classes would have been completed.

Normally, students entering their second year of study may apply for admission to one of the Co-op programmes.
However, interested first-year students are strongly urged to contact the Director of Co-op Education as early as possibly for advice on course selection.

Work Terms
It is ultimately the responsibility of the student to arrange the work term. The Programme Director serves to co-ordinate the contacts between student and employer. Students are remunerated according to the employer's policies regarding permanent employees of similar training and education. At the end of each work term, each student must submit an acceptable work report.

It is important that students realize that successful completion of the work terms are an integral part of the course of study. Indeed, the advantages of Co-op Education derive directly from the successful interplay of academic knowledge and practical implementation. Consequently the work terms are central to Co-op Education.

Work terms are each of four months duration. Two consecutive work terms may be taken. Work terms are arranged subject to the student's academic preparation and the availability of suitable placements. Various combinations of work term/academic term sequences are permissible, subject to the approval of the Director of Co-op Education.

Under normal circumstances, the following criteria apply
(1) At least 4 academic terms must be completed before the first work term is begun;
(2) In any twelve-month period (of full-time study) at least one academic term must be completed;
(3) The last semester in the programme must be an academic term.

Co-op Seminar
This is a special seminar arranged for the benefit of Co-op students. Various topics of relevance to the work terms are discussed. The purpose of the seminar is to prepare students better for their work terms so that everyone involved in the work term, the student, the employer and the University may benefit as much as possible.

Co-op students enrolled in their second year at Dalhousie must attend this non-credit seminar.

Academic Requirements
The academic requirements for Co-op students are similar, although not identical to, the requirements for standard Honours students. There are some differences in the courses required and the administration of the Honours Comprehensive Examination. In addition, all relevant Faculty regulations must be satisfied.

Additional Information
For additional information, course selection advice, and entry into one of the Co-op programmes, contact the Director, Co-operative Education, Department of Mathematics, Statistics and Computing Science, Dalhousie University, Halifax, Nova Scotia, B3H 4H8.

First-year students who are interested in a Co-op programme are urged to contact the Director before or during their first year for advice on course selection.

Classes Offered

The listed prerequisites indicate the mathematical background expected of students entering any class but may be waived with the consent of the instructor.

Class descriptions for Computing Science can be found in the calendar under Computing Science.

001R Fundamentals of Mathematics, Lect. 3 hrs. (non-credit class).

May be offered in place of senior matriculation mathematics as a prerequisite for first-year classes at the University. Normally, junior matriculation mathematics as taught in Grade XI in Nova Scotia is expected as a background but mature students or others who are well motivated are able to cope with this class. After a review of elementary algebra, functions (exponential, logarithmic and trigonometric) and analytic geometry are studied. In addition to preparing students for the calculus, the class is useful for those wishing to build up their knowledge of the fundamentals of mathematics for other reasons.

The following two classes, Mathematics 100 and Mathematics 101, 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. These two half-classes are offered in both terms.

100A/B Differential and Integral Calculus, Lect. 3 hrs.; Tut. 1 hr. *Prerequisite:* Nova Scotia Mathematics 441 or equivalent. Credit will be given for only one of Mathematics 100, 110, 112, and 128.

A self-contained introduction to differential and integral calculus. The topics include: functions, limits, differentiation of polynomial, trigonometric, exponential and logarithmic functions, product, quotient and chain rules, applications of differentiation, antiderivatives and definite integrals, integration by substitution. A sequel to this class is Mathematics 101.

101A/B Differential and Integral Calculus, Lect. 3 hrs.; Tut. 1 hr. *Prerequisite:* Mathematics 100.

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.

Credit can be given for only one of Mathematics 101 and 129.

***102R Mathematics for Liberal Arts Students,** Lect. 3 hrs. *Prerequisite:* Nova Scotia Mathematics 441 or equivalent.

For students who wish to become acquainted with mathematics as an art rather than as a tool for the sciences. It discusses some of the more elementary yet interesting aspects of the subject with an emphasis on the historical origins of the various topics. Topics include elementary number theory; finite and infinite sets; graph theory; colouring problems; elementary topology; topics from geometry. This class may not be used to satisfy the requirement that B.Sc. students must have at least one full university class in mathematics.

106A/B Introductory Statistics for Non-Mathematicians, Lect. 3 hrs. *Prerequisite:* Nova Scotia Mathematics 441 or equivalent.

Through extensive use of illustrative real-life examples drawn from a wide variety of disciplines, the student is introduced to the basic concepts of statistics: data reduction, estimation, and hypothesis testing. The emphasis is on statistical concepts, rather than mathematical manipulations. The principal aim is to enable students to identify and formulate the statistical aspects of real-life problems and to become familiar with the statistical vocabulary most commonly used in scientific journals. The student requiring a more extensive exposure to the statistical methods of scientific experimentation should follow this class with Mathematics 107. Topics include descriptive statistics, elementary probability and distributions, estimation, hypotheses testing and regression. Mathematics 107 is a natural sequel for this class. Students may obtain credit for only one of Mathematics 106, 207 and Economics 2222 and only one of Mathematics 107, 208 and Economics 2223.

107A/B Statistical Techniques of Scientific Experimentation, Lect. 3 hrs. *Prerequisite:* Mathematics 106.

A continuation of 106 including collection of techniques widely used in the experimental sciences. Topics include regression and correlation analysis, analysis of variance, and curve fitting techniques. The presentation of these topics includes consideration of the statistical aspects of experimental design. The objectives are: 1) to explain what information can be obtained from experiments through use of these techniques; 2) to explain the assumptions that must be satisfied before these techniques can be applied; 3) to illustrate the nature and methods of the necessary computations. Students may obtain credit for only one of Mathematics 106, 207 and Economics 2222 and only one of Mathematics 107, 208 and Economics 2223.Students planning to take higher level statistics classes are strongly advised to take Mathematics 207/208 instead of 106-107.

108A Introductory Statistics for Pharmacy Students, Lect. 3 hrs. *Prerequisite:* Nova Scotia Mathematics 441 or equivalent.

Designed primarily to fit the specifications of the College of Pharmacy. Most of the class is devoted to a study of elementary statistics with applications to the Health Sciences. Topics include descriptive statistics, estimation, hypothesis testing, regression and analysis of variance. The last 20% of the class is intended to prepare students for Mathematics 112B. Topics include functions and graphs, linear and quadratic equations, exponential and logarithmic functions. Credit can be given for only one of Mathematics 106, 108.

110R Mathematics for Commerce, Lect. 3 hrs. *Prerequisite:* Nova Scotia Mathematics 441 or equivalent.

A survey of mathematical techniques useful in analyzing mathematical models in economics and management. The material covered in the class is similar to that presented in Mathematics 100 together with an introduction to matrix algebra, the simplex method, maximization of functions of two variables and Lagrange multipliers. A survey class for students who are not going to take further work in mathematics. Students who are going to take other mathematics classes should take Mathematics 100/101 rather than Mathematics 110. This class may not be used to satisfy the requirement that B.Sc. students must have at least one full university class in mathematics.

112B Introductory Calculus for Pharmacy Students, Lect. 3 hrs. *Prerequisite:* Mathematics 108.

This sequel to Mathematics 108 is designed primarily for Pharmacy students. Calculus is introduced and computational techniques stressed. The techniques are applied to commonly occurring functions in pharmacy: namely power, exponential, logarithmic, and S-shaped functions. Basic topics include limits and continuity, the derivative, and the definite integral. At the end of the class elementary differential equations and their application to pharmacokinetics are discussed. Credit can be given for only one of Mathematics 100, 112.

128A/129B Differential and Integral Calculus for the Engineering Programme. *Prerequisite:* Nova Scotia Mathematics 441 or equivalent.

Mathematics 128A includes a review of precalculus mathematics, functions, limits, continuity, differentiation and integration of polynomials, exponential, logarithmic and trigonometric functions. Applications to finding areas, graphing, maximum-minimum problems and related rate problems. Mathematics 129B includes vector algebra, techniques of integration, numerical integration, lengths of curves, vectors, lines and planes in three dimensions, surfaces of revolution, parametric equations and polar coordinates. 128A is a prerequisite for 129B.

200R Intermediate Calculus, Lect. 3 hrs. *Prerequisite:* Mathematics 101.

Topics include: continuous functions and their fundamental properties, partial derivatives and applications, multiple integrals, geometry of Euclidean vector spaces with emphasis on three dimensions, elementary differential equations. Credit can not be given for more than one of Mathematics 200, 220, 248-249 and 250.

***202R Logic, Sets and Number Systems,** Lect. 3 hrs. *Prerequisite:* Mathematics 101.

Basic concepts from set theory and logic form the basis of this class. Symbolic logic is introduced and a working knowledge of the logical connectives, including the universal and existential quantifiers, achieved and used to make precise certain statements in mathematics. The concepts of a tautology and a proof are studied. The number systems are constructed from a Peano System and sufficient abstract algebra is introduced to make these constructions self-contained.

203A/B Matrix Theory, Lect. 3 hrs. *Prerequisite:* Nova Scotia Mathematics 441 or equivalent.

Topics include the following: solutions of systems of linear equations, matrices and matrix algebra, equivalence, rank, inversion, determinants, and applications of matrix techniques. Students should note that this is a second year class and, although it has no formal first year prerequisites, mathematical maturity and ability to handle formal proofs at the level of a student who has completed Mathematics 100 is expected.

204B Linear Algebra, Lect. 3 hrs. *Prerequisites:* Mathematics 203 and 100.

Topics include the following: vector spaces, bases, dimension, linear transformations, representation of linear transformations by matrices. Not more than one credit can be given for Mathematics 203-204 and 213.

***205R Problems in Geometry,** Lect. 3 hrs. *Prerequisite:* Mathematics 101.

This class is organized around a sequence of stimulating geometrical problems. A set of approximately 20 challenging problems is given to the students at the beginning of the year. The students are expected to attempt these problems throughout the year. Good students should be able to do some of these problems and are encouraged to present their solutions to the class for extra credit on the final grade. These problems are chosen so that their solutions use a wide variety of geometrical ideas (from Combinatorial, Projective, Inversive, Transformational, Topological, Differential and Non-Euclidean Geometry).

207A/B Introduction to Probability and Statistics I, Lect. 3 hrs. *Prerequisite:* Mathematics 100.

A basic introduction to the concepts of probability and statistics. The subject matter is developed systematically with an emphasis on results of an important practical nature. The class is well suited for any student with a knowledge of calculus who wants a basic understanding of statistical procedures and tests. *Topics include:* descriptive statistics, counting techniques, combining elementary probabilities, normal theory estimation and inference for one and two samples, one way analysis of variance and simple linear regression. Not more than one-half credit can be given for Mathematics 106 and 207.

208B Introduction to Probability and Statistics II, Lect. 3 hrs. *Prerequisite:* Mathematics 207A and 101 or 203. Some knowledge of matrices is assumed.

A continuation of 207A, this class deals with commonly used data analysis techniques and related topics in probability theory and mathematical statistics. *Topics include:* discrete and continuous random variables, sampling distributions, central limit theorem, multiple regression analysis, analysis of variance, inference of binomial data, contingency tables. Natural sequels for this class are Mathematics 334, 335, 338, 339 and 346. Not more than one-half credit can be given for Mathematics 107 and 208. Not more than one credit can be given for Mathematics 207-208 and the previous class 206.

209A Intermediate Statistics for Non-Mathematicians. (Same as Nursing 5020A.) *Prerequisite:* Mathematics 106.

This class is designed so that students will be able to select appropriate statistical methods to analyse categorical, ordinal and measurement data and to carry out the analysis on the computer using the MINITAB and GLIM statistical languages. Topics to be covered include least squares methods and F-test in multiple regression and analysis of variance via regression, analysis of crossed and nested designs, rank methods, analysis of count or frequency data with log linear models, power of a test. This class is intended primarily for students in the Master of Nursing programme and is NOT available for credit in the Faculty of Arts and Science.

213R Linear Algebra, Lect. 3 hrs. *Prerequisite:* Mathematics 101.

For students who are interested in a broader and more basic understanding of the theory and techniques of linear algebra than is provided by 203 and 204. Topics include: the material of 203 and 204, canonical forms including the Rational Form and Jordan Form, inner product spaces including the Spectral Theorem for normal operators on finite dimensional vector spaces, linear programming and further topics in pure and applied linear algebra. This class provides an excellent background for further study in Mathematics. Not more than one credit can be given for Mathematics 203-204 and 213.

220R Applied Intermediate Calculus, Lect. 3 hrs. *Prerequisite:* Mathematics 101.

Designed with the needs of science and engineering students in mind. It includes the topics: functions of several variables, vector analysis, line and surface integrals, integral theorems, differential equations and series of functions of two and three variables. Credit can not be given for more than one of Mathematics 200, 220, 248-249 and 250.

227B Introduction to Numerical Linear Algebra, (Same as Computing Science 227B). Lect. 3 hrs. *Prerequisites:* Mathematics 101, 203 and Computing Science 141 (with a grade of B-or better).

For description see Computing Sciences 227B.

230A/B Introduction to Models of Applied Mathematics, Lect. 3 hrs. *Prerequisite:* 101 and Computing Science 140.

An introduction to the application of mathematics in the social and life sciences. About six problems are analyzed by developing and solving mathematical models. Deterministic, axiomatic, probabilistic, and simulation models are covered. Areas from which the problems are drawn include assignment and transportation problems, measurement theory, social choice, conflict resolution, inventory management, queuing, epidemiology, and resource management.

248A/249B Intermediate Calculus for the Engineering Programme. *Prerequisite:* Mathematics 129 or 101.

The topics for these two half classes include functions of several variables, partial derivatives, multiple integrals, indeterminant forms, improper integrals, infinite series, power series, Taylor and MacLaurin series, matrices, determinants, systems of linear equations, complex numbers, elementary ordinary differential equations. Students who take Math 248/249 may not also receive credit for 200 or 220.

250R Introductory Analysis, Lect. 3 hrs. *Prerequisites:* Good standing in Mathematics 101 and concurrent registration in Mathematics 213.

For honours students and other serious students of mathematics. This class forms the first half of a 2-year sequence in analysis and advanced calculus; Mathematics 350 completes the sequence. Topics include: real and complex numbers, set theory, elementary topology of Euclidean space, limits and continuity, differentiation of functions of several variables, the Riemann integral, line and surface integrals, Green's, Gauss' and Stokes' theorems, power series. Credit can not be given for more than one of Mathematics 200, 220, 248-249 and 250.

***254A/B Basic Set Theory,** Lect. 3 hrs. *Prerequisite:* Mathematics 100.

A simplified introduction into basic topics of set theory. Matters discussed include: sets and relations, countable and uncountable sets, cardinality in general; partial order, maximal and minimal elements, functions and operations on them; elementary topology of the real line, continuity and related topics.

***260A/B Theory of Interest,** Lect. 3 hrs. *Prerequisite:* Mathematics 101 or 110.

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.

***280A/B Applied Mathematics for the Life Sciences,** Lect. quisite: Mathematics 100. *Recommended: 3 hrs. Prere*Biology 1000.

A preparation for the mathematical aspects of advanced courses in ecology, genetics, and physiology. Topics include: complex numbers, vector spaces, discrete mathematics and linear algebra, and differential equations. Students are introduced to each area through examples drawn from various areas of biology. Mathematics majors may not apply credit for Mathematics 280 towards the major requirements, although they may take Mathematics 280 as an elective.

***301A/B Mathematical Logic,** Lect. 3 hrs. *Prerequisites:* Mathematics 200 and 204.

Symbolic logic is introduced first so that students who have not had any previous experience handling connectives, quantifiers and tautologies have an opportunity to practice using them. Next propositional logic is studied. This system of mathematical logic affords the opportunity of studying a formal language which is quantifier-free and so introduces, in a relatively uncomplicated setting, the background for predicate logic. The work is carried as far as Henkin's Extended Completeness Theorem.

***302A/B Set Theory and Foundations of Analysis,** Lect. 3 hrs. *Prerequisites:* Mathematics 200 and 213 (or 204).

This class concerns the basic objects of mathematics and the proper way of dealing with "infinity". It is essential for a clear understanding of most modern aspects of mathematics. The topics include: operations with sets, countable and uncountable sets, cardinal numbers, ordered sets, well-ordering, ordinal numbers, the axiom of choice and its equivalents, and axiomatics in set theory.

303R Abstract Algebra, Lect. 3 hrs. *Prerequisite:* Mathematics 204 or 213.

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.

304A/B Metric Spaces and Elementary Topology, Lect. 3 hrs. *Prerequisites:* Mathematics 200 and 213 (or 204).

Topics include: metric spaces: bounded-, totally bounded-, compact- and complete sets in metric spaces; Lipschitz and contraction mappings; topological spaces; open and closed sets, bases; continuity, compactness, connectedness.

***305R Differential Geometry and Tensor Analysis,** Lect. 3 hrs. *Prerequisites:* Mathematics 200 and 213 (or 204).

The material consists of two parts. The first part discusses the theory of curves and surfaces in three-dimensional Euclidean space. Topics include: theory of curves, surfaces, first and second fundamental forms, Gaussian and mean curvature, formulae of Weingarten and Gauss, geodesic curvature and geodesics. The second part consists of an introduction to Riemannian geometry, and, if time permits, an introduction to general relativity as an application of Riemannian geometry. Topics include: foundations of tensor calculus, differentiable manifolds, foundations of Riemannian geometry, absolute differentiation and connexions.

***307A/B Theory of Numbers,** Lect. 3 hrs. *Prerequisite:* Mathematics 204.

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.

308A/B Introduction to Complex Variables, Lect. 3 hrs. *Prerequisite:* Mathematics 200.

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.

309A Advanced Calculus I, Lect. 3 hrs. *Prerequisite:* Mathematics 200 or 220 and 203.

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, systems and an introduction to transformations.

310B Advanced Calculus II, Lect. 3 hrs. *Prerequisite:* Mathematics 309.

Topics covered include some properties of functions defined by integrals: differentiation under the integral sign, tests for 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. Note: Not more than one credit can be given for Mathematics 350, 309A, 310B and the previous class 300.

311A Differential Equations, Lect. 3 hrs. *Prerequisite:* Mathematics 200.

One of the aims 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.

312B Differential Equations, Lect. 3 hrs. *Prerequisite:* Mathematics 311.

The topics discussed are of great importance to any student interested in applied mathematics. Areas include Euclidean spaces, Fourier series, orthogonal polynomials, Sturm-Liouville problems, the classical partial differential equations, and some applications to physics, chemistry and engineering.

321A Introduction to Numerical Analysis, (Same as Computing Science 321A, and previously part of 320R). Lect. 3 hrs. *Prerequisites:* Mathematics 227, 200 (or 220, 250).

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, 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.

***322B Numerical Solutions of Ordinary Differential Equations,** (Same as Computing Science 322B), Lect. 3 hrs. *Prerequisites:* Mathematics 311, 321, 309 (or concurrent registration in 350.)

Initial Value Problems are considered. Various methods, including Runge-Kutta and Predictor-Corrector are examined. The convergence and stability of the numerical methods is investigated and propagated error bounds and estimates sought. Also considered are starting techniques, variable order and/or variable step length strategies and automatic error control. Systems of equations and Stiff equations are discussed. Various methods for solving Boundary Value Problems (e.g. shooting methods and collocation are also discussed). Throughout, the difficulties of implementing various methods are discussed and illustrated via assignments and the use of various computer packages. A brief introduction to the numerical solution of Partial Differential Equations may also be included.

***323B Applied Approximation Theory,** Lect. 3 hrs. *Prerequisites:* Mathematics 321, 309 (or concurrent registration in 350).

A review of orthogonal polynomials and their properties is given, and basic concepts, function norms, and orthogonal systems introduced. The best approximation to a function in the Euclidean norm is obtained. The Weierstrass Approximation Theorem is given and Runge's phenomenon discussed. We also consider characterizing the best approximation in the uniform norm and methods for obtaining this best approximation. Economization of power series is also discussed. Fourier approximation is discussed, and the Fast Fourier Transform is examined. An introduction to Rational and Padé approximation is given and these techniques are compared with polynomial approximation techniques. Throughout, the difficulties of implementing the various methods is discussed and illustrated via assignments.

326B Foundations of Applied Mathematics, Lect. 3 hrs. *Prerequisite:* Mathematics 311.

This one-term class surveys some of the powerful techniques employed by the applied mathematician to handle realistic problems in an analytical fashion. Asymptotic and perturbation methods form the central theme for the class, but some time is spent on differential equation theory and also on the study of a number of successful mathematical models that illustrate the various techniques. *Topics include:* superposition, heatflow, Fourier analysis, Sturm-Liouville Systems, generalized harmonic analysis, dimensional analysis and scaling, regular and singular perturbation theory, asymptotic expansions.

330A Optimization I, Lect. 3 hrs. *Prerequisites:* Mathematics 200, 204.

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.

331B Optimization II, Lect. 3 hrs. *Prerequisite:* Mathematics 330.

This class continues on from the topics in 330. 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.

***332A/B Applied Group Theory,** Lect. 3 hrs. *Prerequisites:* Mathematics 200, 203.

This interdisciplinary half-class is intended for third and fourth-year undergraduate and first-year graduate students in Chemistry, Mathematics and Physics. With some additional reading in Physics, it is equivalent to Physics 448A. Topics include: review of matrices, fundamentals of groups, normal subgroups, homomorphisms, representations, character, orthogonality, symmetry groups in crystallography, role of symmetry groups in quantum physics and chemistry, normal modes and molecular vibrations.

***333B Graph Theory and Combinatorics,** Lect. 3 hrs. *Prerequisites:* Mathematics 200, 204.

The following topics are discussed: elements of graph theory, paths and cycles, Eulerian graphs, trees, planar graphs and the Euler polyhedral formula, Hamiltonian graphs, chromatic numbers, the five-colour theorems; items to be selected from the following topics to suit class: graphs and matrices, graphs and groups, extremal problems, and enumeration problems.

***334A/B Regression and Analysis of Variance,** Lect. 3 hrs. *Prerequisite:* Mathematics 207-208, 203A, or an equivalent knowledge of matrices.

An introduction to regression with emphasis on the practical rather than the theoretical aspects. Topics include: fitting a straight line in matrix terms and fitting of general linear models, analysis of residuals, transformation of data, correlation, multiple and polynomial regression, weighted least squares, indicator variables, selecting the best regression equation, analysis of variance models and an introduction to non-linear least squares. This class makes extensive use of computer packages.

***335A/B Applied Multivariate Analysis,** Lect. 3 hrs. *Prerequisite:* Mathematics 207-208, 203 and 204 or 227.

The class deals with 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 modeling, and hypothesis construction and testing.

***336A Probability,** Lect. 3 hrs. *Prerequisites:* Mathematics 200 and 207-208.

An introduction to the basic concepts of probability to illustrate the great variety of practical applications of probability in science and industry. Topics include: (a) Fundamentals; (b) the classical models: binomial and hypergeometric, the multinomial, the Poisson, exponential, and the uniform distributions; (c) definitions of random variables, independence, functions of random variables, and distributions of sums of independent random variables; (d) conditional events and their probabilities; their uses; (e) laws of large numbers and the Central Limit Theorem. Examples illustrating the applicability of probabilistic formulations are taken from the natural and physical sciences.

***337A/B Stochastic Processes,** Lect. 3 hrs. *Prerequisite:* Mathematics A development of the concepts of: (a) Markov chains and continuous time Markov processes; (b) vector independence and the multivariate normal distribution; (c) stationary time series. Emphasis is on practical applications. The ability to translate from a physical context into the language of a probability model is stressed. This class is a natural sequel to Mathematics 336. Here, the notions of time and space indexing of probability models are introduced, and conditional probability techniques are developed to deal with models of natural phenomena.

***338A/B Sample Survey Methods,** Lect. 3 hrs. *Prerequisite:* Mathematics 207-208 or 106-107 with a grade of B or better.

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-sampling errors and non-respondents, etc.

***339A/B Time Series and Forecasting,** Lect. 3 hrs. *Prerequisite:* Mathematics 207-208.

The analysis of univariate time series data is discussed. Topics include stationarity, transformations, differencing, autocorrelation, autoregressive-moving models, identification, estimation, diagnostic checking and forecasting. The emphasis will be on model building using the approach of Box and Jenkins. Other topics such as exponential smoothing, seasonal adjustment and multivariate models will also be covered.

***346B Intermediate Statistical Theory,** Lect. 3 hrs. *Prerequisites:* Mathematics 207, 208, 336.

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.

350R Intermediate Analysis, Lect. 3 hrs. *Prerequisites:* Mathematics 213, 250.

Mathematics 350 continues the analysis sequence begun in Mathematics 250. *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. Credit can be given for only one of Mathematics 309A, 310B, 328 and 350.

401A/B Introduction to Measure Theory and Integration, Lect. 3 hrs. *Prerequisite:* Mathematics 350.

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 L^P spaces, Fourier series.

402A/B Analytic Function Theory, Lect. 3 hrs. *Prerequisites:* Mathematics 308 and either 310 B or 350.

A second half-class in complex function theory. Topics include: review of analytic complex functions including topological properties of the plane, Möbius mappings, exponential, logarithmic, trigonometric and related functions, integration and the Cauchy theorem. Cauchy's integral formula, residues, harmonic functions, analytic continuation, entire and meromorphic functions, some results of conformal mapping; including the Riemann mapping theorem.

403R Advanced Abstract Algebra, Lect. 3 hrs. *Prerequisite:* Mathematics 303.

This second class in abstract algebra deals with the structure of groups, rings, fields and modules. Topics which may be discussed include Sylow theorem, tensor products, Ext and Tor, modules over a principal ideal domain and Galois Theory.

***405R Introduction to Algebraic Geometry,** Lect. 3 hrs. *Prerequisite:* Mathematics 303.

An introduction to the basic concepts of algebraic geometry.

406R Statistical Inference, Lect. 3 hrs. *Prerequisites:* Mathematics 200 and 336, 346.

This class describes methods which lead to valid inferences from sample data and to calculation of the risk of error in those inferences. Tests of hypothesis are also derived regarding these inferences. Treatment is of a mathematical nature, and the applicability of the results is stressed. The topics include the following: point estimation, consistent, sufficient, efficient and unbiased parameters, method of maximum likelihood, method of least squares, method of moments, method of minimum chi-squares, minimum variance unbiased estimation, interval estimation, minimax and Bayes' estimation, Neyman-Pearson Lemma, composite hypotheses, goodness-of-fit tests, likelihood ratio tests, critical region, locally most powerful tests, non-parametric tests.

***408A/B Statistical Analysis of Spatially Coherent Systems,** Lect. 3 hrs. For Math majors the recommended prerequisite is Mathematics 337. For students in physical science, the natural prerequisite is Physics 4540A.

Techniques for the analysis of modelling of statistical relationships within a spatially coherent system are studied. Practical constraints in the construction of models and of estimation and prediction schemes for natural processes are illustrated with examples from weather and climate studies.

***410A/B Statistical Decision Theory,** Lect. 3 hrs. *Prerequisites:* Mathematics 203, 336, 346, and consent of instructor.

Statistics may be formulated as the science of decision making under uncertainty. Decision theory applies to statistical problems the principle that a statistical procedure should be evaluated by its consequence in various circumstances. The central ideas of statistical decision making models are studied in this class: general decision problems, Bayes and minimax solution of decision problems, admissibility, invariance, sequential decision rules, testing as a decision problem, empirical Bayes rules.

***413A/B Analysis of Algorithms,** Lect. 3 hrs. (same as Computing Science 413). *Prerequisites:* C.S. 369 (with a grade of C- or better). See class description for C.S. 413A/B.

***414A/B Introduction to Functional Analysis,** Lect. 3 hrs. *Prerequisites:* Mathematics 213 and 304.

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, weak* topology and the Alaoglu theorem, the open mapping and closed graph theorems, and consequences and applications.

***415A/B Functional Analysis,** Lect. 3 hrs. *Prerequisite:* Mathematics 414.

Topics include: topological vector spaces, locally convex spaces, normability, function spaces, strict convexity, uniform convexity, reflexive spaces, support functionals, geometry of convex sets and other topics.

***416A/B Operator Theory,** Lect. 3 hrs. *Prerequisites:* Mathematics 401 and 414.

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 Theorem; and the spectral theorem.

***417A/B Introduction to General Topology,** Lect. 3 hrs. *Prerequisite:* Mathematics 304.

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.

***418A/B Introduction to Algebraic Topology,** Lect. 3 hrs. *Prerequisite:* Mathematics 417.

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.

***419A/B Differential Equations,** Lect. 3 hrs. *Prerequisites:* Mathematics 350 (309 and 310) and 203/204 and 213. Mathematics 312 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 Poincareé-Bendixson theorem.

***420A/B Differential Equations - Qualitative Theory,** Lect. 3 hrs. *Prerequisite:* Mathematics 419.

Qualitative theory is concerned with what can be determined about the phase-portrait and the general behaviour of solutions of differential equations even though those solutions are not explicitly exhibited. Topics are selected from Liapunov stability theory, stable and unstable manifolds of singular points and periodic solutions, classification of plane singular points, structural stability, differential equations on manifolds and Hamiltonian systems. Various equations occurring in applications are qualitatively analysed. The precise topics and equations covered depend on the specific interests of the instructor and the students.

***422A/B Introduction to Partial Differential Equations,** Lect. 3 hrs. *Prerequisite:* Mathematics 311.

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.

***423A/B Partial Differential Equations,** Lect. 3 hrs. *Prerequisite:* Mathematics 422.

This class continues the study of partial differential equations begun in 422A. Topics to be covered include: The Rayleigh-Ritz method, Green's Functions, finite difference methods of solution, an introduction to the finite element method.

***427A/B Numerical Software,** Lect. 3 hrs. (same as C.S. 427) *Prerequisite:* C.S. 321 (with a grde of C- or better). See class description for C.S. 427 A/B.

***430A/B Optimal Control Theory and Applications,** Lect. 3 hrs. *Prerequisite:* Consent of instructor.

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.

***431A/B Nonlinear Programming,** Lect. 3 hrs. *Prerequisite:* Consent of Instructor.

A complete treatment of the mathematical theory which underlies the general problem of optimization of a real-valued function subject to a system of constraints. Examples and exercises of an Operations Research nature are used to illustrate the theory. The material studied in this class is a basic prerequisite for understanding and contributing to recent developments in mathematical programming.

***440A/B Modelling in Applied Mathematics I,** Lect. 3 hrs. *Prerequisites:* Mathematics 321, 310 or 350, 311 and 330.

It is intended that this class be team taught by those teaching 311 and 330. Problems from the domain of these prerequisites are examined in some detail. For each problem, the instructor describes the problem in context, abstracts it so that a model can be obtained, supervises the implementation of the model by the students and then discusses the results and criticizes the model in the context of the original problem. The choice of problems varies from year to year depending upon the instructors and their current interests. The importance of obtaining the model from the original problem and interpreting the results obtained in the context of the original problem is emphasized.

***441A/B Modelling in Applied Mathematics II,** Lect. 3 hrs. *Prerequisites:* Mathematics 310 or 350, 321, 326, and 337.

It is intended that this class be team taught by those teaching Mathematics 326 and 337. Problems from the domain of the prerequisites are examined in some detail, using the same approach as in Mathematics 440.

***462A/B Data Analysis,** Lect. 3 hrs. *Prerequisite:* Statistical techniques useful as background for this class would include any techniques covered in Mathematics 207-208, 334, 335, 336, 337, 338 or 339 although it is not necessary to have taken all of these prerequisites. Admission to the class is by consent of the instructor.

A problem-oriented approach to statistical analysis. The problems discussed are based on real life data. Students are encouraged to develop novel approaches for data analysis problems of case studies. Some general techniques which arise in non traditional data analysis are presented in this class. Students are required to make a formal presentation of their work, which may involve data analysis of the case studies, or it may be mathematical development motivated by the case studies.

***466A/B Automata and Computability.** (Same as Computing Science 466.) Lect. 3 hrs. *Prerequisites:* Computer Science 141; a 300 level Mathematics class such as 303.

For description see Computing Science 466.

8700 (non-credit) Co-op Seminar

8891 Co-op Work Term I

8892 Co-op Work Term II

8893 Co-op Work Term III

8894 Co-op Work Term IV

Mediaeval Studies

The period commonly called the Middle Ages (approximately A.D. 400-1500) offers a unique opportunity to study Western culture as a whole. Indeed, any attempt to study a part of this period in isolation leads to a conviction that such an investigation can never be satisfying and that the walls between disciplines must be broken down and the literature seen in relation to the philosophy, the philosophy in relation to the history, and the history in relation to the languages. No matter what the vernacular tongue of any geographical area, there was one common language throughout Europe and one church, and the study of these leads inevitably to a consideration of paleography, art, architecture and music.

The field is a very large one and could become a fascinating and rewarding area for a certain type of student - the one who likes to immerse himself in his work and who feels that university studies need not involve strong knowledge in separate pigeon-holes because his language course has nothing in common with the social science he is required to take.

The regulations for the Honours degree permit a structured programme to be set up in Mediaeval Studies which cuts across traditional departmental lines while allowing considerable freedom in choice of classes.

The professors currently involved in this programme are: R. Crouse, J. Doull, E. Segelberg (Classics); R. Dawson, H. Morgan (English); H. Runte (French); R. Haines (History); J. Aitchison (Political Science). A student who is interested in entering the programme in Mediaeval Studies should speak to one of these faculty members, who will then refer him to the Administrative Committee for the planning of his course.

Structure

The Honours degree in Mediaeval Studies must have a major field consisting of 9 classes, selected from those with Mediaeval Studies numbers, which will include at least one in each of: a literature, history, philosophy and Latin. Other classes will depend on the individual student's interests, but all four disciplines must be represented. The minor field may be varied to suit the taste of the student: he may wish to continue into later periods in his favourite discipline or he may wish to acquire another language to help him in his work. No class in the minor field may be from the Mediaeval Studies group. The four classes not in the major field may be widely scattered: one or more of them may be 100-level prerequisites which may be necessary for later mediaeval work, e.g., introductory German or Latin or Political Science.

Some sample programmes which might be followed are:

Literary: English. Major: Med. Stud. 201, 202, 203, 204, 211, 301, 302, 401, 261. Minor: 2 classes in English, possibly English 251 and 252. Four additional classes: possibly Philosophy in Literature (Phil. 270), History of England (Hist. 2100), German for Beginners (German 100), and Intermediate German (German 200).

Literary: non-English. Major: Med. Stud. 211, 212, 214, 204, 301, 303, 210, 402. Minor: 2 additional classes, possibly in French or German. Four additional classes: possibly Latin 100, Philosophy 100, plus another Latin and another Philosophy.

Historical: Major: Med. Stud. 301, 302, 303, 304, 311, 401, 414, 202, 201. Minor: History 2100. Four additional classes: possibly introductory and intermediate Latin and two French.

Philosophical: Major: Med. Stud. 401, 402, 403, 414, 301, 302, 204, 211, 201. Minor: possibly two classes in the earlier or later history of philosophy. Four additional classes.

Classes

The classes available from which a mediaeval grouping may be formed are given below. Some of them are on an *ad hoc* basis, depending on the needs of students in any given year. Staffing problems may require the omission of certain classes from time to time: students are referred to the Mediaeval studies prospectus at the time of registration. The numbering of the classes reflects subject and department, rather than order of difficulty or of priority.

201 History of the English Language (English 202)

202 Old English (English 253)

203 Mediaeval Literature (English 218)

204 Middle English (English 351)

210 Mediaeval French Literature (French 3300A)

211 History of the French Language (French 4000)

212 French Mediaeval Literature (French 4300A/4301B)

214 Arthurian Romances (Comparative Literature 214)

301 Mediaeval Life and Thought (History 1990/5)

302 Mediaeval Europe (History 2000)

303 Mediaeval Civilization (History 3000)

304 Roman History: The Cultural History of the Roman World (Classics 223)

306 The Mediaeval Church (History 3020)

311 Paleography (History 4010)

401 Mediaeval Philosophy (Classics/Philosophy 338)

402 Latin Philosophical Texts (Latin 204)

403 Seminar on the Philosophy of the Church Fathers (Classics 440/570)

404 Western Religious Experience (Religion 201)

Meteorology

A one-year diploma programme in meteorology is available to qualified students with a general B.Sc. degree in Physics or related subjects. For details, see under **'Physics'**.

Microbiology

Head of Department
K.R. Rozee

Professor Emeritus
C.W. van Rooyen, D.Sc. (Edin.), M.D., Ch.B., F.R.C.P., F.R.C.P.(C), F.R.C. Path (Lond.) - (Virology)

Professors
K.B. Easterbrook, Ph.D. (A.N.U.) - (Structure and Function in Microorganisms; Bacterial Spines)
J.A. Embil, M.D. (Havana), Ph.D. (Dal.) - *Pediatrics* (Clinical Virology; Herpes, Cytomegalovirus)
L.S. Kind, Ph.D. (Yale) - (Immunology, Reaginic Antibody Synthesis)
S.H.S. Lee, Ph.D. (Dal.) - (Virology; Interferon)
D.E. Mahony, Ph.D. (McG.) - (Bacteriology; Bacteriocins and L-Forms of Clostridia)
K.R. Rozee, Ph.D. (Dal.), Dip. Bact. (Tor.) - (Viral Pathogenesis; Epidemiology)
C.E. van Rooyen, D.Sc. (Edin.), M.D., Ch.B., F.R.C.P., F.R.C.P.(C), F.R.C. Path. (Lond.) - (Virology)

Associate Professors
T. Ghose, Ph.D. (Calc.) - *Pathology* (Immunopathology; Cancer Immunotherapy)
G.C. Johnston, Ph.D. (York) - *Graduate Studies Coordinator* (Genetic Control of Cell Division)
E.S. McFarlane, Ph.D. (Dal.) - (Microbial Chemistry; Cancer Viruses).
D.B. Stoltz, Ph.D. (McM.) - *Undergraduate Studies Coordinator* (Biology of Parasitic Insects; Insect Virology)
C. Stuttard, Ph.D. (Dublin) - (Microbial Genetics)

Assistant Professors
R.S. Martin, Ph.D. (Giessen), Dip.Bact. (Lond.) - Clinical Bacteriology
R. Rajaraman, Ph.D. (Dal.) - (Cancer Cell Biology, Fibronectin)

Lecturer
G. Faulkner, Ph.D. (Dal.) - Ultrastructure

Postdoctoral Fellow
C.L.Y. Lee, Ph.D. (Dal.)

The field of Microbiology includes the activities of viruses and cellular organisms such as bacteria, fungi, protozoa and algae. The Microbiology programme is designed to provide the student with an understanding of microorganisms - their structure, function, diversity, and contribution to the biosphere, and attempts to provide a basic training which may serve as preparation for graduate or professional work in all fields of microbiology. The Department of Microbiology is located in the Sir Charles Tupper Medical Building and offers microbiology programmes in the Faculties of Medicine, Health Professions, Arts and Science and Graduate Studies.

Degree Programmes

The Department, in conjunction with the Biology Department, offers both a coordinated 2-year programme and a combined honours programme in Microbiology. These programmes are designed for students entering their second year of study and lead, respectively, to the *general* B.Sc. and the *honours* B.Sc. degree. Combined Biology/Microbiology honours students doing thesis work in the Microbiology Department participate with graduate students in a special seminar programme in lieu of the Biology Department Honours Seminar series. Where possible, such students must attend the weekly Microbiology Department seminar program (Mondays, 1-2 p.m.). Students intending to specialize in microbiology are urged to consult the departments concerned at their earliest opportunity; current faculty advisers are: D.B. Stoltz (Microbiology Department) and G.S. Hicks (Biology Department).

The Department has recently developed a proposal for a special honours programme in Microbiology; this is designed to commence in year II of a 4-year programme. It is probable that the proposal will be approved for implementation well in advance of the 1984-85 academic year. Interested students are encouraged to consult Dr. Stoltz for further details.

As a general rule, students have previously taken a comprehensive class in introductory biology (Biology 1000) prior to embarking upon any programme in Microbiology. It should also be noted regarding the class offerings listed below that Microbiology 2100 is a prerequisite for all classes given in this Department except Microbiology 3020 and 3023A. Most classes listed here are cross-listed with the Biology Department, which means that students can register in 2100, e.g., as either *Microbiology* 2100 or *Biology* 2100.

Classes Offered

N.B. Students wishing to do advanced work in Microbiology are advised that in some instances a grade of B- or better in specific 2-3000 level courses may be specified as prerequisite to particular 3-4000 level courses. Some classes have a limited enrollment of 30 or less. Consult with relevant faculty or course coordinators.

2100A/B Introductory Microbiology, Lect. 2 hrs.; Labs. 3 hrs.; D.B. Stoltz (course coordinator), R.G. Brown, G.C. Johnston, J.A. Novitsky, C. Stuttard. *Prerequisite:* Biology 1000.

An introduction to the basic concepts of microbiology through lectures, laboratory sessions, and demonstrations. Topics include the structure, ecology, growth, genetics and physiology of microorganisms, as well as basic immunology. This course is a prerequisite for all the other microbiology classes listed below, with the exception of 3020 and 3023A. For the convenience of all concerned, no student will be registered into 2100 after the first laboratory session. It should be noted that students wishing to acquire extra experience in microbiology could take 2100A followed by Biology 3111B, Biology 3120B, or Microbiology 3118B in the same academic year.

3020 General Microbiology, Lect. 2 hrs.; Lab. 3 hrs. S.H.S. Lee. *Prerequisite:* Biology 1000 or permission of the instructor.

Intended to provide a general knowledge of microbiology at an introductory level for students in the Health Sciences, this class is *not* considered to be part of the Biology/Microbiology combined honours programme. The lecture topics are divided into three sections. The first introduces the microbial world, the basic concepts and facts of structure and function, growth, genetics, and immunology. The second comprises a systematic survey of the medically important groups of microorganisms, with special emphasis on host-parasite relationships. The third section is concerned with the application of microbiology in health sciences, industry and ecology. Laboratory work is designed to complement the lecture materials and to provide experience in the isolation, identification, cultivation and control of microorganisms.

3023A Biological Ultrastructure, Lect. 2 hrs.; Labs. 3 hrs.; K.B. Easterbrook, D.B. Stoltz, M. Willison (course coordinator). *Prerequisite:* Biology 2015, or 2020, or 2100.

Designed to teach fundamental aspects of the architecture of biological entities (including viruses, bacteria, protists, fungi, plants and animals) at the "ultrastructural" level. Ultrastructure is considered to include both intracellular and extracellular organization in the size range lying between macromolecules and whole cells. The relationship between structure and function is a recurrent theme, and special emphasis is placed on selected organisms of general importance. Laboratories are designed primarily to familiarize students with the interpretation of micrographs. Techniques used in ultrastructure research are explained and demonstrated. Students wishing to be trained in particular techniques should subsequently register in Biology/Microbiology 4024B.

3033A Microbial Genetics, Lect. 2 hrs.; Lab./tutorial 3 hrs.; C. Stuttard and G.C. Johnston. *Prerequisites:* Microbiology 2100 and Biology 2030.

The study of heredity in microorganisms - especially bacteria and their viruses. Although there is some discussion of the chemical basis of mutation, DNA replication, recombination and repair, the main emphasis is on mechanisms of gene transfer in microbes, gene mapping and the use of microbes as model systems for the study of general genetic phenomena including plasmids and transposable DNA.

3114A Virology, Lect. 2 hrs.; Labs./tutorials 3 hrs.; E.S. McFarlane (course coordinator). *Prerequisite:* 2100.

Provides an introduction to Virology, and to some extent discusses all kinds of viruses - animal, bacterial, insect and plant. Important concepts relating to the isolation, biophysical characterization, classification and replication of viruses are considered.

3115A Immunology, Lect. 2 hrs.; Lab. 3 hrs.; L.S. Kind. *Prerequisite:* 2100 or permission of the instructor.

The structure, synthesis, regulation of production, detection and measurement of antibodies. Also to be discussed are topics in the fields of transplantation, tolerance, hypersensitivity, tumour immunology, complement and the genetics of the immune response.

3118B Systematic Bacteriology, Lect. 2 hrs.; Labs. 3 hrs.; D.E. Mahony. *Prerequisite:* Grade of B- or better in 2100. Not offered in 1984.

A survey of several bacterial groups with particular attention devoted to bacteria of medical interest. Attention is given to those criteria which are regarded as important in the classification of bacteria, and to the techniques used to identify particular species.

4022A/B Microbial Ultrastructure Project, K.B. Easterbrook, D.B. Stoltz, G.T. Faulkner. *Prerequisites:* 3023A and 4024B.

A research project using one or more of the skills acquired in Biology/Microbiology 4024B, selected by the student in consultation with the instructor.

4024B Microscopy, Lect. 2 hrs.; Labs. 3 hrs.; K.B. Easterbrook, D.B. Stoltz, G.T. Faulkner and M. Willison (course coordinator). *Prerequisite:* A grade of B- or better in 3023A.

This class is a corollary to Biology 3023A. Instead of considering biological ultrastructure, the class deals with some of the principal methods involved in the study of cell structure. Both light and electron microscopy, including ancillary techniques, are considered in depth. The importance of a proper understanding of the physical and chemical principles governing technical procedures is emphasized. During laboratory periods students have the opportunity to practise, or to watch demonstrations of, some of the techniques covered in the lectures.

4033B Advanced Microbial Genetics, Lect. 2 hrs.; C. Stuttard, G.C. Johnston. *Prerequisite:* Microbiology/Biology 3033A.

Selected topics in microbial and molecular genetics including plasmids, gene cloning, eukaryotic gene organization, specialized gene mapping techniques, genetics of industrial microorganisms.

4025R The Mammalian Cell as a Microorganism, Lect. 2 hrs.; Lab. 3 hrs.; R. Rajaraman. *Prerequisite:* Biol. 2020, or 2015 and 2030, or permission of instructor.

An in-depth analysis of current research in cellular and molecular biology in relation to the

mammalian cell viewed as a microorganism. Various aspects of experimental cell biology including life span, cell cycle, cytogenetics, mutagenesis, somatic cell genetics, immunology by cell culture, radiation cell biology, induction of cancer by radiation, viruses, and chemicals, and its prevention, genetics and cytogenetics of cancer, are discussed. Laboratory exercises include selected cell culture methods, and other techniques of current interest.

4114B Topics in Virology, Lect. 2 hrs.; Labs. 3 hrs.; E.S. McFarlane. *Prerequisite:* 3114A. Grade of B- or better in 3114A.

A class for advanced students in virology. Several aspects of virology are discussed in detail; e.g., virus structure and replication, viruses and cancer, viral genetics, virus-cell interaction, etc.

4115B Topics in Immunology, Lect. 2 hrs.; L.S. Kind. *Prerequisite:* 3115A.

Students read and discuss articles from the current immunological literature. While all major areas of immunology are included, the emphasis is on topics previously studied in 3115A.

4700 Special Topics

Consult department.

4900 Honours Research and Thesis.

Music

Chairman of Department
R.D. Byham

Professor
W.H. Kemp, Mus.Bac., Mus.M. (Tor.), A.M. (Harv.), D.Phil. (Oxon.)

Associate Professors
R.D. Byham, B.M., M.M. (Ill. Wesleyan), (History and Keyboard Skills)
P. Djokic, B.Mus., M.Mus. (Juilliard) (Violin)
D.M. Farrell, B.A. (St. Norbert Coll.), M.Mus., Ph.D. (Wisc.), (Theory)
E. Gonnella-Welch, Dipl. of Art (Dundee Coll. of Art), L.R.A.M. (Roy. Acad. Lond.) (Voice)
J. Morris, B.A. (DePauw), (Voice)
P.A. Perron, B.Mus. (McG.), M.Mus.Ed. (Holy Names College) (Music Education)
L. Stodola, B.Mus. (Chic.), M.Mus. (Julliard) (Piano)
J.S. Tittle, B.S. (Kent State), M.M., D.M.A. (Wisc.), (Theory and Composition)
W. Valleau, (Cello)
C. van Feggelen, (Guitar and Lute)
D.F. Wilson, B.F.A. (Carn. Inst. Tech.), M.Mus. (Roch.), Ph.D. (Casc. W.R.), (History)

Assistant Professor
D.P. Schroeder, A.Mus., B.A., M.A. (Western Ontario), Ph.D. (Cantab.) (Theory & History)

Senior Instructor
T. Zonneveld, Dipl. (Teach.), Dipl. (School Mus.), Dipl. (Performance), (Royal Conservatory, The Hague), (Piano)

Part-Time Faculty
J. Armitage
N. Babineau

Music Education Lecturers
H. Schoales
J. Wood

Applied Skills Instructors
E. DuBois (flute)
P. Evans (recorder)
J. Faraday (percussion)
F. Graham (organ)
M. Graham (harpsichord)
A Krabill (oboe)
D. Krabill (bassoon)
D. Palmer (saxophone)
J. Rapson (clarinet)
J. Stern (trumpet)

Special Lecturers and Musicians
D. Palmer
W. Tritt

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 and involvement.

In the Bachelor of Music Programme, the Department offers training to the prospective professional musician: performer, composer, theorist, historian or critic. Future teachers instructing in the elementary and secondary school classroom are provided with methods, skills and field experience in the Bachelor of Music Education Programme. In our society today there are many vocations in which a working knowledge of various aspects of music is a desirable part: librarianship, media programming and production, arts management, recreational and therapeutic work, to name only a few. A carefully chosen B.A. (General) or combined Honours programme could furnish a basic equipment for further studies in preparation for such professions. The truly contemporary listener, too, must acquire style-specific tools, if there is to be an informed response to the musical experience.

Thus the University's Music Department must be ready to serve many needs within a general standard of excellence. Crafts and skills, history and practice must be presented in an equilibrium flexible enough to be useful to each student's identity as a musical person.

Degree Programmes in Music

Admission

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

a) satisfy the requirements for admission to the Faculty of Arts and Science
b) demonstrate their proficiency as instrumental or vocal performers in an audition-interview
c) demonstrate knowledge of the basic rudiments of music theory (equivalent to Grade II Theory of the Royal Conservatory of Music of Toronto) in a written diagnostic test, to be arranged to coincide with the audition-interview.

Applicants failing their written rudiments test would be required to take preparatory lessons in music theory before entering a university music programme.

When making application for admission to the University, prospective music students should request the supplementary application form for the Department of Music.

Applications to the Department should be received by the end of April; audition procedures should be completed by the end of May to ensure admission and scholarship consideration.

Students wishing to transfer from another institution into the Second or Third Year of their chosen Music programme must take validation examinations in history, theory, aural and keyboard skills, and their applied major instrument before transfer of credits can be considered. Failure to pass an examination will necessitate enrollment in the appropriate First or Second Year class.

Bachelor of Music (B.Mus.)

The *B.Mus.* is a four-year programme with sixteen out of twenty classes in music, plus graduation requirement. Upon successful completion of the second year, students may choose to concentrate in performance, music history and literature, or composition.

Common Curriculum

First Year
1100R Applied Skills
1300R Survey of Music Literature
1200R Theory I
1270C Aural Perception I
1271C Keyboard Skills I
Arts and Science Elective, one full credit (Writing Course Elective)

Second Year
2100R Applied Skills
2300R History of Music I
2200R Theory II
2270C Aural Perception II
2271C Keyboard Skills II
Arts and Science Elective, one full credit

Concentration in Performance

Third Year
3100R Applied Skills
3300R History of Music II
3280C Counterpoint
3282C Orchestration
3640A Conducting
Music Elective, one half credit
Arts and Science Elective, one full credit

Fourth Year
4100R Applied Skills
4300R Contemporary Scene
4280C Advanced Harmony and Counterpoint
4281C Form and Analysis
Music Elective, one full credit
Arts and Science Elective, one full credit

Concentration in Composition

Third Year
3100R Applied Skills
3300R History of Music II
3280C Counterpoint
3282C Orchestration
3210R Composition
Arts and Science Elective, one full credit

Fourth Year
4300R Contemporary Scene
4280C Advanced Harmony and Counterpoint
4281C Form and Analysis
4210R Composition
3460A Conducting
Music Elective, one half credit
Arts and Science Elective, one full credit

Concentration in History and Literature

Third Year
3100R Applied Skills
3300R History of Music
3280C Counterpoint
3282C Orchestration
3310R Music in Canada
Arts and Science Elective, one full credit

Fourth Year
4300R Contemporary Scene
4280C Advanced Harmony and Counterpoint
4281C Form and Analysis
4368A & 4369B Special Studies
3460A Conducting
Music Elective, one half credit
Arts and Science Elective, one full credit

Standards:

1. a) All students wishing to enter the third year of the B.Mus. programme must successfully complete all second year music classes and achieve an overall average of B- in the music classes of the first and second years, including a minimum standing of C in both Music 1200 and 2200 and a minimum of B- in Music 2100.
b) Students wishing to enter the concentration in performance must achieve an average of B+ in Music 1100 and 2100; in history and literature, an average of B+ in Music 1300 and 2300, and demonstrate acceptable writing ability; in composition, submit one or more original pieces for assessment by the composition faculty.
2. a) Students in the B.Mus. programme must maintain a minimum standing of B- in each of the music classes of the third and fourth years.
b) 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.
c) Students must achieve a minimum standing of C in each of their Arts and Science electives.

Bachelor of Music Education (B.Mus.Ed.)

The *B.Mus.Ed.* programmes combine instrumental or vocal instruction; theoreticaly, aural and keyboard skills; historical knowledge and the methods and repertoires needed by the music teacher in the elementary and/or secondary school classroom. Observation and field experience in classroom settings constitute an important part of the programmes. Students will choose between curricula in Classroom Music and Instrumental Music.

Changes in the teacher certification requirements in the Province of Nova Scotia will result in changes in the programmes as outlined below and will be in effect prior to the beginning of the 1984-85 academic year. Students should consult the Department of Music for current programme requirements.

Common Curriculum

First Year
1100R Applied Skills
1300R Survey of Music Literature
1200R Theory I
1270C Aural Perception
1271C Keyboard Skills
Arts and Science Elective, one full credit (Writing Course Elective)

Second Year
2100R Applied Skills
2200R Theory II
2270C Aural Perception II
2271C Keyboard Skills II
2300R History of Music I
Education 4340R Developmental Psychology

Classroom Music

Third Year
3101R Applied Skills
3270C Aural Perception III
3400R Elementary Methods
3470A Conducting
3470C Field Experience
3461B Advanced Choral Technique
3300R History of Music II

Fourth Year
4101R Applied Skills
4400A Secondary Methods
4470C Field Experience
4482C Choral Arranging
One-half credit elective in Music Education
4300R Contemporary Scene
The equivalent of one full-credit elective in Music or Music Education.

Instrumental Music

Third Year
3101R Applied Skills
3282C Orchestration
3300R History of Music II
Either 3480 Band Instruments, *or*
3481C String Instruments

3460A Conducting
3400R Elementary Methods
3470C Elementary Field Experience

Fourth Year
4101R Applied Skills
4300R Contemporary Scene
4400A Secondary Classroom Teaching Methods
4470C Secondary Classroom Field Experience
4480C Band Instruments II
Either 4481C Band Methods and Field Experience, *or*
4483C String Methods and Field Experience
One half-credit elective in Music Education
The equivalent of one full-credit elective in Music or Music Education.

Standards
1. All students wishing to enter the third year of the B.Mus.Ed. programme must successfully complete all second year music classes and achieve an overall average of B- in the music classes of the first and second years, including a minimum standing of C in both Music 1200 and 2200, and a minimum of B- in Music 2100.
2. See *Arts and Science General Faculty Regulations (Item 3).*

Other Requirements, B.Mus. and B.Mus.Ed.:
1. All students enrolled in Applied Skills classes perform before a jury at the conclusion of the academic year; students enrolled at the 1000 level also must perform a jury exam at the end of the first term.
2. With special permission, a student in the B.Mus.Ed. programme may give a graduation recital instead of a final jury exam.
3. With the permission of the Department, a student in the B.Mus.Ed. programme may enroll in additional Education classes to the maximum equivalent of one full credit elective.

Bachelor of Arts (Major in Music)

The *B.A. (General)* with a major in music is a three year course, subject to the regulations described in the section *Arts and Science: General Faculty Regulations (Item 3)* and *Degree Programmes (Item 5).* Students are required to complete Music 1100R, 1300R, 1200R, 1270C and 1271C before entering the third year. Other classes, to a maximum total of 6 full credit classes, may be selected in consultation with the Department to suit a student's individual needs and interests. Music Education classes are not considered applicable to this degree. Students in the B.A. (General) programme enrolled in Applied Skills courses are required to pass jury examinations.

Students wishing to transfer from another institution into this course may be required to enroll in an Applied Skills Class at the First-Year level, depending upon the standard of their performance proficiency demonstrated in the audition-interview.

Classes for Non-Majors

Classes offered as arts electives for non-majors are as follows:

1000R Man and His Music
2007R Guitar and Lute
2088C Electronic Composition
2089C Experimental Music
2010R Music of Non-Western Cultures
2011R History of Opera
2012R Music and Psychology
2013R The Evolution of Jazz
2014R The Comtemporary Scene

Classes Offered

A. History and Literature of Music

1) History:

1300 Survey of Music Literature, Lect. 3 hrs.; D. Wilson. *Prerequisite:* A basic knowledge of musical notation and terminology equivalent to Grade II Conservatory.

An introduction to the styles and forms of Western music, from Gregorian Chant to the present.

2300 History of Music I, Lect. 3 hrs.; D. Wilson. *Prerequisite:* 1200, 1300.

A detailed study of the early development of Western music, Medieval, Renaissance and Baroque, with emphasis on the development of style and performance practices. Introduction to research techniques.

3300 History of Music II, Lect. 3 hrs.; D. Schroeder. *Prerequisite:* 2300, or permission of the Department.

A study of the history, literature, craft and practice of music after 1750, the age of tonality; Classicism and Romanticism in music.

***3310 Music in Canada,** Lect. 3 hrs. *Prerequisite:* 1300, or permission of the Department.

An historical survey of music in Canada with emphasis on the socio-economic factors essential to the successful transplantation and growth of European musical culture in Canada. The class gives practical experience in research skills as they pertain to the specialized area of Canadian music. Students must research and compose reports on both historical and contemporary topics.

***3311 History of Opera,** Lect. 3 hrs.; W.H. Kemp. *Prerequisite:* permission of the Department.

A 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.

***2310 Music in non-Western Cultures,** Lect. 3 hrs. *Prerequisite:* permission of the Department.

The functions and styles of traditional musics outside the Western traditional repertoire of composed music.

***3312 Music and Psychology,** Lect. 3 hrs.; W.H. Kemp. *Prerequisite:* permission of the Department.

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 working knowledge of musical notation is a prerequisite to this study; no previous classes in Psychology are necessary.

***3313 The Evolution of Jazz,** Lect. 3 hrs.; D. Palmer.

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.

4300 The Contemporary Scene, Lect. 3 hrs.; S. Tittle. *Prerequisite:* permission of the Department and an interview with the instructor.

The main trends in 20th century "serious" music, with particular emphasis on "new" musical practices.

4368A & 4369B Special Studies, *Prerequisites:* 2300 and 3300.

Individuallly directed research and writing under the supervision of an appropriate member of the Department.

4399 Graduation Thesis

2) Literature Studies

The purpose of these classes is to enable study in depth of the history and repertoire of a specific performance idiom. During the classes, the student is encouraged to apply personal skill as a performer. Each class is 2 hours, with permission of the Department as a prerequisite.

***3350A Keyboard Music to 1750,** Lect. 3 hrs., R. Byham.

***3351B Piano Literature, 19th and 20th Centuries,** Lect. 3 hrs., R. Byham.

***3352A Chamber Music, to 1800,** Lect. 3 hrs.

***3353B Chamber Music, 19th and 20th Centuries,** Lect 3 hrs.

***4370C The Organ and its Literature**

B. Theory and Composition

1) Theory and Related Skills

1200 Music Theory I, Lect. 3 hrs.; D.M. Farrell. *Prerequisites:* permission of the Department; a basic knowledge of music notation and terminology equivalent to Grade II Conservatory. *Normal Co-requisites:* 1270C, 1271C.

A thorough knowledge of musical rudiments is presumed. The class begins with 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 contrapuntal dimensions. In the second term, there is a concentration upon a complete grounding in the traditional four-part writing skills. This culminates in the study of the dominant seventh and elementary modulation.

1270C Aural Perception I, Lab. 3 hrs.; D.M. Farrell. *Prerequisite:* permission of Department. *Normal Co-requisites:* 1200R, 1271C.

A class designed to correlate with 1200 and 1271C. Melodic, Harmonic, Rhythmic, Textural and

Stylistic factors are visualized, performed and dictated systematically. Labwork in ear-training and sight-singing is done three times per week. Each student is a member of a small working section.

1271C Keyboard Skills I, Lab. 2 hrs.; R. Byham. *Prerequisite:* permission of Department; *Normal Co-requisites:* 1200R, 1270C.

The development of basic skills in sight reading, score reading and harmonized accompaniment at the keyboard.

2200 Music Theory II, Lect. 3 hrs., D. Schroeder. *Prerequisites:* 1200, 1270C, 1271C.

A continuation of 1200, covering the study of a complex modulation, altered chords and chromatic harmony. Emphasis is placed upon concepts of functional tonality by means of both written exercises in four-part harmony and analysis of Classic and Romantic compositions.

2270C Aural Perception II, Lab. 2 hrs.; D. Schroeder. *Prerequisites:* 1200, 1270C, 1271C.

This class provides further practice in melodic and harmonic dictation and sight-singing; it correlates with 2200. A special component deals with solmization skills in sight reading.

2271C Keyboard Skills II, Lab. 2 hrs.; R. Byham. *Prerequisites:* 1200, 1270C, 1271C.

A continuation of 1271C.

3270C Aural Perception III, Lab. 2 hrs.; P. Perron. *Prerequisites:* 2200, 2270C, 2271C.

Advanced sight-singing and dictation. Singing music of all periods on solfa syllables and letter names with emphasis on contemporary music. Dictation of modulating excerpts in four-part chorales. Chromaticism, modality, whole-tone and contemporary music are studied along with musical examples of more rhythmic complexity. Also included: singing and dictation of atonal compositions, advanced chords, sing and play exercises.

3280C Counterpoint, Lect. 2 hrs.; D. Farrell. *Prerequisite:* .

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.

3282C Orchestration, Lect. 2 hrs.; S. Tittle. *Prerequisite:* 2200.

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.

4280C Advanced Harmony and Counterpoint, Lect. 2 hrs.; W. Kemp. *Prerequisites:* 2200 and 3280C.

The application of acquired harmonic and contrapuntal technique to various instrumental and vocal textures and forms; chorale prelude and fugue.

4281C Form and Analysis, Lect. 2 hrs.; W. Kemp. *Prerequisites:* 2200, 3280C, 3300.

Analytic study of the form and content of selected compositions in various styles and idioms.

2) Composition

3210, 4210 Composition I, II, S. Tittle. *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.

Particular works are analysed to serve as a springboard for original composition by the student. Students' works are evaluated in small group discussions and in individual tutorial sessions.

2088C Fundamentals of Electronic Composition, Lab. 2 hrs.; S. Tittle. *Prerequisite:* personal interview with instructor. *Normal Co-requisite:* 2089C.

Introduction to the Experimental Sound Studio. Recording, mixing and tape manipulation techniques; analysis and composition of tape music. Voltage control concepts, synthesizer theory and practice; composition and live performance with electronics.

2089C Experimental Music, Lab. 2 hrs.; S. Tittle. *Prerequisite:* personal interview with instructor. *Normal Co-requisite:* 2088C.

Historical background and aural analysis. Group improvisation and composition with both Studio and personal resources. Design and execution of live performance situations, which may include verbal, visual and other theatrical elements.

***4271C Advanced Improvisation and Keyboard Harmony.** *Prerequisite:* permission of the Department and an interview with the instructor.

Intended for keyboard students, the class involves the development of skills in transposition, score reading, and continuo realization.

4282C Choral Arranging, Lect. 2 hrs.; D. Farrell.

See **4482C,** *Music Education.*

C. Performance

Note: 1. 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.

2. In addition to the one-hour lesson, and appropriate to the idiom, group instruction in technique and repertoire may be required part of all sequences of Applied Skills classes.

1100, 2100, 3100, 3101, 4100, 4101, Applied Skills

Offered in all band and orchestral instruments, guitar and lute, piano, organ, harpsichord, recorder, voice. Normally all students receive one hour weekly individual lesson in their major performance idiom.

3460A Conducting, Lab. 3 hrs.; P. Djokic. *Prerequisites:* 2200R, 2270C, 2271C.

An introduction to the fundamentals of conducting.

3461B Advanced Choral Techniques, Lab. 3 hrs.; M. Graham. *Prerequisites:* Music 2200R, 2270C, 2271C, 3460A.

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.

D. Music Education

Prerequisites for all classes: permission of the Department, and an interview with the designated member of the Music Education faculty.

1) Core Classes

3400 Elementary Classroom Teaching Methods, Lect. 3 hrs.; P. Perron.

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.

3470C Elementary Classroom Field Experience, P. Perron.

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.

3480C Band Instruments, Lab. 2 hrs.; staff.

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.

3481C String Instruments, Lab. 2 hrs.; staff.

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.

4400A Secondary Classroom Teaching Methods, Lect. 3 hrs.; P. Perron.

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.

4470C Secondary Classroom Field Experience, P. Perron.

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.

4480C Band Instruments II, Lab. 2 hrs.; staff.

A continuation of 3480C.

4481C Band Methods and Field Experience, Lab. 2 hrs.; J. Armitage. *Prerequisite:* 3460A.

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.

4483C String Methods and Field Experience, Lab. 2 hrs.; N. Babineau. *Prerequisites:* 3460A; 3481C or permission.

A survey of literature and string methods for schools and purchase and maintenance of string instruments; supervised string teaching practice in the school setting.

2) Electives

4461B Classroom and Recreational Instruments, Lab. 2 hrs.; J. Wood.

Basic techniques, methods, maintenance and literature of various portable instruments suitable to their creative application in school and recreational settings.

4462A Guitar in the Classroom, Lab. 2 hrs.; C. van Feggelen.

Introductory guitar instruction including vocal/choral accompanying methods and techniques

for the school classroom setting, tablature reading and finger-style playing, development of skills in a variety of accompaniment and rhythmic figurations. Practical applications will be available in Music 3470/4470C.

4471C 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.

***4473C Contemporary Music in the Classroom,** Lect. 2 hrs.; A. Tilley.

A study of certain specific 20th-century works and trends; active music making in the classroom; survey of the literature related to the use of contemporary music materials in the classroom (Schafer, Self, Paynter, etc.).

***4474C The Recorder in the Classroom,** Lab. 2 hrs.; P. Evans.

Technique, methods, and literature of the recorder family as applied in the school setting.

4482C Choral Arranging, Lect. 2 hrs.; D. Farrell. *Prerequisite:* 3282C.

Arranging for the school choral ensemble.

Classes Available to Non-Majors

1000 Man and His Music, Lect. 2 hrs.; W.H. Kemp.

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. 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.

2007 Guitar and Lute, Class 2 hrs.; ensemble; C. van Feggelen. *Prerequisite:* personal interview with instructor.

For students with a serious interest in classical guitar playing and for whom it is not possible to provide individual instruction. Basic playing technique and the history of fretted instruments.

2008 Modern Guitar, Lab 2 hrs.; C. van Feggelen. *Prerequisites:* interview with instructor.

A class for students with a serious interest in preparing for studio guitar playing and including jazz, folk, rock and accompanying idioms. Class instruction and ensemble playing in improvisation, score reading, chording and arranging.

The following classes, previously described, are also available:

2088C = 2288C Electronic Composition
2089C = 2289C Experimental Music
*2010 = 2310 Music of Non-Western Cultures
*2012 = 3312 Music and Psychology
*2013 = 3313 The Evolution of Jazz
2014 = 4300 Contemporary Scene

Ensembles

Participation in both large and small ensembles is required of all students whose major field of study is music in each of the years of the degree programmes. Details of specific participation requirements are available in the Department of Music.

Membership in the various ensembles is open to the University and the community by audition.

Following is a list of the ensembles sponsored by the Department of Music:

0051 Chorale
0052 Chamber Choir
0053 Symphonic Wind Ensemble
0054 Chamber Orchestra
0055 Jazz Band
0056 Brass Ensemble
0057 Musica Antiqua
0058 Percussion Ensemble
0059 Opera Workshop
0060 Guitar Ensemble
0061 Small Ensemble
0062 Accompanying

Oceanography

Oceanography is an inter-disciplinary science that includes studies of tides and currents, the chemistry of sea water, plants and animals that live in the sea, and ocean bottom sediments and underlying crustal structures. 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 fisheries biology.

In addition, several undergraduate classes are offered.

1850R Introduction to Oceanography, Lect. 3 hrs.; R.O. Fournier. *Prerequisite:* Restricted to second year, or more advanced students.

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 of feeling for the ocean, what oceanography is, and what oceanographers do. It is not a good "background to science" class, since little feeling will be obtained for scientific techniques which would otherwise be acquired in a laboratory class. Most of the material covered is descriptive rather than basic, inasmuch as it is impossible in the time allowed and the material covered to also teach the basic required sciences.

4160B Fisheries Oceanography, Lect. 3 hrs.; J.A. Koslow. *Prerequisite:* Biology 2060A or 2046R. Familiarity with calculus and statistical concepts helpful but not required. Permission of instructor is required.

The ecology of fisheries with emphasis on the factors affecting their production and stability. Topics covered include the seasonal and life cycles of commercially important fishes; their characteristics of feeding, growth, and reproduction; predator-prey and competitive interactions within fisheries communities; factors affecting recruitment success; and the impacts of commercial exploitation and climate change upon fish populations.

4170B Introductory Physical and Chemical Oceanography.

A class restricted to third- and fourth-year students registered in the Maritime Biology Honours Programme.

The following classes are offered to graduate students in the Oceanography Department, but also form part of the B.Sc. degree in Physics for those students intending to meet the educational prerequisite for a career in Meteorology, as established by the Atmospheric Environment Service. For further information, interested students should consult the Physics Department.

4120A Introductory Physical Oceanography, Lect. 3 hrs.; Staff. *Prerequisite:* Permission of the instructor.

This class explores some of the physical forces driving the oceans, and describes the responses of ocean water to these forces. Scales of ocean motion discussed range from currents of oceanic dimensions, like the Gulf Stream, through tides and waves, right down to very small-scale random movements of water known as turbulence. The class also includes a brief introduction to practical aspects of physical oceanography.

4210B Time Series Analysis in Oceanography, Lect. 3 hrs.; D.A. Huntley and C. Beaumont. *Prerequisite:* Permission of the instructor.

Much of the data collected in oceanography and other earth sciences are in the form of a time series; a measurement of a variable as it changes with time or place. Usually the simplest way of interpreting a time series is to divide it up into variations occurring in different ranges of frequencies. This class outlines some of the techniques for analysing time series with particular emphasis on spectral analysis and filtering.

4410R Dynamic Meteorology, Lect. 3 hrs. *Prerequisites:* Physics 4310R and permission of the instructor.

The basic laws of fluid dynamics are applied to studies of atmospheric motion, including the planetary boundary layer, synoptic scale disturbances (the familiar highs and lows on weather maps), front and global circulation. Emphasis is on the blend of mathematical theory and physical reasoning which leads to the best understanding of the dominant physical mechanisms. The class includes an introduction to numerical techniques and their use in weather forecasting models and studies of climate.

Philosophy

Chairperson of Department

S. Sherwin

Professors

D. Braybrooke, B.A. (Harv.), M.A., Ph.D. (Corn.), F.R.S.C. *Also in Political Science*
R.M. Campbell, B.A. (Harv.), Ph.D. (Corn.)
W.F. Hare, B.A. (Lond.), M.A. (Leic.), Ph.D. (Tor.), *(Major appointment in Education Dept.)*
F.H. Page, M.A. (Tor.), D.D. (Pine Hill)
R.P. Puccetti, B.A. (Ill.), M.A. (Tor.), Docteur de l'Université de Paris (Sorbonne)
P.K. Schotch, Ph.D. (Wat.)

Associate Professors

N.C. Brett, B.A. (New Hampshire), M.A., Ph.D. (Waterloo)
S.A.M. Burns, B.A. (Acad.), M.A. (Alta.), Ph.D. (Lond.)
R.M. Martin, B.A. (Col.), M.A., Ph.D. (Mich.)
S. Sherwin, B.A. (York), Ph.D. (Stan.)
T. Tomkow, B.A. (S.F.U.), Ph.D. (Cantab.)
T. Vinci, B.A. (Tor.), M.A., Ph.D. (Pitts.)

Assistant Professor

W.L. Barthelemy, B.A. (Wright St.), M.A. (Manitoba), Ph.D. (Waterloo)

Beginning in Philosophy

Everything people do or think about has a philosophical aspect, so there are many different ways of beginning in philosophy. Students new to philosophy can begin with any Exploratory Class.

First-Year Students are encouraged to take classes at the 100-level. These exploratory classes are:

100, 101, 102 Introduction to Philosophy (full-year)
103 Death and the Mind
104, 105 Introduction to Philosophy (half-year)
109 How to Win an Argument (half-year)
110 Legal Thinking (half-year)

Some of these classes will share some meetings with corresponding classes in the 200-level, but students who take them at the 100-level may receive different assignments, may meet in tutorials for special attention and advice, and are graded by standards appropriate to a first-year class. Some of these classes fulfill the Faculty "Writing Requirement". (Check with the Department.)

All Students in *any* year may begin with any Exploratory Class in the 200-level. These classes have no prerequisite, and are appropriate for students who have taken no philosophy as well as for students who have already done other Exploratory Classes, provided that they have not taken and will not take the corresponding class at the 100-level. The 200-level Exploratory Classes are:

200, 201, 202 Introduction to Philosophy (full-year)
203 Death and the Mind
204, 205 Introduction to Philosophy (half-year)
207 Justice, Law, and Morality: Concepts Version
208 Ethics in the World of Business
211 Symbolic Logic
213, 214 Principles of Logic (half-year)
216 Philosophical Issues of Feminism (half-year)
217 (full-year) & 271 (half-year) Existentialism
218 Philosophy of Education (half-year)
219 Logic for Computing
220 Philosophy of Religion
225 Religion and Human Behaviour
226 Philosophy of Art (half-year)
227 Justice, Law, and Morality: Regimes Version
241 Philosophy of Psychology (half-year)
242 Philosophy of Biology (half-year)
254 Philosophy of History (half-year)
255 The Marxist Approach to Historical Change (half-year)
266 Chance and Choice (half-year)
270 Philosophy in Literature
275 Right or Wrong
280 Ethics and Medicine

Going on in Philosophy

Any of the classes in the Exploratory group provides the student with a good introduction to philosophy. Students who wish to take more philosophy may take additional Exploratory Classes, or they may choose to take Core and Specialized Classes. Further Exploratory Classes broaden the student's acquaintance with topics and issues in philosophy. Classes in Core and Specialized groups deepen knowledge of particular topics, and develop skill in philosophical thinking.

Core Classes deal with issues that are fundamental to understanding philosophy. They allow students to pursue, in depth, issues raised in Exploratory Classes. The Core Classes are:

300 History of Western Philosophy
305 Theory of Knowledge
306 (half-year) & 309 (full-year) Intermediate Logic
310 Ethics
315 Self-Deception (half-year)
321 Philosophy of Law
330 Philosophy of Language (half-year)
335 & 337 Ancient Philosophy (half-year classes)
344 Personal Identity (half-year)
351 Philosophy of the Social Sciences (half-year)
361 The Rationalists (half-year)
362 The Empiricists (half-year)
363 Kant (half-year)
365 (full-year) & 367 (half-year) Philosophy of Science
385 Metaphysics

Most core classes have the prerequisite of any Exploratory Class (see individual class descriptions below for particulars). The King's Foundation Year Programme satisfies this prerequisite.

Specialized Classes are for advanced students; the usual prerequisite is at least one Core Class (but consult individual class descriptions below). The Specialized Classes are:

336 Ancient Philosophy from Beginnings to VI Century A.D.
338 History of Mediaeval Philosophy
408 Seminar in Exact Philosophy (half-year)
411 Theories of Ethics and Mind
412 Theory of Rational Decision (half year).
419 Topics in the History of Philosophy (half-year)
443 Seminar on Game Theory (half-year)
445 (full-year) & 453 (half-year) Theory of Action
446 Mind and Brain
447, 448 & 449 Philosophy, Politics, & Economics Seminars (half-year classes)
451 Topics in the Philosophy of Language
460 Contemporary Theories of Religion
498 (half-year) & 499 (full-year) Directed Reading

Degree Programmes

B.A. with Major in Philosophy Students must take at least five* classes in philosophy including (a) At least one* of the following: 300, 305, 310; plus (b) At least one* additional core class or at least one* of the following: 211, 213, 214, 219, 266, 408. All students planning to take a general degree in philosophy should talk to an undergraduate adviser in the department.

B.A. with Honours in Philosophy Students wishing to specialize in philosophy should take an honours course. It is the normal preparation for graduate study in philosophy. Its requirements are at least ten* classes in philosophy, including: (a) at least one* of: 300, 305, 310; plus (b) at least one* of: 211, 213, 214, 219, 266, 306, 309, 408; plus (c) at least two* core classes; plus (d) at least two* core or specialized classes.

. **Note* Classes in the department are either full- or half-year (i.e., full- or half-credit). When a number of classes is indicated in these requirements, that means the number of full-year classes, or the equivalent if some are half-year. Thus the requirement for two Core Classes may be filled by two full-year, or one full-year plus two half-year, or four half-year Core Classes.

Class Descriptions

Note: Many classes are listed as being **Exclusionary** to one another. This means that students **may not** take both classes so designated.

100, 101, 102 Introduction to Philosophy, Staff.

An introduction to a variety of problems that have concerned people with philosophical interests. Classes and sections differ in subject matter and requirements, so consult the Department to find out which ones especially suit you. Note: Students may not take more than one of these classes. Students who are taking (or who have taken) 104, 105, 200, 201, 202, 204 or 205 may not take 100, 101, or 102.

103 Death and the Mind, R.P. Puccetti. (Exclusionary to 203).

An enquiry into the nature of death, the possibility of survival, immortality and reincarnation, and the relevance of belief in an afterlife to the way we live our lives.

104, 105 Introduction to Philosophy, (half-year), Staff.

An introduction to a variety of problems that have concerned people with philosophical interests. Note: Students may take either one of these half-year classes alone, or may take both. Students who are taking (or who have taken) 100, 101, 102, 200, 201, 204 or 205 may not take 104 or 105.

109 How to Win an Argument, (half-year). T. Tomkow. (Exclusionary to 215).

This class is devoted to developing the practical skills involved in evaluating reasoning and producing convincing arguments.

110 Legal Thinking, (half-year). N. Brett.

Examination of controversial legal cases leads to understanding the nature of law and the techniques of practical moral reasoning.

200, 201, 202 Introduction to Philosophy, Staff.

See description for 100, 101, 102 above. Note: Students may not take more than one of these classes. Students who are taking (or who have taken) 100, 101, 102, 104, 105, 204 or 205 may not take 200, 201 or 202.

203 Death and the Mind, R.P. Puccetti. (Exclusionary to 103).

See description for 103, above.

204, 205 Introduction to Philosophy, (half-year), Staff.

See description for 104, 105 above. Note: Students may take either one of these half-year classes alone, or may take both. Students who are taking (or who have taken) 100, 101, 102, 104, 105, 200, 201, or 202 may not take 204 or 205.

207 Justice, Law, and Morality, D. Braybrooke.

An introduction to political philosophy and ethics. St. Thomas, Hobes, Hume, Locke, Bentham, Mill, Marx, Rawls, and other authors are considered to help answer questions such as: What is justice? What is its role in society? This class and 227 are cross-listed with Political Science. Together they provide a comprehensive survey of the history of political philosophy.

208 Ethics in the World of Business, D. Braybrooke.

Business practices are sometimes in accord with moral principles, sometimes at odds with them. Where in business is it easiest to be scrupulous? Where is it hardest? Could things be changed for the better, and, if so, what would be involved?

211 Symbolic Logic, R.M. Martin. (Exclusionary to 213 and 219).

An introduction to an artificial language constructed so as to make the operations of reasoning more precise.

213 and 214 Principles of Logic, (half-year classes) R.M. Campbell and P.K. Schotch (Exclusionary to 211 and 219).

Students cover the same material as in 211, while also devoting considerable attention to the relation between artificial languages and ordinary English, and to philosophical problems arising from the study of reasoning.

216 Philosophical Issues of Feminism, (half-year). S. Sherwin.

An examination of arguments for and against feminism, and of practical and theoretical issues associated with feminism, such as abortion and preferential hiring. Concepts to be studied include equality, justice, rights, freedom, and discrimination.

217 Existentialism, N. Brett. (Exclusionary to 271).

A general introduction to existentialist themes and authors, including Kierkegaard, Nietzsche, Sartre, and Camus.

218 Philosophy of Education, (half-year). W. Hare.

An introduction to the philosophical problems of education: What is education? What ought to be its goals? Who should decide what should be taught? (Cross-listed in Education Department.)

219 Logic for Computing, (half-year). P.K. Schotch. (Exclusionary to 211 and 213.)

This class introduces the concepts of elementary formal logic. Those aspects which apply to computing science, especially software design, are emphasized.

220 Philosophy of Religion, F.H. Page.

An introduction to the philosophy of religion, examining such questions as: Why is religion so difficult to define? Is it rational to believe in a divine being? Can religious experiences be validated?

225 Religion and Human Behaviour, F.H. Page.

A study of religion as a form of human experience and behaviour. Topics include: naturalistic theories of religion, the personal development of religion, religious conversion, meditation, and mysticism.

227 Justice, Law, and Morality: Regimes Version, R. Eden.

The problem of determining the best regime is considered through reading Tocqueville, Machiavelli, Hobbes, Montesquieu, Rousseau, Plato, and Aristotle. This class and 207 are cross-listed with Political Science. Together they provide a comprehensive survey of the history of political philosophy.

226 Philosphy of Art, (half-year). S.A.M. Burns.

Examines questions such as: What is art? Can judgements of artistic value be rational and objective? Can fear of fictional objects be real fear? Can music be a language?

241 Philosophy of Psychology, (half-year). T. Tomkow.

What are the philosophical presuppositions of the scientific study of the mind?

242 Philosophy of Biology, (half-year). R. Campbell.

What are the philosophical presuppositions of biology?

254 Philosophy of History, (half-year). D. Braybrooke.

Can the study of history be scientific? Are there any historical laws? Is history working toward some discernible goal?

255 Marxist Theory, (half-year). S.A.M. Burns.

Marxist Theory, both as philosophy and social science, is studied through an examination of major writings of Karl Marx. (Same as Pol. Sci. 2455B).

266 Chance and Choice, (half-year). Staff. (Exclusionary to 365).

An introduction to the principles by which we can make scientific predictions and choose, logically, between different courses of action. The class examines the workings of chance, or probability, and the theory of games.

270 Philosophy in Literature, R.M. Martin.

A study of some philosophical themes in modern literature. All readings will be literary works.

271 Existentialism, (half-year) (Exclusionary to 217).

See description under 217.

275 Right or Wrong, staff.

How can one solve moral problems that arise from situations like suicide, abortion, sexual exploitation, violence, discrimination, and unfair business tactics?

280 Ethics and Medicine, S. Sherwin.

Modern medicine 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 these problems, to be considered in this class, are: abortion, euthanasia, informed consent, confidentiality, paternalism, coercion, and the allocation of scarce resources.

Core Classes

Note that students who have taken the King's Foundation Year Programme have thereby satisfied the prerequisite for classes which list "Any Exploratory Class" as prerequisite.

300 History of Western Philosophy, T. Vinci. *Prerequisite:* Any Exploratory Class or permission of instructor.

The history of thought on several selected philosophical topics, traced by reading works of philosophers from the pre-Socratics through the XIX Century.

305 Theory of Knowledge, T. Vinci. *Prerequisite:* Any Exploratory Class.

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 about our knowledge of ourselves and other people. Attention is given to ancient and modern authors.

306 (half-year) **& 309 Intermediate Logic,** P.K. Schotch. *Prerequisite:* 211 or 213 or permission of instructor.

Devoted primarily to the study of formal semantics and its relation to symbolic language.

310 Ethics, R.M. Campbell. *Prerequisite:* Any Exploratory Class.
The main questions in this class are: Can an ethical theory have a rational basis? Can it ever provide a rational solution to practical ethical dilemmas? Readings from Hume, Mill, Kant, and contemporary authors.

315 Self-Deception, (half-year). S.A.M. Burns. *Prerequisite:* Any Exploratory Class.

A study of the moral and conceptual issues surrounding the idea of self-deception. How is it possible? Is it a moral failing? Why is self-knowledge difficult?

321 Philosophy of Law, N. Brett. *Prerequisite:* Any Exploratory Class.

A study of normative and conceptual issues arising from reflection on our legal system. Abstract legal principles and concepts are dealt with in the context of specific statutes and judicial decisions, e.g., the Narcotics Control Act, the Morgentaler case.

330 Philosophy of Language, (half-year). R.M. Martin. *Prerequisite:* Any Exploratory Class.

What does it mean to say that the elements of language have meaning?

335 & 337 Ancient Philosophy, (half-year classes). S.A.M. Burns. *Prerequisite:* Any Exploratory Class.

The beginnings of Western philosophy are studied in the writings of Plato, Aristotle, and their predecessors.

344 Personal Identity, (half-year). R.P. Puccetti. *Prerequisite:* Any Exploratory Class.

A consideration of what it is to be one and the same person through time, of the roles of memory and bodily continuity in this, and of the concept of a person.

351 Philosophy of the Social Sciences, (half-year). D. Braybrooke. *Prerequisite:* Any Exploratory Class.

An examination of philosophical questions about the presupposition, aims, and methods of the social sciences, for example, whether the quantitative methods of the natural sciences are appropriate in the social sciences. Cross-listed with political science.

361 The Rationalists, (half-year). S.A.M. Burns. *Prerequisite:* Any Exploratory Class.

Descartes, Spinoza, and Leibniz.

362 The Empiricists, (half-year). S.A.M. Burns. *Prerequisite:* Any Exploratory Class.

Locke, Berkeley, and Hume.

363 Kant, (half-year). T. Tomkow. *Prerequisite:* 361 or 362, or permission of the instructor.

Special attention will be paid to Kant's metaphysics.

365 (full-year) **& 367** (half-year) **Philosophy of Science,** T. Vinci. *Prerequisite:* Any Exploratory Class.

Induction, probability, and explanation are studied with special attention to the nature of scientific theories. No scientific background is presupposed. Note: Students may not take both of these classes. Students may not take both 365 and 266, 465, or 467.

385 Metaphysics, Staff. *Prerequisite:* Any Exploratory Class.

A study of topics such as the nature of substance and change, body and mind, cause and effect, and the concept of existence.

Specialized Classes

336 Ancient Philosophy from its Beginnings to the VI Century A.D., A.H. Armstrong.

Special attention is given to Plato and Aristotle, and to the Greek Philosophy of the first centuries A.D. and its influence on developing Christian thought (Same as Classics 3360).

338 History of Mediaeval Philosophy, R. Crouse.

Anselm, Aquinas, Ockham, some XIII Century Augustinians and Averroists and late Mediaeval mystics are studied most closely; attention is given to related political, literary, and theological concerns. (Same as Classics 3380).

408 Seminar in Exact Philosophy, (half-year). P.K. Schotch.

Application of the techniques of formal logic to philosophical issues. Principal subjects: ethics (deontic logic), philosophy of science (logic of empirical theories), logic of possibility and necessity.

411 Theories of Ethics and Mind, R. Campbell and R. Martin. *Prerequisite:* Consult instructor.

This class examines the relation between ethics and various theories of psychology, of the mind/body connection, and of human identity.

412 Theory of Rational Decision, (half year). Staff.

A study of foundational problems in comtemporary theory of rational decision, drawing on work by philosophers, psychoogists, economists and mathematicians.

419 Topics in the History of Philosophy, (half-year). Staff. *Prerequisite:* Any Core Class.

Subject will change from year to year. Consult Department.

443 The Theory of Games as an Approach to the Foundations of Ethics and Politics, (half-year). D. Braybrooke.

(Seminar in Philosophy, Politics and Economics). Cross-listed with political science. For class description see Political Science 4485B/5485B.

445 Theory of Action, R. Martin. *Prerequisite:* Any Core Class or permission of instructor. (Exclusionary to 453).

An investigation of the nature of action, seeking criteria for individuating, describing, and explaining actions. Subjects may include: causation and action and the roles of volitions, intentions, motives, and reasons; responsibility for actions, and the concept of free actions.

446 Mind and Brain, R.P. Puccetti.

An interdisciplinary approach, combining philosophical analysis and neuroscientific data, to 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.

447 Utilitarianism, Classical Liberalism, and Democracy, (half-year). D. Braybrooke. *Prerequisite:* Normally, classes in philosophy or political science or economics: consult instructor.

(Seminar in Philosophy, Politics, and Economics) 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. Cross-listed with economics and political science.

448 Social Choice Theory, (half-year). D. Braybrooke. *Prerequisite:* See 447.

(Seminar in Philosophy, Politics, and Economics) 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 with economics and political science.

449 The Logic of Questions, Policy Analysis, and Issue Processing, (half-year), D. Braybrooke. *Prerequisite:* See 447.

(Seminar in Philosophy, Politics, and Economics) With the help of the logic of norms and the logic of questions, this class considers how political systems process issues and transform them (for better or worse) during processing. Cross-listed with economics and political science.

451 Topics in the Philosophy of Language, T. Tomkow. *Prerequisite:* 330 or permission of instructor.

The examination of recent work in the philosophy of language and semantics including writings by Frege, Russell, Quine, Davidson, Stalnaker, Lewis, and Kripke.

453 Theory of Action, (half-year) (Exclusionary to 445).

See description under 445.

460 Contemporary Theories of Religion, F.H. Page. *Prerequisite:* 220 or permission of instructor.

Present-day discussions of religion by well-known philosophers are studied.

498 (half-year) **& 499** (full-year) **Directed Reading,** Staff. *Prerequisite:* Permission of instructor. Consult department for details.

Individual classes to suit special interests can be developed jointly by a student and an instructor.

Changes and Additions

As the Calendar goes to press before plans for the next academic year are completed, there may be significant changes in the classes listed above. Students should consult the Department for names of instructors and revisions.

Graduate Studies

The Department offers graduate classes leading to the M.A. Details can be found in the Calendar of the Faculty of Graduate Studies, and by consulting the Department's Coordinator of Graduate Admissions.

Physics

Chairperson of Department
M.G. Calkin

Professor Emeritus
W.J. Archibald, M.A. (Dal.), Ph.D. (Virg.), D.Sc. (U.N.B.), D.Sc. (Dal.), F.R.S.C.

Professors
D.D. Betts, M.Sc. (Dal.), Ph.D. (McGill), F.R.S.C. - *Dean of Faculty of Arts and Science*
M.G. Calkin, M.Sc. (Dal.), Ph.D. (U.B.C.)
D.J.W. Geldart, B.Sc. (Acadia), Ph.D. (McM.)
C.K. Hoyt, M.Sc. (Dal.), Ph.D. (M.I.T.)
M.H. Jericho, M.Sc. (Dal.), Ph.D. (Cantab.), *(George Munro Professor of Physics)*
D.B.I. Kiang, B.Sc. (Mt.A.), M.Sc., Ph.D. (McM.)
H.J. Kreuzer, M.Sc., D.Sc. (Bonn) *(Killam Research Professor)*
G.F.O. Langstroth, B.Sc. (Alta.), M.Sc. (Dal.), Ph.D. (Lond.)
R.H. March, B.Sc., M.Sc. (Dal.), D.Phil. (Oxon.)

Associate Professors
B.L. Blackford, B.Sc. (Acad.), M.Sc. (M.I.T.), Ph.D. (Dal.)
J.G. Cordes, M.Sc. (Dal.), Ph.D. (Cantab.)
D.F. Goble, B.Sc., M.Sc. (Alta.), Ph.D. (Tor.)
S.T. Nugent, B.Sc. (Mem.), B.E. (N.S.T.C.), M.A.Sc. (Tor.), Ph.D. (U.N.B.), P.Eng.
B.E. Paton, B.Sc., M.Sc. (Waterloo), Ph.D. (McG.)
P.H. Reynolds, B.Sc. (Tor.), Ph.D. (U.B.C.)
A.M. Simpson, B.A. (Cantab.), M.Sc., Ph.D. (Dal.)
G. Stroink, Ph.D. (McG.)
C.G. White, M.Sc. (Dal.)

Assistant Professors
R.A. Dunlap, B.Sc. (Worcester), A.M. (Dart.), Ph.D. (Clark)
D.A. Tindall, B.A., Ph.D. (Cantab.)

Assistant Professor (Research)
G.A. Gumbs, B.A. (Cantab.), M.Sc., Ph.D. (Tor.)

Research Associates
K. De'Bell, Ph.D. (London)
J.T. Folinsbee, Ph.D. (Ill.)
E. Sommer, Ph.D. (Maria-Curie Sklodawska)

Senior Instructor
F.M. Fyfe, M.Sc. (Dal.)

Instructor
W. Zukauskas, B.Sc. (Dal.)

Post Doctoral Fellow
A.J. Purcell, Ph.D. (U.B.C.)

MacGregor Postdoctoral Fellow
K. Dini, Ph.D. (Sheffield)

Adjunct Professors
H.W. Jones, B.Sc., Ph.D. (Lond.), F.Inst.P., P.Eng.
H.W. King, B.Sc., Ph.D. (Birm.), D.I.C. (Lond.), F.R.S.A., F.Inst.P., F.I.M., C.Eng., P.Eng.
A.D.J. O'Neill, M.Sc. (McG.) Ph.D. (Sask.)
R. Ravindra, B.Sc. (Kharapur), M.A., Ph.D. (Tor.) (jointly with Religion)

MaGregor Teaching Fellows
H.-W. Kwan
M. Mieszkowski
K. Nath
O. Sezerman

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 is an orderly, efficient way.

First-Year Classes

There are three first-year classes. They all give a general introduction to physics, but each has its own particular approach and selection of topics. Only one first year physics class may be used for credit towards a degree.

Physics 1000 is a survey class offering a wide range of topics in both classical and modern physics.

Physics 1100 is intended for students intending to make a study of engineering or a physical science. Previous background in physics is desirable.

Physics 1300 is an introductory physics class which is oriented towards the health sciences.

Degree Programmes

Bachelor's Degree/Major in Physics
Students intending to major in physics should include Physics 1100 and Mathematics 100A and 101B in their first-year programme. (Physics 1000 and 1300 are not normally included in a 'Major'.) Physics 2450, 3400, 4020B may not be included in a 'Major' to satisfy requirement 5.2.1.1(c). At least two 3000-level classes must be included, but in any one year, no student in a degree programme may take only Physics 3000A/3010B and Physics 3340A/3350B.

B.Sc. Major in Physics (example only, other possibilities exist):

Year I, 1100 (Math 100A & 101B), science, arts, elective.
Year II, 2200A, 2210B, 2300A, 2330B (Math 200 or 220), science, elective.
Year III, Two 3000-level Physics classes; one additional Physics class is recommended; electives.

B.Sc. Major in Physics, with Diploma in Engineering.
The physics content of this programme might be as follows:
Year I, Physics 1100
Year II, Physics 2200A, 2210B, 2300A, 2330B
Year III, Physics 3160A, 3170B, 3340A, 3350B
Other possibilities exist.

For the remainder of the programme, consult the Engineering Department.

Geophysics
For those interested in Geophysics, refer to classes 205B, 313A, 427A, 428B, and 429B, listed under Geology.

B.Sc. with Honours in Physics
All students who intend to take a B.Sc. with Honours in Physics are encouraged to discuss their programme with staff members of the department and to consult with the Chairman of the Department at the beginning of the second year.

The following classes will normally be taken.
Year I
1. Chemistry 110.
2. Mathematics 100A & 101B.
3. Physics 1100.
4. Arts or Science elective.
5. Arts elective.

Year II
6. Science elective.
7-8 Two mathematics classes.
9-10. Physics 2110 and 2120.

Year III
11. Arts or Science elective.
12. Mathematics 311A, 312B.
13-15. Three Physics classes, including 3000A, 3010B, 3140A, 3150B, 3200A, 3210B.

Year IV
16. Arts, science or mathematics elective.
17-20. Four physics classes at the 4000 level including 4000B, 4090A, 4100B, 4160A, 4150R, 4230B. A thesis and a comprehensive examination are also required.

Students with special interests pick electives carefully. The following suggestions may serve as a guide.

Applied Physics Option: Physics 3340B, 3350A, 3440B, 4200A, 4210A, 4220B, 4300A, 4330A, 4350B.

Theoretical Physics Option: Physics 4170B, 4180A/B, 4480A, 4650A/4660B; Mathematics 364B, 305, 332A, 414A.

Programme in Engineering-Physics
The physics department participates in, and is responsible for teaching the physics components of, the programme leading to the degree of Bachelor of Engineering in Engineering Physics, awarded jointly by the Technical University of Nova Scotia and Dalhousie. For details consult the TUNS Calendar.

Combined Honours
Students interested in both Physics and another science may wish to take a B.Sc. with Honours in Physics and the other subject combined.

Students contemplating such a programme should in any case consult the Departments before the beginning of their second year of study.

Co-operative Education Programme in Physics
The co-operative programme provides physics students with an integrated pattern of academic study and supervised work terms in industry, government laboratories and institutes, etc. The programme enables students to obtain a better appreciation of the practical problems they will face in their physics careers upon leaving the University. The work term experience gives students an opportunity to orient themselves at an early stage towards the practical application of their newly acquired knowledge, and adds to their motivation for academic study.

Eligibility
Students entering their second year of an honours programme in physics or combined honours programme at Dalhousie are eligible for admission.

The Work-Study Programme
The programme consists of 8 academic terms and 4 supervised work terms. The academic programme and required classes are the same as for the B.Sc. degree with Honours in Physics. In addition, in year 2, Co-op students are required to participate in the non-credit class and lecture series "Scientific Methods".

Further Information
For further information contact the Programme Co-ordinator, Co-operative Employment Programme in Physics, Department of Physics, Dalhousie University, Halifax, N.S. B3H 3J5.

Diploma in Meteorology
The one-year diploma in meteorology programme consists of the following five classes: Physics 4500A/4510B, Physics 4520A/4530B, Physics 4540A/4550B, Oceanography 4410R, Oceanography 4120A, Math 408B (or Oceanography 4210B). Students admitted to this programme are eligible for consideration for AES-NSERC Studentships in Meteorology which, for 1982-83, are valued at $4,000 per annum.

For admission into this programme, which has a limited enrollment, a general B.Sc. 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 Computer Science. For students enrolled in a B.Sc. programme at Dalhousie, the following classes are recommended: Physics 1100, 2200A/2210B, 2300A/2330B, 3160A/3170B, 4310; Math 100A/101B, 200, 203A/204B, 207A/221B, 311A/312B; and Computer Science 140A/141B.

1000 Survey of Physics, Lect. 3 hrs., Lab./tutorial 1 hr.; P.H. Reynolds.

A survey of physics, not normally accepted as a prerequisite to advanced classes in physics. It is designed for students in arts and science (and possibly also pre-medicine and pre-dentistry) 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. Mathematics is used as a language for expressing the basic ideas of physics, but normally this is no more advanced than high school algebra and trigonometry. Problem sets are assigned on a regular basis. Help with these can be obtained at the afternoon tutorial hour or through the Physics Resource Centre. Two or three times each term the tutorial time will be used to carry out some simple laboratory experiments.

Text: J.B Marion, *Physics in the Modern World,* 3rd ed., Academic Press.

1100 Introduction to Physics, Lect. 3 hrs. (3 sections); Lab. 3 hrs. every 2nd week; M.G. Calkin, D.F. Goble, R.H. March.

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 100/101) concurrently. This class concentrates on three main areas: mechanics, oscillations and waves, and electricity and magnetism. As far as possible, the basic ideas are introduced through inclass demonstrations, enabling students to relate the verbal and mathematical descriptions to events in the real world. In addition, students are able to explore the physical world via labs every second week.

Text: Sections 1 and 2: Sears, Zemensky, Young, *University Physics,* 6th Ed., Addison-Wesley; Section 3: Halliday and Resnick, *Fundamentals of Physics, 2nd ed.*

1300 Physics In and Around You, Lect. 3 hrs.; Lab./tutorial 3 hrs.; C.K. Hoyt.

An introduction to physics for students in biology, pre-medicine, pre-dentistry and allied health sciences, not normally accepted as a prerequisite to advanced classes in physics. After introducing basic concepts in physics, every opportunity is used to apply these concepts by using realistic biological examples, e.g., forces and torques are directly related to muscle action, fluids to blood circulation, sound to hearing. Every third week there is a laboratory experiment; the experiments stress the importance of basic concepts in physics to phenomena in biology and medicine. Students beginning this class should be familiar with trigonometry and algebraic equations.

Text: Kane and Sternheim, Physics 2nd ed., Wiley.

2110/2120.

These two classes are intended to be complementary, and for second-year honours students. Unless the circumstances are unusual, they should be taken together. The classes have a common laboratory, i.e. work done in the laboratory periods is included in the grade for both classes. Prerequisites are also common: Physics 1100 and Mathematics 100A & 101B. (Statistics have shown that a student with less than a "B" grade in Physics 1100 can be expected to have difficulty with 2110 and 2120.)

2110 Mechanics, Lect. 3 hrs.; Lab. 3 hrs.; C.G. White.

The first part deals with basic vector mathematics. Newton's laws of motion, motion in unaccelerated reference frames, the two principles of special relativity and their use in describing space and time intervals in unaccelerated reference frames, conservation of energy and momentum from both the classical and relativistic view point, and harmonic oscillations. The second part deals with wave motion in mechanics, electromagnetism, quantum theory. Fourier analysis of wave packets and pulses is included.

Text: Berkeley Physics Course, Vol. 1 *Mechanics*, McGraw-Hill, 1965; Berkeley Physics Course, Vol. 3 *Waves and Oscillations,* McGraw-Hill, 1965.

2120 Electricity, Lect. 3 hrs.; Lab. 3 hrs.; B.L. Blackford.

The class begins by studying electrostatics, including the concepts of electric field and electric potential as physical quantities. Next, the motion of charge in conducting materials is discussed, leading to the solution of circuit problems involving capacitance and inductance. By considering the electric field of a moving charge in the light of the theory of relativity, the nature of the magnetic field is introduced and its properties discussed. Electric and magnetic fields in matter are also discussed. The laboratory work is designed to illustrate the physical principles discussed in the lectures and simultaneously to introduce students to the use of electronic apparatus and to the design of some simple circuits.

Text: Berkeley Physics Course, Vol. 2 *Electricity and Magnetism*, McGraw-Hill, 1965.

2200A/2210B

Applied Physics is designed to acquaint you with the wide range of physical principles at play in the world around us. These principles are discussed in class but the major emphasis is on the practical aspects of physics. In the lab, you learn to apply principles of physics and modern measuring techniques in the solution of practical problems found in the world of science and technology.

2200A Waves and Vibrations, Lect. 3 hrs.; Lab. 3 hrs.; G. Stroink. *Prerequisite:* a first-year class in physics.

Subject material: theory of measurements, mechanical vibrations, synthesis of waves, acoustics, resonance, interference.

Text: French, A.P., *Vibration and Waves,* Norton.

2210B Electromagnetic Waves, Lect. 3 hrs.; Lab. 3 hrs.; G. Stroink. *Prerequisite:* 2200A.

Subject material: Electromagnetic spectrum, geometric optics, interference, diffraction, matter waves, theory of solids, semiconductors.

Text: D. Halliday and R. Resnick *Physics*, Part 2, Wiley, 1978.

2220A* Radiation Physics, Lect. 3 hrs.; G.F.O. Langstroth. Offered in alternate years beginning in 1982-83. Enrollment is limited. *Prerequisite:* First-year physics or approval of instructor.

Contents include: nature and origins of radiation, and the interaction of radiation with matter.

2230B* Radiation Physics, Applications, Lect. 3 hrs.; G.F.O. Langstroth. Offered in alternate years beginning in 1982-83. Enrollment is limited. *Prerequisite:* Preference given to students who have taken 2220A.

The class follows on the background obtained in Physics 2220A. It discusses the detection of radiation and its application in the health sciences and elsewhere. It then continues to treat the physical principles of devices in common use, which may include optical instruments and electronic instrumentation. Topics vary according to the interest of the students.

2300A/2330B

For second year science and engineering students who wish to take a second class in physics, in addition to Physics 2200, 2210 or who for some reason are unable to take that class. Students may take third-year physics if they have taken this class and Physics 2200, 2210.

2300A Mechanics, Lect. 3 hrs.; C.G. White. *Prerequisites:* Physics 1100, Mathematics 100A and 101B.

The basic laws of classical mechanics. It covers similar material to that of Physics 1100 but with a more advanced mathematical treatment which allows for more detailed application of the basic laws to specific physical examples, e.g., examples involving rotation and planetary orbits.

Text: Kleppner and Kolenkow, *An Introduction to Mechanics,* McGraw-Hill, 1973.

2330B Electricity and Magnetism, Lect. 3 hrs.; C.G. White. *Prerequisite:* Physics 2300A.

The basic laws of classical electricity and magnetism and the application of these laws to the analysis of electric and magnetic fields in solids. The discussion of fields in solids leads to some reference to quantum effects. A brief treatment of some common electrical circuits is also included.

Text: Tipler, *Physics,* Vol. 2, Worth.

2450 Astronomy, Lect. 3 hrs.; D.A. Tindall. *Prerequisite:* One first-year science class.

An introduction to Astronomy for the general science student, *not* the physics specialist. 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.

Text: Pasachoff and Kutner, *University Astronomy,* Saunders, 1978.

2500* Astronomy and Introductory Astrophysics, Lect. 3 hrs.; D.A. Tindall. Offered in alternate years, beginning in 1981-82. *Prerequisite:* Physics 1100 or permission of instructor.

This is a basic class designed primarily for students who may wish to pursue more advanced studies in astronomy or in astrophysics. It is appropriate for a physics major or an honours physics student. Mathematics and the laws of physics are applied to show how quantitative information follows from observational data, and how a consistent picture emerges of the structure and evolution of the universe.

Text: Pasachoff and Kutner, *University Astronomy,* Saunders.

3000A/3010B Experimental Physics, Lab. 6 hrs.; Lect. 3 hrs.; R.A. Dunlap. *Prerequisites:* For honours students, Physics 2110, 2120. For major students, Physics 2300A, 2330B, 2200A, 2210B. Exceptions have been made.

Designed to give students a chance to do non-set experiments and thereby encounter and solve

on their own the problems of experimentation. As the number of experiments is small (four to six), students should achieve a real understanding of a few physical phenomena. Topics cover a wide range of fields such as atomic physics, nuclear physics, solid state physics and electronics. A measurement of one of the fundamental constants such as c, G or e is required. Other than this the student is free to choose the field of experimental study.

3005A/3015B Experimental Physics, Lab. 6 hrs.

As for 3000A/3010B, but without the lectures. Available only to Engineering - Physics students from TUNS.

3140A Introduction to Quantum Physics, Lect. 3 hrs.; J.G. Cordes, *Prerequisite:* Mathematics 200 or its equivalent.

This introduction to quantum physics first analyses difficulties of classical physics (black body radiation, radiation from accelerated charges and atomic spectra). The experimental basis of the wave-particle duality of light is discussed and the existence of diffraction patterns for particles is used to motivate the construction of wave equations for particles. The determination and interpretation of solutions of Schrödinger's equation is illustrated by simple examples. The three dimensional Schrödinger equation is discussed, with special emphasis on the hydrogen atom. The concept of electron spin is also introduced.

Text: Eisberg and Resnick, *Quantum Physics*, etc.

3150B Modern Physics, Lect. 3 hrs.; B.E. Paton. *Prerequisite:* Physics 3140A.

Provides further application of the basic quantum mechanical principles presented in 3140A to topics in atomic, nuclear and solid state physics.

Text: Eisberg and Resnick, *Quantum Physics, etc.*

3160A Topics in Physics, Lect. 3 hrs.; G.F.O. Langstroth. *Prerequisite:* At least one second-year level physics class.

An introduction to thermodynamics, statistical mechanics, and other topics in classical physics.

3170B Topics in Physics, Lect. 3 hrs.; G.F.O. Langstroth. *Prerequisite:* At least one second-year level physics class.

This is complementary to 3160A. An introduction to optics and modern physics.

3200A Thermodynamics, Lect. 3 hrs.; D. Kiang. *Prerequisite:* Some knowledge of partial derivatives; Mathematics 200, or its equivalent, which may be taken concurrently with the class.

An introduction to the laws and basic concepts in classical thermodynamics. Topics include equations of state, heat engines, thermodynamic functions, and phase equilibriums.

Text: Zemansky and Dittman, *Heat and Thermodynamics,* 6th ed.

3210B Statistical Mechanics, Lect. 3 hrs.; D.D. Betts. *Prerequisites:* Physics 3200A, or its equivalent; Mathematics 200, or its equivalent.

In this class the tools are developed to link the physical laws of the microscope world, and the underlying atomic processes of the laws of thermodynamics are explored.

Text: Kittel and Kroemer, *Thermal Physics*, 2nd Ed., Freeman.

3340A Electronics, Lect. 3 hrs.; H.W. Jones. *Prerequisites:* Physics 2120 or 2300A/2330B; Mathematics 220 or 200 or 248A/249B.

Topics include: carrier transport in semiconductors, properties of diodes and transistors, amplifiers, oscillators, modulation, demodulation and rectification, operational amplifiers, linear and nonlinear analog systems.

Text: Seidman and Weintraub, *Electronics.*

3350B Networks, Lines and Filters, Lect. 3 hrs.; H.W. Jones. *Prerequisite:* Physics 2120 or 2300A/2330B, Mathematics 220 or 200 or 248A/249B.

Topics include: network reduction, the 4-terminal network and solution by matrix methods, properties of distributed constant transmission lines, active and passive filters.

Text: Papoulis, *Circuits and Systems.*

3400* The Rise of Science and the Modern World, Lect./Sem. 2 hrs.; R. Ravindra (Physics), J. Farley (Biology). (Same as Biology 3400, History 3070 and Relgion 3500. Class description to be found under Biology 3400.)

3440A/B Optics, Lect. 3 hrs.; C.K. Hoyt. *Prerequisite:* Physics 2300A/2330B, or Physics 2120, or Physics 2210B and Mathematics 220.

Topics are selected from areas such as the radiation from accelerated charges, the statistical properties of the fields from assemblies of radiators, interference, diffraction, and the application of Fourier transforms to the structure of images, the resolving power of instruments and the characterization of coherence. The students should be familiar with vector analysis, Maxwell's equations and the use of complex exponential functions. In any one year, only one of 3440A and 3440B will be given.

3810B Micro-Computers and the Real World, Lect. 3 hrs.; computer programming 1 hr; B.E. Paton. *Prerequisite:* Physics 2200A/2210B or 2110/2120.

Subject material: measurement theory, modern sensors; microcomputer architecture; simple chip computers; software simulation of digital electronic circuits; machine language programming; assembly language programming; interfacing techniques; development of "intelligent" instruments.

Text: Southern, *The 6800 Microprocessor.*

4000B Advanced Lab, Lab. 6 hrs.; B.L. Blackford. *Prerequisite:* Fourth-year standing in physics or engineering-physics or permission from the instructor.

This is a physics and engineering-physics laboratory class in which students in groups of two work largely on their own initiative. The student may select experiments from the fields of optics, acoustics, solid state devices and low temperature physics. Detailed laboratory reports on the experiments are required and students are expected to demonstrate a good grasp of underlying physical principles.

4020B* Special Topics in the History and Philosophy of Science, Seminar 3 hrs.; R. Ravindra.

4090A Advanced Classical Mechanics, Lect. 3 hrs.; G.A. Gumbs.

Topics include the principle of least action, Lagrange's equation, Hamilton's equation, Caronical transformations, Hamilton-Jacobi equation.

Text: Goldstein, *Classical Mechanics*, 2nd ed.

4100B Electrodynamics, Lect. 3 hrs.; S.T. Nugent.

Topics include: electromagnetic waves, radiation from moving charges, energy loss of charged particles passing through matter, plasma physics.

Text: Panofsky and Phillips, *Classical Electricity and Magnetism..*

4151A Quantum Mechanics, Lect. 3 hrs.; D. Kiang. *Prerequisite:* Physics 3140A.

4152B Quantum Mechanics, Lect. 3 hrs.; D. Kiang. *Prerequisite:* Physics 4151A.

Topics discussed include: concepts and formulation of quantum mechanics, harmonic oscillator, momentum, angular the central force problem and approximation methods.

Text: Liboff, *Introductory Quantum Mechanics.*

4160A Mathematical Methods of Physics, Lect. 3 hrs.; D.J.W. Geldart. *Prerequisite:* Mathematics 311A/312B or permission of the instructor.

Topics discussed include: complex variable theory, Fourier and Laplace transform techniques, special functions, partial differential equations.

Text: Lebedev, *Special Functions and Their Applications.*

4170B Topics in Mathematical Physics, Lect. 3 hrs. D.J.W. Geldart. *Prerequisite:* Physics 4160A.

This class is a continuation of Physics 4160A and deals with special topics in mathematical physics, such as the Green's function technique for solving ordinary and partial differential equations, scattering theory and phase shift analysis, diffraction theory, tensor analysis.

Text: Lebedev, *Special Functions and Their Applications.*

4180A/B* Nuclear Physics, Lect. 3 hrs.; D. Kiang. *Prerequisite:* Physics 3140A.

This is an introductory class. Topics discussed include: nucleon-nucleon interactions, nuclear structure, gamma transitions, alpha decay, beta decay and nuclear reactions. In any one year, only one of 4180A and 4180B are given.

Text: Segré: *Nuclei and Particles;* 2nd ed.

4220A Microcomputer Based Instrumentation, Lect. 2 hrs; Lab. 3 hrs.; B.E. Paton. *Prerequisite:* Physics 3810B.

Subject material: instrument design; analog to digital and digital to analog techniques; custom interfacing to sensors; algorithms; parallel and serial output data links; software testing and debugging; hardware testing and debugging; research project.

Text: Zaks: *Microcomputer Interfacing.*

4230A/B Introduction to Solid State Physics, Lect. 3 hrs.; D.A. Tindall. *Prerequisite:* Physics 3140 or permission of the instructor.

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.

Text: Kittel, *Introduction to Solid State Physics,* 5th Ed., Wiley.

4300A Applied Acoustics, Lect. 3 hrs.; H.W. Jones. *Prerequisite:* At least one class in Physics, beyond first-year level.

Three areas of acoustics are discussed as separate topics to serve the needs of students from different disciplines. The instruction is by guided reading, supplemented with a small number of general and introductory lectures, together with a limited series of specialised lectures related to each topic. The three topics are (i) physical acoustics for psychologists, (ii) ultrasonics and underwater acoustics, and (iii) physical acoustics allied to noise control, architectural and building acoustics and sound recording and reproduction.

Text: Kinsler and Frey, Fundamentals of Acoustics.

4310 Fluid Mechanics

This class is a cross-listing for Oceanography 5310 and is accepted as a physics class.

4330A Physical Properties of Materials, Lect. 3 hrs.; H.W. King. *Prerequisite:* Physics 3150B.

The principles of solid state physics are applied to the study of materials. Physical properties have intrinsic symmetry which interacts with the symmetry of the crystal structure of the material, thereby defining the number of coefficients necessary to describe the property. Although solid state properties such as electron transport, magnetism, semiconductivity, superconductivity and the optical properties of dielectrics and semiconductors owe their existence to the quantum properties of electrons, the magnitude of these properties is strongly influenced by microstructural effects such as solid solution alloying, crystal defects, grain boundaries, textures and plastic deformation.

Text: Nye, *Physical Properties of Crystals,* Oxford Univ. Press, 1969.

4350B Energy, Sources and Conversion, Lect. 3 hrs.; H.W. King. *Prerequisites:* Physics 3140A, 3150B, Engineering 340A.

Topics discussed include: extent and use of world energy supplies, thermodynamics of heat engines, thermojunction generators and refrigerators, solar generators, thermionic generators, fuel cells and related devices, chemical primary and secondary cells, magnetohydrodynamics, nuclear fission processes, and breeder reactors.

Text: Angrist, *Direct Energy Conversion.*

4460A/B* Optics, Lect. 3 hrs.; C.K. Hoyt. *Prerequisite:* Physics 3440A/B. Registration requires prior Departmental consent.

A continuation of Physics 3440A/B dealing with coherence, polarization, scattering by matter, the electromagnetic properties of matter, including crystals, reflection, refraction and double refraction. In any given year, only one of 4460A and 4460B will be offered.

4480A Applied Group Theory, Lect. 3 hrs. Offered in alternate years beginning in 1979-80.

This is cross-listed with Mathematics 332A, but for students in Physics 4480A, additional reading will be required.

4500A Atmospheric Physics I, Lect. 3 hrs.; D.F. Goble. *Prerequisite:* At least one third-year level physics class.

Main topics covered in this class are atmospheric thermodynamics and atmospheric radiation.

Reference: J.V. Iribarne and W.L. Gosdon, *Atmospheric Thermodynamics,* Reidel; G.J. Haltinev and F.L. Martin, *Dynamic and Physical Meteorology,* McGraw-Hill.

4510B Atmospheric Physics II, Lect. 3 hrs.; D.F. Goble. *Prerequisite:* Physics 4500A.

The major topic covered in this class is cloud physics. Other topics include atmospheric optics, atmospheric acoustics, lightning, and radar techniques.

Reference: R.R. Rogers, *A Short Course in Cloud Physics,* Pergamon; J. Battan, *Radar Observation of the Atmosphere,* U. of Chicago Press; *Atmospheric Physics,* Readings from Scientific American, Freeman.

4520A General Meteorology I, Lect. 3 hrs.; Staff. *Prerequisite:* At least one third-year level physics class.

This class provides students with an understanding of the origin and composition of the atmosphere, its thermal structure, the general circulation, airmass and frontal theory, weather-generating physical processes and their consequences.

Texts: S. Petterssen, *Introduction to Meteorology,* McGraw-Hill. S. Petterssen, *Weather Analysis and Forecasting, Vol. I,* McGraw-Hill.

4530B General Meteorology II, Lect. 3 hrs.; Staff. *Prerequisite:* Physics 4520A.
This class expands on knowledge acquired in 4520A. Topics studied include hydrostatic stability and instabilitymicro-scale phenomena, local wind systems, controls on weather and climate. Students ansfer, clouds, fog are exposed to applications of metorological knowledge and theory to problems in air pollution control, hydrology, agriculture and other fields.

Text: S. Petterssen, *Weather Analysis and Forecasting, Vol. II,* McGraw-Hill. Other selective reading will be assigned.

4540A Synoptic Meteorology I, Lect. 2 hrs.; tutorial and laboratory 3 hrs.; Staff. *Prerequisite:* At least one third-year level physics class.

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. The class includes a weekly three-hour tutorial-laboratory period during which graphical and computer methods are applied to the examination of real atmospheric systems.

4550B Synoptic Meteorology II, Lect. 2 hrs.; tutorial and laboratory 3 hrs.; Staff. *Prerequisite:* Physics 4540A.

This class extends the analysis and diagnosis of atmospheric dynamics and weather processes introduced in Physics 4540A. Modern statistical and computer methods and satellite techniques are discussed. The class includes a weekly three-hour tutorial-laboratory period during which case studies of atmospheric systems and processes are carried out.

4650A/4660B Relativity and Cosmology, Lect. and tutorials 3 hrs.; Staff. Offered in alternate years, beginning in 1980-81. *Prerequisites:* Physics 2110 and 2120, Mathematics 311A and 312B, or the consent of the instructor.

An introduction to both the theoretical and observational basis of modern physical cosmology. The first half is devoted to the development of the 4-vector formalism for the Special and the General theories of Relativity. Einstein's field equations are developed and some realistic cosmological models, based on these equations, are discussed. The emphasis is on intuitive and physical insight rather than mathematical rigour. The second half is devoted to understanding available observational data in cosmology in the light of previously developed theory. In addition to solving regularly assigned problems, each student makes a departmental presentation towards the end of the year concerning the latest developments in a topic of choice, such as 'black holes', 'age of the universe', or 'primordial radiation'.

8890 Co-op 2nd Year Seminar, (non-credit)

8891 Co-op Work Term I

8892 Co-op Work Term II

8893 Co-op Work Term III

8894 Co-op Work Term IV

Graduate Studies

The Department of Physics provides courses of study leading to the advanced degrees of M.Sc. and Ph.D. Areas of research undertaken at Dalhousie include: solid state, geophysics, low energy nuclear physics, low temperature, theoretical physics, and oceanography. Further details are given in the Calendar of the Faculty of Graduate Studies.

Political Science

Chairperson of Department
D.W. Stairs

Professors Emeritus
J.H. Aitchison, B.A., B.Ed. (Sask.), B.Sc. (Lond.), Ph.D. (Tor.)
J.M. Beck, M.A. (Acadia), M.A., Ph.D. (Tor.), F.R.S.C.

Professors
P.C. Aucoin, B.A. (S.M.U.), M.A. (Dal.), Ph.D. (Queen's)
R. Boardman, B.Sc., Ph.D. (Lond.) *(Director, Centre for Foreign Policy Studies)*
E.M. Borgese *(Professor of International Ocean Affairs)*
D. Braybrooke, B.A. (Harv.), M.A., Ph.D. (Corn.), F.R.S.C.
D.M. Cameron, B.A. (Queen's), M.A., Phil.M., Ph.D. (Tor.)
J.G. Eayrs, B.A. (Tor.), A.M., Ph.D. (Col.), F.R.S.C. *(Eric Dennis Memorial Professor of Government and Political Science)*
G. Grant, B.A. (Queen's), D.Phil. (Oxon.), LL.D. (Trent), D.Lit. (Mt.A.), LL.D. (Dal.), LL.D. (Tor.), F.R.S.C.
K.A. Heard, B.A., M.A., Ph.D. (Natal)
P. Pross, B.A., M.A. (Queen's), Ph.D. (Tor.)
T.M. Shaw, B.A. (Sussex), M.A. (Prin., East Africa), Ph.D. (Prin.)
D.W. Stairs, B.A. (Dal.), M.A. (Oxon.), Ph.D. (Tor.), F.R.S.C.
G.R. Winham, B.A. (Bowdoin), Dip. in Int. Laws (Manc.), Ph.D. (N.Car.)

Associate Professors
R.L. Dial, B.A. (U. of Calif. Santa Barbara), M.A., Ph.D. (U. Calif.-Berkeley).
R. Eden, B.A. (U. Calif.-Berkeley), Ph.D. (Harv.)
D.W. Middlemiss, B.A., M.A., Ph.D. (Tor.)
D.J. Munton, B.A., M.A. (U.B.C.), Ph.D. (Ohio State)
D.H. Poel, B.A. (Calvin), M.A. (West Michigan), Ph.D. (Iowa)

Assistant Professors
H. Bakvis, B.A. (Hons.) (Queen's), M.A., Ph.D. (U.B.C.)
J. Smith, B.A. (McM.), M.A., Ph.D. (Dal.)

Adjunct Professor
S.K. Holloway, B.A., M.A., Ph.D. (Ohio State)
H. Silverstein, B.A. (Wisc.), M.A., Ph.D. (Graduate School of International Studies, Denver)

Research Assistant
R.G. Purver, B.A., M.A. (U.B.C.), A.M. (Stanford)

"Politics: Who Gets What, When, How" is a definition which captures what is commonly regarded as the essence of politics, and suggests a large part of what political scientists are trying to find out, with varying interests and methods. In pursuit of answers to fundamental questions, political scientists investigate a variety of political problems, whether in one country or compared amongst several. The variety of political science questions is endless.

Attention can be focussed more narrowly on the "policy machine", on international politics where the origins and conduct of the foreign policies of particular states are examined, or on the exercise of power within the nation state.

The emphasis in these various political science pursuits is on the study of politics as actually practised in the world around us. But many political scientists would agree that this is only a first step, and that we should also address ourselves to questions having to do with how politics ought to be. Issues of this sort have been debated by reflective men for thousands of years without easy answers. To consider these sorts of questions is the principal task of political philosophy, which lies at the core of political studies, and of political life.

Students interested in these various fields of inquiry within the discipline of Political Science can find all of them represented in the class offerings and programmes outlined below. Some specialize, others pursue interests in a number of different areas. In either case, the members of the Department are happy to offer whatever advice and assistance they can in the development of any student's personal programme of studies.

Degree Programmes
Students concentrating in Political Science may take a major programme or honours programme. The specific classes to be taken in each individual programme are chosen in consultation with a faculty adviser from the Department in accordance with the general requirements listed below. Undergraduate programmes may emphasize one of the subfields of Political Science or may consist of a general selection of classes from the Department's offerings.

Requirements - Major Programme
In order to meet the requirements of a major programme, a student must take at least four, but no more than eight, classes in political science in addition to an introductory class. All major students should take at least two full classes from among the second-year level offerings and these classes should be selected from at least two sub-fields. A minimum of two additional classes should be taken from third-year level offerings, and will be chosen in consultation with the faculty. Professor J. Smith is the Departmental Coordinator for Major Programmes and is happy to assist students in planning programmes in Political Science.

Honours Programme
An honours programme normally consists of a first-year level class and not less than nine nor more than eleven additional classes in Political Science. Although nine to eleven classes represents the range allowed under the general university regulations, the Department recommends quite strongly that the normal honours programme consist of nine classes past the first-year class, including the honours essay. The intent of this recommendation is to encourage our honours students to take supporting class work in related disciplines.

For the purpose of the honours programme the Department has designated six second-year classes as honours core classes. Five of these core classes represent the political science sub-fields of Canadian politics, comparative politics, political philosophy (two classes) and international politics and the fifth represents the methodological basis for each of the subfields. The six core classes by area are as follows:

Canadian politics: P.S. 2200R Canadian Government and Politics
Comparative politics: P.S. 2300R Comparative Politics
Political philosophy: P.S. 2400 Justice, Law and Morality: Regimes Version
Political philosophy: P.S. 2401 Justice, Law and Morality: Concepts Version
International philosophy: P.S. 2500 World Politics
Methodology: P.S. 2494 Introduction to Political Inquiry

An honours programme in political science includes (i) at least three core classes, of which one must be P.S. 2494 Introduction to Political Inquiry, and another must be *either* P.S. 2400 *or* P.S. 2401; (ii) at least four advanced classes at the third and/or fourth year level, including the honours essay.

The core class requirements are designed (1) to give breadth to the honours programme, (2) to provide all honours students with a grounding in the normative questions of the discipline as well as the foundations of empirical inquiry, and (3) to expose prospective honours students to the various sub-fields that may be chosen for emphasis in individual programmes. Overall, these requirements leave a minimum of two optional credits, which may be taken at the second, third or fourth-year levels.

In the exceptional case of students who have delayed their decision to enroll in an honours programme until late in their third year, or who have decided at the end of their general programme to pursue an Honours Certificate, third-year or higher level classes may be substituted on occasion for one or more of the core classes. Such substitutions, however, must reflect the same distribution of sub-fields within the discipline as is specified by the core-class requirement, and they must have the approval of the Honours Supervisor. Students who think they may eventually pursue an honours degree or certificate are strongly advised to complete their core-class requirements as early in their undergraduate careers as possible.

The honours essay is counted as one credit. It is prepared during the fourth year under the supervision of a faculty member. The essay shows the student's ability to develop a systematic argument with reference to pertinent literature and other such data or analytical materials as may be appropriate. The credit number for the honours essay is P.S. 4600. Informal arrangements are usually made for honours students in the last year to meet with some regularity to discuss and ultimately present the work represented in their essay. A guide for preparing the honours essay is available from the Department Office.

Combined Honours
Several of the more common honours programmes are: Political Science and Philosophy; Political Science and History; Political Science and Economics; Political Science and Sociology. Students interested in taking any of these combined honours programmes or in discussing other possible programmes should consult with the Chairman of the Department or his deputy.

Graduate Studies
The Department offers M.A. and Ph.D. programmes in Political Science, details of which are given in the Calendar of the Faculty of Graduate Studies.

Undergraduate Advisory System
The advisory system in the Department of Political Science is intended to assist students in designing a specific programme in accordance with their interests and the requirements of the Department. Professor J. Smith is the over-all Coordinator of Major Programmes and is assisted by other Departmental members acting as general advisers.

Selection: A student wishing to have a member of the Political Science Department as undergraduate adviser must be either: (a) enrolled in a first-year level class and contemplating a Programme in Political Science (in which case the adviser is normally the instructor of that class) or (b) registered for a programme in Political Science. Upon entering the programme a student may indicate a choice of adviser. Normally the adviser is a faculty member teaching in the student's sub-fields of concentration (if any). The student's choice will be respected unless the member chosen is unable to serve in this capacity. Students who have no preference, but would like nonetheless to have an adviser assigned to them, should consult with Professor Smith.

The advisory relationship may be ended by the student at any time and for any reason. One faculty member may continue to advise the same student throughout his programme.

Role of the Adviser: To be available to the student throughout the year as a consultant on broad academic matters. The adviser is not a tutor with regard to specific classes. Students should consult their advisers with regard to the general structure of their programmes and any proposed course changes.

Classes Offered

Numbering System for Classes
Class descriptions are listed by four-digit numbers under headings
1 Introductory
2 Canadian Government and Politics
3 Comparative Government and Politics
4 Political Theory and Methodology
5 International Politics and Foreign Policy
The first digit of each class number thus indicates year, or level, of class. Except for 1000-level classes, the second digit denotes the sub-field within which the class is listed. Thus P.S. 3540B/5540B is a class open to third-year level and graduate students, in the sub-field International Politics and Foreign Policy, offered during the second term of the academic year.

No student may take more than one first-year level class but some second-year level classes require no prerequisite. The prerequisites listed with each class are intended to show the sort of preparation the instructor anticipates. If no prerequisite is stated for a class, none is required. Admission to classes at and above the third-year level is at the discretion of the instructor who retains the right to judge the suitability of each prospective student's qualifications for the successful completion of the class and his contributions to it.

1. Introductory

1100 Section 1, **Introduction to Political Science,** Lect. 3 hrs.; K.A. Heard.

"Why obey the law?" "Are governments subject to moral restraints?" These are examples of questions discussed in class as an informal introduction to political philosophy. As a bridge between the study of political philosophy and the study of political institutions, the theories and principles of democracy are examined, with references to British political experience. More detailed examination of the constitutions and government of the United States and Canada occupy the remainder (about half) of the session.

1100 Section 2, Introduction to Political Science, Lect. 3 hrs; D. Braybooke.

This class works through two outstanding recent contributions to political science. *Size and Democracy,* by R.A. Dahl and E.R. Tufte; and *Politics and Markets,* by C.E. Lindblom. These books serve to introduce students, not only to some current grand issues in politics, including the opposition of capitalism to socialism, but also to several branches of political science, and the methods used in them.

1101 Section 1, **Introduction to International Politics and Foreign Policy,** Lect. and Intended cussion 3 hrs.; J. Eayrs.to provide a framework for analysis and understanding of

contemporary international events, this class deals with the variety of "actors" in world politics (principally but not exclusively states), and examines some concepts in the field. 1101 is recommended for students planning to take 2500, in their second year.

1103 Section 1, **Introduction to Political Science,** Lect. and discussion 3 hrs.; R. Boardman.

A guide to politics and government in Canada and the United States. Aspects of British, Soviet and other countries' political systems are introduced, and the class begins with a look at some of the perennial issues of political life and democracy.

1103 Section 2, **Introduction to Political Science,** Lect. and discussion 3 hrs.; R.L. Dial.

A comparative study of the institutions, processes, and problems of government in western democracies. Attention is paid mainly, but not exclusively, to the political systems of Great Britain, Canada, and the United States, with emphasis on Canada.

2. Canadian Government and Politics

2200 Canadian Government and Politics, Lect. 3 hrs.; J. Smith. *Prerequisite:* An introductory political science class or instructor's permission.

The class begins by examining the Confederation debate, 1864-67, and then turns to the constitution of the new federation, the British North America Act. Its development via constitutional amendment and the practice of judicial review is studied. A review of the Canada Act, 1982, completes this section of the course. The second section deals with governmental institutions, the Crown, cabinet government and Parliament. The third and final section covers elections, the electoral system and political parties.

2228B Government-Business Relations in Canada, Lect. and discussion 2 hrs.; H. Bakvis. *Prerequisite:* An introductory political science class, or instructor's permission.

The aim of this class is to explore the interaction between business and government in Canada and, more generally, the role of government in economic life. The objectives are to introduce students to the policy instruments deployed by governments to promote and regulate business activities in a market economy; the political values and interests which pertain to such promotion and regulation; and the manner in which the private sector seeks to affect the formulation and implementation of government policy. The class is of interest to Commerce and other students not majoring in political science since many of the topics are approached with a view to their practical importance.

2250 Introduction to Public Administration: Managing the Public Sector. Lect. and discussion 3 hrs.; A.P. Pross.

Today's governments depend on complex organizational machinery to develop policy and to deliver the many services the public requires. This class studies that machinery: how it is built; how it works; how it relates to people, both employees and clients; how it uses different kinds of resources and, above all, how it influences the making of government policy. The principal focus of the class is on the management of Canadian government but comparative material from other Western countries is used frequently.

3204/5204 The Politics, Government and Constitution of Canada, Seminar 2 hrs.; J. Smith. *Prerequisite:* P.S. 2200 or its equivalent with second class standing, or in exceptional circumstances, those with high standing in P.S. 1100, and instructor's permission.

This seminar class examines in some depth important political and constitutional questions in Canada. These include constitutional amendment and the practice of judicial review, cabinet government and the role of Parliament, the electoral system, and political parties. Considerable emphasis is placed on historical investigation and analysis.

3205A/5205A Canadian Political Thought, Seminar 2 hrs.; J. Smith. *Prerequisites:* Class in Canadian Politics or permission of the instructor.

The class examines enduring controversies in Canadian politics as these have been presented in well known speeches, pamphlets and articles by people active in public life. It begins by looking at the Confederation debate, 1864-67, paying particular attention to the framers' concept of federalism and parliamentary as opposed to republican government. It concludes with the debate on these issues that culminated in the 1982 amendments to the constitution.

3208/5208 Canadian Provincial Politics, Lect. and seminar 2 hrs.; D.H. Poel.* *Prerequisite:* P.S. 2200.

An emphasis on cross provincial, empirical research is combined with an interest in the value context of provincial policy. Primary class goals are (1) to stimulate enough interest in provincial politics to develop evaluation research questions and (2) to provide sufficient research skills to permit successful participation in the annual programme evaluation project which is undertaken by the class as a whole.

3212B/5212B The Politics and Government of Nova Scotia, Seminar 2 hrs.; P.C. Aucoin.* *Prerequisite:* Political Science 1100 or its equivalent.

The work of the first term consists of a detailed examination of the Nova Scotian political process since Confederation. In the second term research papers prepared by the class form the basis for analyzing and appraising the functioning of Nova Scotian political institutions. Some time is devoted to federal-Nova Scotian relations. Special attention is paid to the political culture of the province and its effect on the general character of Nova Scotian politics.

3216A/5216A Local and Regional Government, Seminar 2 hrs.; D.M. Cameron.* (Open to graduate and senior undergraduate students.)

The development, organization and operation, and the present legal and fiscal positions of various forms of local and regional government in Canada. Special attention is paid to the city manager system, to the reform of local government, to the special problems of metropolitan government, and to the reliance on special purpose boards and commissions.

3220A/5220A Intergovernmental Relations in Canada, Seminar 2 hrs.; H. Bakvis. *Prerequisite:* P.S. 2200 or permission of the instructor.

A number of topics concerning the territorial division of political power and the relations that have developed between governments are considered.

3221B/5221B Case Studies in Intergovernmental Relations, Seminar 2 hrs.; D.M. Cameron.* *Prerequisite:* P.S. 3220A/5220A or P.S. 3204.

Building on the foundations established in 3220A/5220A, we explore in depth one or several case studies involving relations between governments in Canada. The selection of cases is made at the conclusion of the first term, attempting to accommodate the interests of students as well as taking account of the availability of literature. Students present and defend one or more seminar papers.

3224B/5224B Canadian Political Parties, Lect. and discussion 3 hrs.; H Bakvis.* *Prerequisite:* P.S. 2200 or instructor's permission.

The Canadian party system, viewed as an integral part of the entire political system, presents a number of interesting questions for exploration.

3226A/5226A Pressure Group Politics, Seminar 2 hrs.; A.P. Pross.* *Prerequisite:* An introductory class in political science and a class in Canadian government. Otherwise with the special permission of the instructor.

This class attempts a systematic examination of pressure group politics in Canada and other western countries. It begins by considering the functions pressure groups perform in political systems and then explores the ways in which their structures and behaviour patterns vary across those systems. That discussion leads into an examination of the role of pressure groups in policy

processes and, finally, of the relationship between that role and the prospects for democracy in western politics.

4240/5240 Sections 1 and 2, Policy Formulation in Canada, Seminar 2 hrs.; P. Brown. *Prerequisite:* Intended for 4th-year Honours students, others with instructor's permission.

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 in these areas; 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.

4242B/5242B Science Policy in Canada, Seminar 2 hrs.; P.C. Aucoin.*

4243B/5243B Health Care Policy in Canada, Seminar 2 hrs.; P.C Aucoin.* *Prerequisite:* P.S. 2200 or 3250 or equivalent classes in Canadian government and public policy.

The policies of Canadian governments for the delivery of health care are studied in terms of the roles of the health professions and governmental structures in their formulation and administration. Special attention is given to the process of intergovernmental relations in this policy field and the increasing politicization of health care delivery.

4245B/5245B Urban Policy in Canada, Seminar 2 hrs.; D.M. Cameron.*

4254B/5254B Canadian Public Administration, Seminar 2 hrs.; A.P. Pross.* *Prerequisite:* P.S. 2200 or 3250 or another class in Canadian Government.

The organization of the Government of Canada with particular reference to the administrative process, the structure of the bureaucracy, and its relationship to the political executive are studied in detail.

4258A/5258A Problems in Provincial Public Administration, Seminar 2 hrs.; R. Johnson.* *Prerequisites:* P.S. 2200, 3250, or another class in Canadian Government.

An appreciation of the questions of structure, organization and public policy at the provincial level is developed, using both established literature in the areas and theoretical notions derived elsewhere. An analysis, on a case study basis, of the organization and public policies of provincial governments provides the important appreciation of both the substance and theoretical underpinnings of provincial government activities and organization.

4266A/5266A Natural Resource Administration in Canada, Seminar 2 hrs.; A.P. Pross.* *Prerequisite:* P.S. 2200 or 4240 or permission of the instructor.

The formulation and administration of natural resource policies in Canada are examined with attention to renewable natural resources and a focus on Eastern Canada.

3. Comparative Government and Politics

2300 Comparative Politics, Lect. 2 hrs.; R. Boardman.* *Prerequisite:* An introductory political science class, or instructor's permission.

The methodology and scope of comparative politics, including a comparative analysis of culture, behaviour, and institutions. Topics are approached through studies of a variety of Western liberal democratic, communist, and third world countries.

2305 European Comparative Politics, Lect. and discussion 2 hrs.; R. Boardman.* *Prerequisite:* An introductory political science class, or instructor's permission.

Emphasis is on the three major western countries - France, West Germany and Britain. The political life of other countries is also investigated depending on available time and student interest. Students specializing in comparative politics and students of one or more European languages who are attracted to the study of Europe for other reasons form the intended audience.

2321B Political Behaviour, Lect. and discussion 2 hrs.; D.H. Poel.* *Prerequisite:* An introductory political science class or instructor's permission.

How individuals gather information about, form general orientations toward, and learn to participate (or not to participate) in the polity. Research methods used in analyzing political behaviour form an important secondary consideration.

2330 Politics Through Literature, Lect. and discussion 2 hrs.; R. Dial.* (not restricted to Political Science majors)

What is suggested by THROUGH is a notion that literature is a 'medium' for political understanding or explanation and political learning. During the first term we use a variety of fictional works to dissect key political concepts. In the second term we isolate within literature explanatory theories of complex political situations.

2370 U.S. Government and Politics, Lect. and discussion 3 hrs.; D.H. Poel. *Prerequisite:* An introductory political science class, or instructor's permission.

The class provides a survey of American political institutions, public policies, and public participation in politics. The presidency, Congress and bureaucracy are examined along with the interplay of private interest groups and the role of political parties. Course assignments allow students to pursue individual interests in American politics or public policy.

3301B/5301B Comparative Analysis, Seminar 2 hrs.; R. Boardman and D. Poel.* *Prerequisite:* Open to senior undergraduates with instructor's permission.

The epistemological and methodological questions in the field of comparative politics are examined using several classification schemes for political institutions and behaviour, to ascertain whether comparative analysis can make good a claim to be "scientific". The class is recommended for graduate and honours students.

3303B/5303B Human Rights and Politics, Lect. and discussion 2 hrs.; K.A. Heard. *Prerequisites:* P.S. 1100 or 1103 and, preferably, P.S. 2300, P.S. 2305; P.S. 2400 or P.S. 2401; or with the permission of the instructor.

Issues arising from the claim to rights and from alleged infractions of rights which continue to arouse a great deal of public controversy within individual states and also within the international community are examined by type and by the bases of the claims to such rights. The approach is comparative, and students undertake case studies relating to the general topics.

3304B/5304B Comparative Federalism, Seminar 2 hrs.; H. Bakvis.*

A seminar class which examines the theory and practice of federalism within a comparative framework. The actual federations discussed depends in part on student interest but usually includes both established federal nations and those moving in that direction.

3315B/5315B African Politics, Seminar 2 hrs.; T.M. Shaw. (Intended for students in African Studies and Political Science and can be matched with Political Science 3540A on the Foreign Policies of African States.)

The political economies of several black African states are analysed focussing on the elusiveness of independence and development, examining the variety of responses to the problems of dependence and underdevelopment. Although the concentration is on the countries of east and west Africa, its investigation of several characteristic African phenomena constitutes a general introduction to African government.

3331A/5331A Political Problems in Imaginative Literature, Seminar 2 hrs.; R.L. Dial*.

The imaginative literature of politics, in contrast to the empirical approach, has highlighted the tragic element of political life. One source of the not-so-rare tragic dimension of politics is the attempt to allocate values across cultural systems. This term the class explores the phenomenon of inter-cultural politics in a variety of settings, both historical and contemporary. Political Science 2330, though not a prerequisite, would be desirable background.

3340A/5340A Problems of Development: The Politics of New States, Discussion and seminar 2 hrs.; T. Shaw.*

A survey of theories of and policies about dependence, underdevelopment and peripheral social formations. Particular emphasis on modernisation and materialist modes of analysis, and on orthodox and radical strategies of development. Topics treated include social contradictions (e.g., class, race and ethnicity); industrialisation; self-reliance; Basic Human Needs; ideology, militarism; technology; gender, anarchy; authoritarianism; and decay.

3345A/5345A South Africa: The Dynamics of Political Groups and Group Domination, Seminar 2 hrs.; K.A. Heard. *Prerequisites:* An introductory political science class or instructor's permission.

The class begins with a preliminary discussion of what constitutes a political group, and how and why some groups seek to dominate others. It then examines the modes of White domination in South Africa, the causes of its persistence and the reactions of the subordinate Black peoples of South Africa.

3357A/5357A Chinese Politics: Domestic, Seminar 2 hrs.; R.L. Dia!*.

The various dimensions of the Chinese political process since 1949 are dealt with.

3370/5370 The Theory and Practice of Government in the United States, Lect. and discussion 3 hrs.; Staff.*

Among the themes given special attention are the role of the judiciary and the centralization of authority in the United States.

4. Political Theory and Methodology

2400 Justice, Law and Morality, Regimes Version: The Problem of Regimes in Political Philosophy, Lect. 2 hrs.; R. Eden. (Same as Phil. 227).

This introduction to political philosophy explores the problem of the best regime. Questioning how the media shape our opinions, we discover the problem of the tyranny of the majority. Tocqueville argued that democracy would become a subtle form of Hobbesist tyranny if individualism were not checked. We will trace the origins of this problem to Machiavelli, Hobbes, and Montesquieu and ask why Tocqueville rejected Rousseau's alternative to bourgeouis civil society. Finally we consider the alterative to democracy proposed by Plato and Artistotle.

N.B: This class is complementary to the other version of Justice, Law and Morality. It may be taken for credit before, after, or concurrently with the other class (except that students who took Philosophy 207 or Political Science 2400 before the academic year 1983-84 must satisfy the instructor that they have not already had the version in question). Either class satisfies the minimum requirement in political philosophy for an honours degree in Political Science.

2401 Justice, Law and Morality, Concepts Version: Concepts and Arguments in Political Philosophy, Lecture, 2 hrs.; D. Braybrooke. (Same as Phil. 207)

An introduction to the history of political philosophy, and also to philosophical ethics. In the first

term, the natural law view of justice expressed by St. Thomas confronts the savage realism of Hobbes's *Leviathan.* The concept of justice has had a mixed career since Hobbes's time. In Locke's and Hume's doctrines it is narrowly tied to the defense of property. Sometimes, as with Bentham and Mill, it has appeared redundant; and Marx held that it would be superceded. In our own time, a major effort has been made by John Rawls to restore justice to the central place in ethics. His theory is considered at length at the end of the second term, after examining Lon Fuller's equally contemporary account of the extent to which law must be moral to be genuine.

2402 Representative Government in Theory and Practice, Lect. and discussion 3 hrs.; R. Eden.*

Hamilton pointed out that the science of representative government is a modern discovery from which many of our institutions, and indeed our modern forms of government in general, are derived. In this class we try to recover this science, reconsidering achievements in practice.

2440 The Question of Good in the Technological Age, Lect. and discussion 3 hrs.; G. Grant. (Same as Religion 240.)

The interlocking theoretical and practical issues arising from complex public and private moral decisions in modern technological society are discussed. The conception of "good" expressed in leading political ideologies of the twentieth century is compared with older western conceptions of good prior to the age of progress, and this study is related to specific issues of moral concern.

2455A/5455A Marxist Theory and Its Upshot in the Modern World, Seminar 2 hrs.; S.A.M. Burns. *Prerequisite:* A class in Philosophy or a class in Political Science.

Marxist theory, both as philosophy and as social science, is examined with special emphasis on major writings of Karl Marx.

2494 Introduction to Political Inquiry, Lect. and discussion 3 hrs.; Staff.*

A variety of methods employed in contemporary political analysis to explain political events are analysed critically, including consideration of the general question of the requirements of explanation in political science. Casual explanation and problems in the development and verification of social scientific theory are emphasized. A particular substantive issue unifies discussion of the various methods of explanation and a research project in that issue permits the use of some of the tools of analysis discussed in connection with social scientific theory.

3410/5410 Man, Society and Politics: the Concept of Community, Seminar 3 hrs.; staff.*

3430B/5430B The Political Philosophy of Plato, Seminar 2 hrs.; R. Eden.*

3435A/5435A Machiavellian Politics, Seminar 2 hrs.; R. Eden.*

This seminar explores Machiavelli's contributions to modern politics and political science.

3438B/5438B Rousseau and the Founding of Modern Democracy, Seminar 2 hrs.; R. Eden.*

The origins of modern democracy are explored through a study of Rousseau's political philosophy. Attention is given to Rousseau's defense of democracy against earlier critics, and to his understanding of the founding of a democratic society. Seminar participation constitutes part of the grade.

3451A/5451A The Critique of Democracy in Modern Political Philosophy, Lect. and seminar 3 hrs.; R. Eden.*

An introduction for citizens who wish to reflect critically on the character of representative government, on liberal democracy, and on the kind of commercial republic in which we live in North America, using the works of Montesquieu (who defended the commercial republic) and Nietzsche (who attacked it).

3470B/5470B Futurology and Politics, Seminar 2 hrs.; D. Munton.*

3497A/5497A Research Methods and Data Analysis, Seminar 2 hrs.; Staff.*

A broad, non-technical introduction to the assumptions, procedures, and problems of empirical investigation in political science. The five major stages common to all such research are explored using substantive readings from various sub-fields of the discipline. The major assignment in the class is a research project of the student's own choice and design. A background in statistics or computer programming is unnecessary.

4479B/5479B Classical Liberalism, and Democracy (Seminar in Philosophy, Politics and Economics), 2 hrs.; second term, D. Braybrooke. (Same as Phil. 447B/547B and Econ. 446B/547B.) *Prerequisites:* Previous classes in all three subjects or an advanced undergraduate level in at least one of them. Students taking the class for a credit in philosophy should have had a class in logic (200 or 201 or 202) and one in ethics (310); students taking the class for a credit in political science should have had at least one 3000-level class in political science; students taking the class for credit in economics should have had at least one 330-level class in that subject.

The impact on political philosophy of two leading beliefs characteristic of classical liberalism is covered: first, the belief that good government is strictly limited government; and second, the belief that there is no standard of personal welfare, or of the common good, beyond personal preferences and points on which the preferences of different persons agree.

4480A/5480A Social Choice Theory (Seminar in Philosophy, Politics and Economics), 2 hrs; first term, D. Braybrooke.* (Same as Phil. 448A/548A and Econ. 448A/548A.) *Prerequisites:* The same as for P.S. 4479B/5479B.

Kenneth Arrow's Nobel Prize winning theorem, to the effect that no device of social choice meets an apparently minimal set of weak standards, has seemed to lead two traditions of thought to ruin. One is the theory of voting. The other is welfare economics. After tracing the two traditions that converge in Arrow's theorem, we study the theorem itself and then consider the continuing disarray into which formal social choice theory (and hence the basic theory of democracy) has been thrown by the theorem.

4485B/5485B The Theory of Games as an Approach to the Foundations of Ethics and Politics (Seminar in Philosophy, Politics and Economics), 2 hrs.; spring term, D. Braybrooke.*

The most innovative recent work in ethical theory has applied the theory of games to the perennial problem of the social contract. To what extent can any organized society to which people freely adhere be represented as constituted by rules arrived at by rational agents trying each to arrive at the best bargain about rules with the other agents present? These rules can be regarded simultaneously as the foundation of political organization and as elementary rules of ethics, and a study of this topic forms the basis of the class.

4490B/5490B The Logic of Questions, Policy Analysis and Issue Processing (Seminar in Philosophy, Politics, and Economics), 2 hrs.; spring term, D. Braybrooke.* (Same as Econ. 449B/549B and Phil. 449B/549B.)

4495B/5495B Problems of Quantification, Seminar 2 hrs.; Staff.*

Attention is given to the theoretical foundations of social enquiry, with concentration where possible upon social indicators, and students engage in computer analysis of a small data set, to gain some facility in interpreting statistics to result in a major paper from student's work in either of the two streams.

4496A/5496A Philosophy of the Social Sciences, Seminar 2 hrs.; T. Vinci. *Prerequisites:* A class in research methods or political behaviour and a class in philosophy; or instructor's permission.

A number of philosophers have challenged the application in the social sciences and history of the methods, quantitative and otherwise, used in the natural sciences. The challengers hold that in the study of man and society, different methods are suitable. The extent to which this view rightly calls attention to an important non-quantitative branch of social inquiry is established. The relationship between this branch and the branch or branches of social inquiry in which the example of the natural sciences can be followed is worked out.

5. International Politics and Foreign Policy

2500 World Politics, Lect. and discussion 2 hrs.; J.G. Eayrs.

A continuation of 1101, this class examines techniques of statecraft, surveys the "assaults" upon order, justice and well-being of which the actors of world politics are capable, and explores the available "constraints" upon such actions afforded by international systems and methods. 2500(02) is recommended for students who have taken 1101 in their first year.

2505 International Politics in the Post-War World, Lect. and discussion 3 hrs.; D.W. Stairs.* *Prerequisite:* An introductory class in political science or instructor's permission.

A survey of international politics since World War II with emphasis on politicosecurity issues. Attention is on identifying alternative explanations for these phenomena, which explain issues, and to showing how they are related to different theoretical premises about the nature of international politics and to the kinds of prescriptive remedies that often result.

2510 Canadian External Relations, Lect. and discussion 3 hrs.; D.W. Stairs. *Prerequisite:* An introductory class in political science or instructor's permission.

A general survey of Canadian foreign and defence policies and of the processes by which these policies are made. Some of the persistent pressures and constraints which Canadian policy makers are forced to take into account are examined.

3531A/5531A The United Nations in World Politics, Seminar 2 hrs.; T.M. Shaw.* *Prerequisite:* A class in international politics or with the instructor's permission.

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.

3535B/5535B Towards a New World Order, Seminar 2 hrs.; G. Winham.*

Progress towards, and the elusiveness of, a new world order is described, analysed, and explained. The demands for, and responses to, change in international politics, economics, society and norms are examined. Normative as well as analytic problems are concentrated upon. An advanced class in international politics which requires a concern with, and awareness of, global issues, which is attractive to students of international economics, society and history or with a familiarity with Third World states and problems.

3540A/5540A Foreign Policies of African States, Discussion and seminar 2 hrs.; T.M. Shaw.

An overview of modes and levels of analysis for Africa and of salient cases from that continent; a survey of issues (e.g., intervention, integration, conflict, development, diplomacy, futures) and of examples (e.g., Botswana, Nigeria, Senegal, Tanzania, Zaire and Zimbabwe). Students concentrating on international relations, development studies, or African politics find that this class fits their programmes.

3544B/5544B Conflict and Cooperation in Southern Africa, Lect. and seminar 2 hrs.; T.M. Shaw.*

An introduction to the international relations of Southern Africa, which provides a study of regional political economy with both empirical and theoretical significance. The primary focus is on regional conflict and integration, especially on the liberation movements and regional coalitions.

3570/5570 Canadian Foreign Policy, Seminar 2 hrs.; D.W. Middlemiss. *Prerequisite:* A class in international politics, modern Canadian history, or with the instructor's permission.

The seminar examines post-World War II Canadian foreign policy in three parts: detailed analysis 1. A of major policy developments using the case study approach. 2. An investigation of selected contemporary themes, issues, and problems. 3. A broad analytical overview of factors which help 'explain' the form and content of Canadian policy.

3571/5571 Strategy and Canadian Defence Policy, Seminar 2 hrs.; D.W. Middlemiss. *Prerequisite:* A class in international relations, or the instructor's permission.

This seminar examines post-World War II Canadian defence policy in three parts: 1. An analysis of important cases of policy development. 2. An investigation of certain persistent themes and current issues (e.g. Canada-U.S. defence relations; defence funding; weapons procurement; the role of women in the forces; civil-military relations, etc.). 3. An assessment of the major determinants of policy and prescriptions for the future.

3572/5572 American Foreign Policy, Seminar 2 hrs.; G. Winham. *Prerequisite:* A class in American politics, American history, or international politics, or the instructor's permission.

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. The class is a seminar with regular readings, discussions, and class reports of ancillary readings. One research paper for the year is presented orally in class, and a short essay near the end of each term.

3574B/5574B Chinese Foreign Relations, Seminar 2 hrs.; R.L. Dial.*

China's international behaviour and the policy process shaping that behaviour will be explored through the proposition: "A nation's foreign policy is a device for maximizing external sovereignty and controlling internal interests with external consequences." Prior classes on Chinese politics are not required for this class.

3575B/5575B Nuclear Weapons and Arms Control in World Politics, Seminar 2 hrs.; R. Purver.

An introduction to issues of arms control and disarmament, focussing on nuclear weapons and strategic arms limitations in particular. Technical, historical, doctrinal, and political aspects all will be examined.

3590/5590 The Politics of the Sea, Evening seminar 3 hrs.; E.M. Borgese.

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. There is a great deal of ground to be covered so preference is given to graduates although mature students from other relevant disciplines are welcome.

3596A/5596A Theories of War and Peace, Seminar 2 hrs.; D.W.Middlemiss.* *Prerequisites:* A course in international relations, or the instructor's permission.

This seminar examines critically a broad range of theories regarding the causes, persistence, and termination of organized, collective, international violence. Explanatory factors and evidence will be drawn from the disciplines of anthropology, biology, economics, psychology, sociology and international relations.

4520/5520 Theories of International Relations, Lect. and discussion 2 hrs.; G. Winham.

A brief survey of the discipline of international relations is presented. Three problems of international relations: conflict and war; the nature of economic disparities and imperialism; and the crganization and interaction of nation-states are focussed upon. The class is a study in politics, but course readings are multidisciplinary. Students read the works of historians, economists, social psychologists and the work of political scientists. Students participate regularly in seminars and write a series of essays during the year.

3601/5601 Readings in Political Science, Staff.

A full-year reading class, taught only by special arrangement between individual students and individual instructors.

3602A/5602A Readings in Political Science, Staff.

A first-term reading class, taught only by special arrangement between individual students and individual instructors.

3603B/5603B Readings in Political Science, Staff.

A second-term reading class, taught only by special arrangement between individual students and individual instructors.

4600 Honours Essay

Psychology

Chairperson of Department
R.S. Rodger

Professors
M. Cynader, B.Sc. (McG.), Ph.D. (M.I.T.)
P.J. Dunham, M.A., Ph.D. (Missouri)
J.C. Fentress, B.A. (Amherst), Ph.D. (Cantab.)
D.O. Hebb, B.A. (Dal.), M.A. (McG.), Ph.D. (Harvard), D.Sc., D.H.L., LL.D. *Honorary Professor*
W.K. Honig, B.A. (Swarthmore), Ph.D. (Duke)
V.M. LoLordo, A.B. (Brown), Ph.D. (Penn.) - *Graduate Studies Coordinator*
J.A. McNulty, M.A., Ph.D. (Tor.)
D.E. Mitchell, B.Sc., M.App.Sc. (Melb.), Ph.D. (Berkeley)
S. Nakajima, B.A. (Chiba), M.A. (Wash.), Ph.D. (McG.)
D.M. Regan, B.Sc., M.Sc., Ph.D., D.I.C., D.Sc. (Lond.) (Honorary Professor and Director of Centre for Research in Sensory Psychology and Medical Physics)
K.E. Renner, B.S. (Penn.), M.A., Ph.D. (Northwest)
R.S. Rodger, M.A. (Edin.), Ph.D. (Belf.)
M.G. Yoon, B.S. (Seoul), Ph.D. (Berkeley)

Associate Professors
J. Barresi, B.Sc. (Brown), M.A. (S.Calif.), Ph.D. (Wisconsin)
K. Bloom, B.Sc. (Loyola), M.A., Ph.D. (N.Car.)
R.E. Brown, B.Sc. (Victoria), M.A., Ph.D. (Dal.)
J.W. Clark, M.A. (McG.), Ph.D. (Qu.)
B. Earhard, B.A., M.A., Ph.D. (Tor.)
R. Klein, B.A. (S.U.N.Y.), M.A., Ph.D. (Oregon)
I.A. Meinertzhagen, B.Sc. (Aberdeen), Ph.D. (St. Andrews)
B.R. Moore, A.B. (Emory), Ph.D. (Stan.)
M. Ozier, M.A., Ph.D. (Tor.)
R.L. Rudolph, M.A. (DePauw), Ph.D. (N.Car.)
B. Rusak, B.A. (Tor.), Ph.D. (Berkeley)
S.R. Shaw, B.Sc. (Lond.), Ph.D. (St. Andrews)

Assistant Professors
S. Bryson, B.A. (Guelph), Ph.D. (McG.)
J. Werker, B.A. (Radcliffe), M.A., Ph.D. (U.B.C.)

NSERC University Research Fellows
R. Croll, B.Sc. (Tufts), Ph.D. (McGill)
M. Spetch, B.A., M.A., Ph.D. (U.B.C.)
D. Treit, B.A., M.A., Ph.D. (U.B.C.)

Postdoctoral Fellows
C. Baker, K. Berridge, J. Gardner, J. Kruse, J. Matsubara, D. Phillips, C. Shaw, N Swindale

Research Associates
P. Dodd, A. Fröhlich, M. Kaye

Senior Instructors
R. Hoffman, L. White

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.

Degree Programmes

B.A. or B.Sc.
Students enrolled in the bachelor's (i.e., three-year) programme must take at least four and no more than eight full credits beyond the introductory level in their area of concentration. Required classes for students who intend to major in Psychology are listed below. Although there is considerable freedom of choice, it is important for the prospective major to plan ahead carefully. If you need advice planning your programme, see Dr. J. Clark, Dr. R. Brown, or Dr. R. Rudolph.

Requirements for a bachelor's degree:
1. Psychology 1000 or Psychology 1010
2. Psychology 2000A
3. At least three more 2000-level classes (either full or half credits)
4. At least two more full credits in Psychology from 3000-level classes, one of which is a laboratory class.

B.A. or B.Sc. with Honours in Psychology (Major Programme).
Students enrolled in the major honours programme must take at least nine and no more than eleven full credits beyond the introductory level in their area of concentration. Requirements for the Honours Degree in Psychology are listed below.

It is recommended that students in this programme take 2000A and 2500B and as many classes from the core programme (see requirement 3 below) as possible in the second year. Honours students are advised to complete Psychology 3500 prior to the fourth year. 4000-level seminars may be taken in the third and fourth years. 2000 or 3000 level classes may be taken at any time provided that the student meets the necessary prerequisites.

Although there is considerable flexibility for the student, it is important to plan carefully (this is especially true for those considering graduate work in Psychology). If you need advice in planning your programme, see Dr. R. Brown or Dr. R. Rudolph.

Requirements for an Honours Degree in Psychology:
1. Psychology 1000 or Psychology 1010
2. Psychology 2000A and Psychology 2500B
3. At least four more 2000-level classes (either full or half credits).
4. Psychology 3500.
5. At least two full credit classes at the 3000-level, one of which is a laboratory class.
6. Psychology 4500 (Honours Thesis)
7. At least one full credit of 4000-level seminars
8. At least one more full credit of Psychology at or beyond the 3000-level.

Combined Honours
It is possible for students to take an honours degree combining psychology with a related arts or science subject. In such a combined honours programme the student must take eleven full credits beyond the 1000-level in two areas of specialization, with not more than seven full credits in either area. The student in the combined honours programme normally writes a thesis (or the equivalent) in the elective major area in which the majority of classes are taken. Any student intending to take a combined honours degree should consult with the two respective departments to arrange programme details.

Other Programmes

A variety of other programmes are available in cooperation with other departments. These programmes are designed to meet the needs of students whose specific interests may lie in areas other than those covered by the major and honours programmes offered by the department. Interested students should contact Dr. R. Rudolph or Dr. R. Brown for further information.

Financial Aids
Teaching assistantships, Research Assistantships, and NSERC Summer Student Fellowships are available, during both the academic term and the summer vacation, to students who are taking an honours degree in psychology. Details of these assistantships and of the stipends may be obtained from Dr. R. Brown or Dr. R. Rudolph.

1000 (100) Introduction to Psychology, Lect. 3 hrs.; Staff.

Students interested in the biological and social bases of behaviour in both men 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 in man, how they operate, and how they are affected by disorders of the brain; of the way in which hereditary and environmental factors interlock to produce these complex sequences of behaviour which distinguish one species from another; of the way in which children learn their native language; of how the form of an animal society can be predicted from a knowledge of a limited number of ecological facts. Psychology 1000 meets three hours a week for lectures. The grade is based on a number of examinations given at intervals throughout the year.

1010 (101) Introduction to Psychology, Tutorials 3 hrs; Staff.

The content of Psychology 1010 is similar to that of Psychology 1000 but the manner of teaching differs. In Psychology 1010 there is neither a fixed pace for covering the content of the class, nor regularly scheduled lectures. Instead, students work through the readings at their own pace, and, when they think that they have mastered a unit of the readings, attend an individual tutorial. The tutorial consists of a brief test on the readings followed by a review of the test and a discussion with the tutor. If the tutor judges the student's understanding of the unit to be inadequate, the student returns for another tutorial on the unit after additional preparation. Tests on a unit of work may be re-written until understanding is achieved and demonstrated. The grade for the class is based on the number of units passed by the end of the year.

2000A (200A) Methods in Experimental Psychology, Lect. 2 hrs.; Lab. 2 hrs.; P. Dunham and other members of the department. *P* erequisite: Psychology 1000 or 1010.

An introduction to the methodological tools which have been developed by research psychologists to study behaviour. In lectures, we proceed from a discussion of the general problem of applying the scientific method to the study of behaviour to more specific procedures used by psychologists in studying various aspects of animal and human behaviour. The laboratory work consists of a series of projects illustrating some of the more important techniques discussed.

2020 (202) A or B Psychological Aspects of Social Issues, Lect. 3 hrs.; K.E. Renner. *Prerequisite:* Psychology 1000 or 1010.

Most of the important social issues of our time have implications for human adjustment, for the forms of our social institutions, and for the relationships between people and between people and their institutions. Topics vary according to current issues. Selected topics are examined in greater detail to provide a context for formulating general psychological concepts and theoretical issues. The logical implications of the analysis for prescriptions for the future are pursued.

2030 (203) Psychological Measurement, Lect. 3 hrs.; R.S. Rodger. *Prerequisite:* Psychology 1000 or 1010.

After some of the abstract properties of measurement systems are described, aspects of psychological measurement are discussed. Further elaboration of measurement procedures in Psychology requires a knowledge of statistical theory. The required amount of this theory is given and used in the context of signal detection theory and the analysis of data from paired comparison experiments. The class ends with consideration of mental test technology. Exercises are scheduled regularly for students to do out of class. A knowledge of higher mathematics is not required: high school arithmetic and algebra are generally sufficient.

2070 (207) Introduction to Neurosciences, Lect. 3 hrs.; I.A. Meinertzhagen. *P* erequisite: Psychology 1000 or 1010 or with consent of the instructor. For those not having Psychology 1000 or 1010, Biology 1000 and 2020 would be advantageous.

Neuroscience is the newly evolving interdisciplinary field which aims to integrate findings in many diverse areas of brain research into a single systematic framework. This class introduces a number of aspects of this field emphasizing analyses which are precise at the neuronal level. A general introduction is provided by the vertebrate visual system, followed by analysis of the structure and function of neurons, including the ionic basis of their electrical activity and the neurochemistry of synaptic transmission between neurons, aspects of drug action, the control of activity in the motor nervous system and examples of the integration and development of nerve cells.

***2080 (208) A or B Social Psychology,** Lect. 3 hrs.; J.W. Clark. *Prerequisite:* Psychology 1000 or 1010.

Some major issues in social psychology are introduced through a critical analysis of theories and research in which the behaviour of the individual is seen as a product of the social context. The student reads papers on such topics as helping, obeying, oppressing, liking and hating. Questions on those papers are to be answered out of class and submitted at intervals throughout the term. The lectures are intended to promote a close and sceptical evaluation of the readings.

2090 (209) A or B Developmental Psychology, Lect. 3 hrs.; J. Werker. *Prerequisite:* Psychology 1000 or 1010.

The origins of human behavioural development from a biological and psychological perspective.

2120 (201) A or B Clinical Psychology, Lect. 3 hrs.; Staff. *Prerequisite:* Psychology 1000 or 1010. *Restriction:* This class may **not** be taken concurrently with Psychology 3120.

Different approaches taken in the field of clinical psychology, both theoretical and applied, are introduced. As the primary focus of clinical psychology is abnormal human behaviour, considerable time is devoted to the problem of defining the concepts of "mental illness", "psychopathology", and "abnormal" behaviour. A broad overview of intervention programmes ("therapies") is provided.

2130 (213) A or B Information Processing, Lect. 3 hrs.; B. Earhard. *Prerequisite:* Psychology 1000 or 1010.

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.

2140 (214) A or B Learning, Lect. 3 hrs.; V. LoLordo. *Prerequisite:* Psychology 1000 or 1010.

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 of 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.

2150 (215) A or B Perceptual Processes, Lect. 3 hrs.; J. McNulty. *Prerequisite:* Psychology 1000 or 1010 or Biology 1000.

Perception deals with the way in which our senses provide us with information about our environment. This class focusses on the process by which sensory experiences are coded, how they are interpreted by the nervous system, and how experience modifies perception.

2160 (216) A or B Animal Behaviour, Lect. 3 hrs.; B.R. Moore. *Prerequisite:* Psychology 1000 or 1010 or Biology 1000.

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, chimpanzees and various birds.

2170 (217) A or B Hormones and Behaviour, Lect. 3 hrs.; R.E. Brown. *Prerequisite:* Psychology 1000 or 1010 or Biology 1000.

Endocrinological basis 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.

2270 (227) A or B Human Neuropsychology, Lect. 3 hrs.; S.R. Shaw. *Prerequisite:* Psychology 1000 or 1010.

This class explores the organization of the human brain and its support systems, attempting to explain the complexity of both normal and abnormal function, as revealed by the consequences of accidents, defects, and surgical intervention, as well as animal models. Emphasis throughout is placed on trying to understand the mechanisms underlying phenomena. Aphasia, epilepsy, the involvement of certain brain chemicals in behaviour, cerebral asymmetry, the potential for neural prostheses, the dispute over localization of function in the brain are examples of topics covered.

2500 (210) B Contemporary Research Problems in Psychology, Lab. 3 hrs.; P. Dunham. *Prerequisite:* Psychology 1000 or 1010 and 2000A.

Primarily for honours students as a continuation of Psychology 2000A. It consists of working through a research problem with the instructor on a one to one basis. At the end of the year, the student completes an independent experiment and submits a written report of the data. Students other than honours students may take the class with the permission of the instructor.

3000 (300) Independent Research in Modern Psychology, Laboratory 4 hrs.; Staff. *Prerequisites:* Psychology 2000 and previous or concurrent enrollment in two other 3000-level classes; and the prior consent of the instructor.

Primarily for students wishing further experience and understanding of psychological research. A student in the class chooses a member of staff who serves as his class adviser throughout the academic year, under whose supervision independent research is conducted.

3010 (301) Advanced General Psychology, 3 hrs. with additional meetings with the instructor; R. Rudolph and W.K. Honig. *Prerequisites:* The consent of the instructor, Psychology 2000, and at least concurrent registration in two other 3000-level psychology classes.

For the advanced student, a review of general psychology with the aim of consolidating the student's knowledge of the foundation. The method is unconventional. With the assistance of the instructors, the student prepares the material assigned to Psychology 1010 at a level which enables him to instruct introductory students in individual tutorials. The grade is based on two examinations. Students should consult with the instructors in the spring in order to begin preparation before classes start in the fall.

3020 (322) Community Psychology, Lect. 1 hr.; Lab. 2 hrs.; K.E. Renner. *Prerequisites:* Psychology 1000 or 1010 and 2000, and 2020.

A cooperative relationship is established with local community and social action groups in which current issues or problems become the focal point for a field laboratory course. Topics vary from year to year. Classroom work centres on concepts of community psychology and on teaching field research skills and techniques.

3040 (304) Learning and Motivation, Lect. 2 hrs.; Lab. 2 hrs.; B.R. Moore. *Prerequisite:* Psychology 2000 and 2140.

An examination in detail of a few selected topics within the field of learning and conditioning. The emphasis is on identification and clarification of fundamental processes, their boundaries, biological significance and evolutionary history. Conventional wisdom is accepted only as a last resort. We work from original papers and monographs rather than secondary sources. After suitable preparation, students move toward guided original research on questions arising from readings and discussion. The first half of the course, approximately, is a seminar; the remainder is research.

3050 (305) Perception, Lect. 2 hrs.; Lab. 3 hrs.; D.E. Mitchell. *Prerequisite:* Psychology 2000.

Psychology 3050 considers the way in which information about the world is provided by the senses and how we use this information in our behaviour. The material falls into four sections. 1. The methodological and theoretical problems peculiar to the study of sensation and perception; 2. The transformation of physical stimulus energy into neural energy; 3. The physiological and psychophysical analysis of the sensory systems with particular emphasis on vision; and 4. The development of perception and its relation to the anatomical and physiological development of the sensory pathways. The experimental work has been selected for its importance in the theoretical understanding of perceptual processes and consists of a general introduction to the apparatus and methods used in perceptual research.

3070 (307) Physiological Psychology, Lect. 2 hrs.; Lab. 3 hrs.; S. Nakajima. *Prerequisite:* Psychology 2000 or the permission of the instructor.

Physiological psychology is concerned with the biological explanation of psychological phenomena such as perception, motivation, learning and memory. Students should have a working knowledge of concepts and methods in experimental psychology. Emphasis is on psychological issues with the answers sought in physiological terms. As an alternative to the laboratory section, students may elect to write an extensive review paper on a topic to be agreed upon by the instructor.

3080 (308) Experimental Social Psychology, Lect. 3 hrs.; Lab. 1 hr.; J. Barresi. *Prerequisite:* Psychology 2000.

The study of individual behaviour as a function of social stimuli with emphasis on extensive student research projects and class presentations. The class develops from discussion of research designs and methods to the study of basic processes such as person perception, social comparison, and social influence, including behaviour within groups and the relations between them.

3090 (309) Early Development, Lect. 2 hrs.; Fieldwork 2 hrs.; K. Bloom. *Prerequisite:* Psychology 2000.

This class is designed to study human development from conception through the first years of life. Emphasis is on biosocial influences on development within an evolutionary perspective. The significance of the prenatal period, birth, the first attachment, early perceptual and cognitive abilities, and the emergence of communicative functions are considered.

3120 (312) Issues in Clinical Psychology, Lect. 2 hrs.; Seminars 2 hrs.; S. Bryson. *Prerequisite:* Psychology 2120 or permission of instructor.

As with most areas of any science sacred cows roam at large in the field of clinical psychology. The purpose of this class is to sit on the horns of the dilemmas and slaughter the beasts. A second goal is to learn how to present, listen, and participate in seminars. The issues include such topics as altered states of consciousness, concepts of intelligence, approaches to psychological testing, theories of schizophrenia, theories of therapies, women and madness, death.

3130 (313) Cognitive Processes, Lect. 2 hrs.; Lab. 2 hrs.; R. Klein. *Prerequisites:* Psychology 2000, and either 2130, 2150, or 2270 or consent of instructor.

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 focusses not only on what is known about human cognition, but also on techniques cognitive scientists have developed to uncover this knowledge.

3160 (364) Ethology, Lect. 2 hrs.; Lab. 2 hrs.; J. Fentress. *Prerequisites:* Psychology 1000 or 1010 and 2000A or Biology 1000.

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 in naturalistic and experimental situations are presented. 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).

***3190 (319) Psychology of Language,** Lect. 3 hrs.; J. Werker. *Prerequisite:* Psychology 1000 or 1010 and some background in information processing is suggested. Enrollment is limited to 3rd and 4th year students or by special permission of the instructor.

The ability to translate complex ideas into a string of words which can then be understood by a listener is quite an accomplishment. Yet, nearly every human acquires this ability within the first few years of life. The psychology of language explores questions on this topic through a combination of lectures, demonstrations, and student research projects.

3260 (360) A or B Biological Rhythms, Lect. 3 hrs.; B. Rusak. *Prerequisite:* Psychology 1000 or 1010 or Biology 1000.

Virtually all physiological and behavioural parameters in animals and humans are rhythmic. Rhythms of critical interest are those that correspond to major geophysical cycles: daily, lunar, and annual rhythms. Research in this area ranges from studies of cell biochemistry to studies of star-map orientation; a broad introduction to this highly interdisciplinary subject is presented.

3270 (350) A or B Developmental Neuroscience, Lect. 3 hrs.; M. Yoon. *Prerequisite:* Psychology 2070 or consent of instructor.

For those interested in the development of the structures and functions of the nervous system. The class introduces three main aspects: (1) Embryonic development of the nervous system; primary morphogenetic movements of cells, birth of neurones and neuroglial cells, and migration of neurones to specific places in the nervous systems. (2) Formation of functional interconnections among neural elements; synaptogenesis, topographic patterns of neural connections, synaptic organizations of various parts of the nervous systems. (3) Specificity and plasticity in regeneration or reorganization of the neural connections following various experimental manipulations of the nervous system.

***3360 (336) A or B Human Sociobiology,** Lect. 3 hrs.; Staff. *Prerequisite:* Psychology 1000 or 1010 and 2000A.

Some differences in behaviour may be heritable, just as some physical differences are. Insofar as this is true, these behavioural differences are subject to both natural and sexual selection. Sociobiology aims to understand how the behaviour of animals and men has evolved in response to these selective pressures. An introduction to the central questions of sociobiology.

3370 (351) A or B Neuroscience Laboratory, Lab. 3 hrs.; S.R. Shaw. *Prerequisite:* Psychology 2000A and 2070 or 3270A.

An introduction to several techniques used in contemporary neuroscience. Regularly scheduled labs with students working in pairs under supervision are supplemented by occasional lectures. Program aims at familiarizing students with electrical stimulating and recording methods and related techniques, and currently uses both sensory and motor nerve preparations. Structural analysis of the nervous system is introduced by way of Golgi neuroanatomy, and electro-microscopy of visual system or CNS.

3460 A or B Behavioural Ecology, Lect. 2 hrs.; Seminar 1 hr.; J. Fentress, M. Rose. *Prerequisite:* Psychology 1000 or 1010 or Biology 1000. This class is cross-listed as Biology 3062 (A or B).

3500 (357) Statistical Methods in Psychology, Lect. 2 hrs.; Practicum 2 hrs.; K. Bloom. *Prerequisite:* This class is primarily intended for honours students, but other students are admitted with the consent of the instructor.

This class enables students to understand parametric and nonparametric statistical procedures and their application to research in psychology. In addition the student learns to execute "packaged" computer programs for data orgnaization, description, modification and analysis. Classes include lectures, seminars and labs.

4000 Level Seminars:

These seminars (4000-4580) are intended for 3rd and 4th year honours students (others may enroll in these classes only with special permission of the instructor). The topics covered in these classes vary from year to year. Consult the department for the specific course descriptions.

4000 Senior Seminar, 2 hrs.; Staff.

***4040 (404) A or B Applications of Conditioning and Learning,** 2 hrs.; V.M. LoLordo. Topics vary from year to year. Future topics: 1. Clinical and social applications of learning principles; 2. Pain, fear, and stress.

***4050 (405) A or B Topics in Perception,** 2 hrs.; D. Mitchell.

***4070 (440) A or B Neuroscience Seminar,** 2 hrs.; M.G. Yoon. *Prerequisites:* Psychology 2070 and 3270, or consent of the instructor.

***4080 (408) A or B Topics in Social Psychology,** 2 hrs.; J. Barresi.

Recent developments in Artificial Intelligence, Neuroscience, Philosophy, and Psychology suggest that the development of a full-blown theory — a mechanical analogue — of man is going to be a difficult, if not impossible, task. In this seminar we attempt to evaluate whether it is possible to develop a complete scientific psychology of persons — one which accounts fully for consciousness, self-consciousness, and the sense of freedom and moral responsibility for our actions. The approach is synthetic, theoretical and interdisciplinary; not analytic and empirical.

***4090 (409) A or B Development of Social Behaviour,** 2 hrs.; K. Bloom.

***4120 (432) A or B Topics in Clinical Psychology,** 2 hrs.; S. Bryson.

***4130 (413) A or B Topics in Human Information Processing,** 2 hrs.; M. Ozier.

***4140 (416) A or B Animal Learning Topics,** 2 hrs.; W.K. Honig.

This is a seminar in which selected topics in animal learning are reviewed in some detail. The emphasis is on cognitive aspects of learning. The class is a seminar or a directed study, and may involve participation in research.

***4160 (417) A or B Topics in Behavioural Biology,** 2 hrs.; B. Rusak.

***4230 (423) A or B Human Performance Topics,** 2 hrs.; J. McNulty.

***4440 (444) A or B Topics in Cognitive Development,** 2 hrs.; Staff.

4500 (465) Honours Thesis, Members of the Department. *Prerequisites:* Restricted to honours students in their graduating year.

The purpose is to acquaint the student with current experimental problems and research procedures in experimental psychology. 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. Each student must submit a formal report of the completed research. The final grade is based upon the originality and skill displayed in designing the project and upon the submitted report.

4580 (458) History of Psychology, Seminar 2 hrs; J.W. Clark. *Prerequisites:* Restricted to honours students. *Preparatory reading:* It would be advantageous to read E.G. Boring's *History of Experimental Psychology* before the class starts.

The evolution of thought about some psychological issues that have been of central concern throughout man's intellectual history. The understanding of such issues is traced in the writings of the major contributors from antiquity to the emergence of experimental psychology in the nineteenth century, and their development is examined in the work of psychologists in the early years of this century.

Religion

Professor
R. Ravindra, B.Sc., M.Tech., (I.I.T.), M.A. (Dal.), M.Sc., Ph.D. (Tor.), (Chairperson)

Associate Professor
C.T. Sinclair-Faulkner, B.A. (Tor.), M.Th., M.A., Ph.D. (Chic.)

Adjunct Professor
W.C. Smith (Harvard)

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 courses described below.

B.A.
Students wishing to major in Religion must successfully complete Religion 1010 or 1301, and at least four classes in Religion beyond the 1000 level. This provides them with a broad introduction to both Eastern and Western religious life, and to the various ways in which religion may be studied. In the light of their specific interests, Religion majors are encouraged to enroll in related classes offered by other Departments. Programmes should be planned in consultation with the undergraduate adviser, Dr. C.T. Sinclair-Faulkner.

Please consult the current timetable on registration to determine which class is offered.

1010/2010 Love in World Religions, Lecture and seminar 3 hrs.; R. Ravindra (no prerequisite).

What is love? Why is something so universal and important also so problematic? Is it possible to love in the midst of intense suffering and hatred? Various aspects of love and related feelings, such as eros, agapé, compassion and mercy, are studied in this class from the perspective of major religions. Material is drawn from many sources such as the *Song of Songs*, *Love Song of the Dark Lord*, mystical poems of St. John of the Cross, Kabir, and others. A detailed syllabus is available from the Department of Religion.

1301 Introduction to the Study of Religion, Lecture 2 hrs.; section meeting 1 hr.; C.T. Sinclair-Faulkner.

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 Religion.

2020 Death and Afterlife in World Religions, Lecture and seminar 3 hrs.; R. Ravindra. *Prerequisite:* None; available to first year students.

What is death? 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 judgement after life? Is there re-incarnation? These questions will be discussed on the basis of material drawn from major religions in a comparative perspective. A detailed syllabus is available from the Department of Religion.

2101 Western Spirituality, Lecture and seminar 2 hrs.; C.T. Sinclair-Faulkner.

The Western world has known many different ways to be religious: personal, mystical, political, rational, sensual. Original accounts of Jewish, Christian, Muslim and pagan spiritualities are studied in their historical context. Each student undertakes a guided study of some twentieth-century religious experience of his or her choice. A detailed syllabus is available from the Department of Religion.

2202 Religion and Culture in India, Lecture and seminar 3 hrs.; R. Ravindra. (No prerequisite; available to first-year students.)

An introduction to the rich variety of spiritual and religious expressions in the vast culture of India. Some of the major ideas, practices and gods are discussed; their continuity as well as radical departure from them in the development of Buddhism, and in their encounter with Islam and later with Christianity in India will be examined. The second term is devoted to an intensive study of the *Bhagavad Gita* and its relevance to modern life.

2303 Religion in Story, Lecture and seminar 3 hrs.; C.T. Sinclair-Faulkner.

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. Moden 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 and *The Pilgrim's Progress*. A detailed syllabus is available from the Department of Religion.

2040 Comparative Study of Christianity and Other Religions, Lecture and tutorial 3 hrs.; R. Ravindra (no prerequisites).

The task of the comparativist is difficult and challenging, demanding integrity, empathy and

self-critical awareness. It is also a radical task, calling into question the very roots of other traditions as well as of one's own. The first half of the class asks fundamental general questions: What materials in different traditions are comparable? What psychological and intellectual attitudes are required for such a study? The second half is devoted to a comparative study of the *Bhagavad Gita* and the four gospels, particularly around the themes of love, knowledge and action.

2030 Religious Myths, Symbols, and Rites, Lecture and seminar 3 hrs.; R. Ravindra. (No prerequisites; available to first-year students.)

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 understanding, the focus is on the major myths and symbols associated with the lives and activities of Krishna, Gautama Buddha and Jesus Christ. There is also a comparative look at the traditional rites connected with a Hindu and a Christian wedding, and the different world views implied in these ceremonies.

2121 Religion in Canada, Lecture and seminar 3 hrs.; C.T. Sinclair-Faulkner.

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 sixteenth century to the present, a variety of answers will be explored. A detailed syllabus is available from the Department of Religion.

2440 The Question of Good in the Technological Age, Lecture and seminar 3 hrs.; George P. Grant. (Same as Political Science 2440.)

Technology has introduced many novel, practical solutions into our society; it has also fundamentally put in question what we mean by such words as "good", "just", etc. In this class we discuss how we come to clarity among these interlocking theoretical and practical issues.

2531 Mystical Consciousness and Modern Science, Seminar 2 hrs.; R. Ravindra. *Prerequisite:* A class in Religion or in Science (preferably both).

Yoga, Zen, Prayer of the Heart, Sufism and other spiritual disciplines have gathered an enormous amount of experiential and theoretical material about human consciousness and its many levels, from the ordinary to the mystical and cosmic. The first term is devoted to developing a typology of human consciousness based on these disciplines. The second term is devoted to a critical examination of this typology 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.

3500 Rise of Science and the Modern World, Lecture and seminar 3 hrs.; R. Ravindra and J. Farley. (Same as Physics 340, History 3700 or Biology 3400.)

After studying the rise and nature of modern science, the second term is devoted to some issues between science and religion in the modern world.

3310A/5310A - 3320B/5320B Topics in Religion, Seminar 2 hrs.; Staff.

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, such as *Cults and New Religions*, *The Feminine in World Religions*, *Religious Aspects of Middle-East Politics*, *Tradition and Modernity*, etc. Please consult the Department for the topic which may be discussed in any given term.

Russian

Professor
Y.Y. Glazov, Ph.D. (Oriental Inst.), F, (Moscow)

Assistant Professors
J.A. Barnstead, B.A. (Oakland), A.M. (Harv.)
I. Vitins, B.A. (Mich.), Ph.D. (Calif.) (Chairman)

The Russian Department offers classes in Russian language, literature, and culture. Since the Soviet Union 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. Students in the sciences and mathematics find Russian especially useful, as it can give them a lead of six months to a year over those who must wait for journals to be translated.

In the language classes emphasis is placed on gaining a thorough grasp of Russian grammar and an extensive speaking, reading, and writing vocabulary. Late afternoon classes are offered in some courses to accommodate students who are unable to attend lectures in the day-time.

One of the richest areas of Russian life is its literature. Dostoevsky, Tolstoy, Chekhov, Pasternak, Solzhenitsyn and many other Russian writers have made fascinating contributions to world culture. Classes in Russian literature are generally offered in English and in Russian in order to give as many students as possible the opportunity to become acquainted with its masterpieces.

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.

Major or honours students may, with the approval of the Department of Russian, take up to one year (5 full credits) of work at a University in a Russian-speaking country and receive credit at Dalhousie.

Degree Programmes:

Classes in the Russian Department are open to students either (1) as electives in any degree programme; or (2) as constituents of a major or honours degree in Russian; or (3) with classes in another foreign language forming parts of a combined honours degree.

Classes Offered

100 Elementary Russian, Lect. 4 hrs.; no prerequisites.

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.

105 Scientific Russian, Lect. 3 hrs.; No prerequisites.

This class provides a knowledge of Russian grammar sufficient to read technical materials with the aid of a dictionary and covers rudiments of pronunciation. In the second semester the student is introduced to the specialized vocabulary of his particular field. This class does not qualify students to take Russian 200.

200 Intermediate Russian, Lect. 4 hrs. *Prerequisite:* Russian 100 or equivalent.

A continuation of Russian 100. Oral and reading skills and a further knowledge of grammar are developed through the study of Russian texts.

202A Russian Literature and Culture, Lect. and discussion 2 hrs.; no prerequisites. Conducted in English.

The class traces developments in classical Russian literature, as well as in the Russian arts: painting, sculpture, theatre, and music. Religious and secular ideas of 19th century Russia are also discussed.

205 Survey of Russian Literature, Lect. 2 hrs.; no prerequisites. Conducted in English.

The first half of this class concentrates on the outstanding writers of the nineteenth century, including Pushkin, Gogol, Dostoevsky, Turgenev, and Tolstoy. The second half of the class is devoted to the study of such authors as Chekhov, Gorky, and such leading post-revolutionary writers and poets as Mayakovsky, Sholokhov, Pasternak, and Solzhenitsyn.

207A Russian Literature and Culture after Stalin's Death, Lect. and discussion 2 hrs.; no prerequistes. Conducted in English.

The literary, cultural, and political history of Russia after Stalin's death in 1953. Among the major issues considered are the significance of Stalin's death, the "Thaw" and de-Stalinization, Pasternak, Solzhenitsyn, Nadezhda Mandelstam and Sakharov. Revival of the intelligentsia and religious trends. Relationships of Russia and the West. Official and non-official culture.

224A/B Theories of Literature, Lect. and discussion 2 hrs.; no prerequisites. Conducted in English.

This class surveys Russian thought about literature from mediaeval times to the end of the nineteenth century, then concentrates on a more detailed study of twentieth century theories.

Emphasis is on the complex interrelationships of modern Russian theories of literature with their Western counterparts, e.g. Formalism and American "New Criticism". Topics treated include formalism, early Marxist criticism, Socialist Realism, post-Stalin Marxist criticism, Structuralism, and Tartu School of semiotics. Student discussions and papers apply the principles of a given school to practical criticism of works of their choice, demonstrating the strengths and weaknesses of each theory.

234A/B Russian Modernism, Lect. and discussion 2 hrs.; no prerequisites. 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.

250A/B Tolstoy, Lect. and discussion 2 hrs.; no prerequisites. Conducted in English.

An introduction to the work of this enigmatic spiritual giant of Russian literature; the impact of his philosophy and writing on world literature and thought. Reading includes the epic *War and Peace*, *Anna Karenina*, and the controversial *Kreutzer Sonata*.

252A/B Chekhov and Turgenev, Lect. and discussion 2 hrs.; no prerequisites. 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 Russian, and Chekhov, unequaled short-story writer and radical innovator in modern theatre. Reading includes: *First Love*, *Fathers and Sons*, *In the Ravine*, *Ward No. 6*, and *Cherry Orchard*.

260A/B Russian Satire and Humour, Lect. and discussion 2 hrs.; no prerequisites. Conducted in English

Russian satirical and humourous literature written within the last two centuries. Russian satire and humour have made a great contribution to the world's treasures in this genre. Students read masterpieces by Gogol (*Dead Souls*) and Dostoevsky (*The Devils*). Lectures cover some of the immortal comedies of Russian literature and the early humourous stories of Chekhov. For the period after the 1917 Revolution stories by Soviet satirists, including Zoshchenko and Bulgakov, are discussed as well.

275A Dostoevsky and the Russian Idea, Lect. and discussion 2 hrs.; no prerequisites. 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 great Russian philosophers, like V. Solovyev and N. Berdyaev.

276B Dostoevsky and Western Literature, Lect. and discussion 2 hrs.; no prerequisites. 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 some Western thinkers, like Nietzsche and Freud.

300 Advanced Russian, Lect. 3 hrs. *Prerequisite:* Russian 200 or equivalent. Conducted in Russian.

Following a thorough review this class concentrates on expanding all aspects of the students' knowledge of Russian. Grammatical topics treated include systematization of the verb, aspect and voice, word formation, punctuation, and elements of stylistics. Soviet and emigre texts are read extensively and intensively. Discussions and compositions are based on the assigned readings and on conversational materials drawn from Soviet universities.

302 Russian Prose and Poetry, Lect. 3 hrs. *Prerequisite:* Russian 200 or equivalent. Conducted primarily in Russian.

Students read, translate, and critically interpret a series of the best short stories of such great Russian authors as Pushkin, Tolstoy, and Chekhov, and poems by Lermontov, Mayakovsky, Mandelstam and Pasternak. Original texts are supplied with vocabularies and grammatical notes. Texts are chosen according to the level of students' knowledge.

309A Soviet Society Today, N.G.O. Pereira.

(See History 3090A.)

301B Grammar

(See listing under Russian Studies Programme.)

303B Conversation

(See listing under Russian Studies Programme.)

305A Vocabulary Building

(See listing under Russian Studies Programme.)

308B Phonetics

(See listing under Russian Studies Programme.)

310A Intensive Russian Grammar

(See listing under Russian Studies Programme.)

312A Intensive Russian Prose and Poetry

(See listing under Russian Studies Programme.)

325A/B Literature of Revolution: The 1920's in Russian Literature, Lect. and discussion 2 hrs.; no prerequisites. 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, of culture, in the new collective society. Close reading and discussion of texts by Pasternak, Babel, Zamyatin, Olesha, Pilnyak, Zoshchenko, and Bulgakov.

327A/B The Russian "Heroine", Lect. and discussion 2 hrs.; no prerequisites. Conducted in English.

The strong spiritual and moral force which Russian women have exerted on their society is richly reflected in literature. The class focusses on the portrayal of several literary heroines and discusses their impact on both the literary imagination and society. Their number includes Pushkin's Tatyana, Dostoevsky's Sonya Marmeladova and Nastasya Filippovna, Tolstoy's Anna Karenina, Gorky's *Mother* and Bulgakov's Margarita.

333A/B The Russian Short Story, Lect. and discussion 2 hrs.; no prerequisites. Conducted in English.

On the basis of ten to twelve Russian masterpieces in the short story genre, students have a chance to trace the development in this field from Pushkin and Gogol, throughout Turgenev, Tolstoy, Dostoevsky to the best short stories of post-revolutionary writers, including I. Babel, M. Zoshchenko, B. Pilnyak, A. Platonov.

350A/B Gogol and his Tradition, Lect. 2 hrs.; No prerequisites.

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 and his impact on the work of Dostoevsky, Kafka, Bely and Bulgakov.

400 The Structure of Contemporary Standard Russian, Lect. and discussion. *Prerequisite:* Russian 300 or permission of the instructor. Conducted in Russian.

Systematic study of the structure of Russian: analysis of special problems in phonology, morphology, syntax, and stylistics. Tailored to the individual needs of the student, with emphasis on practical applications of linguistic insights.

430 Russian Poetry, Lect. and discussion. *Prerequisite:* Permission of the instructor. 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.

480A Old Church Slavonic, Lect. 2 hrs.; *Prerequisite:* Russian 300.

A survey of Old Church Slavonic grammar accompanied by intensive study of its canonical texts.

482B Historical Phonology and Morphology of Russian, Lect. 2 hrs.; *Prerequisite:* 480A.

An outline of the evolution of the sound pattern and grammatical structure of Russian from their roots in Common Slavic to the present. Representative readings from Old and Middle Russian texts.

497, 498, 499 Russian Special Topics, Staff. *Prerequisite:* Permission of the Department. Conducted in Russian.

Offers the student an opportunity to work with an advisor in researching subjects which are not regularly taught in the Department. Students who wish to register for a specific programme should consult the chairman of the Department.

Russian Studies Programme

Participating Faculty:
Yuri Glazov (Professor of Russian)
Norman Pereira (Associate Professor of History)
Ieva Vitins (Assistant Professor of Russian; Coordinator of the Programme)
John A. Barnstead (Assistant Professor of Russian, Coordinator of the Programme)

The Russian Studies Programme, the only one of its kind in Canada, is a special inter-disciplinary course of instruction which allows Dalhousie students (as well as students from other Canadian universities) to undertake intensive study of the Russian language, both here and in the Soviet Union. In order to participate, students must be able to demonstrate competence in the Russian language equivalent to two years of university classes (at Dalhousie these are Russian 100 and Russian 200) with a mark of "B" or better. The duration of the programme is one academic year, the first half of which is at Dalhousie or some other Canadian university, the

second half of which is at the Pushkin Institute in Moscow, or at Leningrad State University. Enquiries and applications should be addressed to the Coordinator of the Programme.

Classes at Dalhousie, September to December

309A Soviety Society Today, N.G.O. Pereira. Conducted in Russian.

See History 3090A.

310A Intensive Russian Grammar, Lect. 10 hrs.; Soviet language specialist. Conducted in evoted Russian.

Approximately one-half of class time is devoted to grammar and reading. The remaining time is dto conversation and pronunciation. The class meets for five two-hour sessions each week. There is one written composition per week of 2-3 pages. The instructor works closely with individual students. This is a six-credit-hour course.

312A Russian Prose and Poetry, Lect. and discussion 5 hrs. Conducted in Russian.

The students read, translate and critically interpret a number of the best short stories of such great Russian authors as Pushkin, Tolstoy, and Chekhov, and poems by Lermontov, Mayakovsky, Mandelstam, and Pasternak. Original texts are supplied with vocabularies and grammatical notes. This is a six-credit-hour course.

315A Russian Society, Literature and Arts, Lecture and discussion 2 hrs.; Staff. Conducted in Russian.

The course, read in Russian by various faculty members, aims to provide students with necessary knowledge of Russian literature, history, fine arts, religious and philosophical ideas.

Classes at the Pushkin Institute, Moscow, January to May

301B Grammar

Intensive study of the finer points of Russian grammar. Topics include verbs of motion, aspect, impersonal constructions, government and agreement, and other themes. Six credit hours.

303B Conversation

Systematic development of conversational ability on everyday themes: transport, city services, theatre, sport, shopping, the library, the Soviet educational system, the structure of the Soviet government, etc. Three credit hours.

305B Vocabulary Building

Extensive and systematic study of the Russian lexicon: differentiation of synonyms; stylistic differences. Three credit hours.

308B Phonetics

Comprehensive study of Russian pronunciation: language laboratory training and techniques of correcting pronunciation. Three credit hours.

Sociology and Social Anthropology

Chairperson of Department
Victor Thiessen

Professors
J.H. Barkow, A.B. (Brooklyn), A.M., Ph.D. (Chi.)
D.H. Clairmont, B.A., M.A. (McM.), Ph.D. (Wash. U.)
R.C. Kaill, B.A. (Dal.), B.D., M.A. (Tor.), Ph.D. (McG.)
L. Kasdan, M.A., Ph.D. (Chic.)
J.J. Mangalam, Ph.D. (Corn.)
W.N. Stephens, A.B. (Colo.), M.A. (Bost.), Ed.D. (Harv.)

Associate Professors
P.M. Butler, B.A., M.A., Ph.D. (Univ. of Tor.)
D.H. Elliott, B.A. (Yale), Ph.D. (Pitt.)
J.L. Elliott, B.A. (Wells), M.A. (Kan.), Ph.D. (Pitt.)
H.V. Gamberg, B.A. (Brandeis), A.M., Ph.D. (Princ.)
V.P. Miller, B.A. (U. California at Berkeley), M.A., Ph.D. (U. California at Davis)
J.G. Morgan, B.A. (Nott.), M.A. (McM.), D.Phil. (Oxon.)
J. Stolzman, B.A. (Ore.), M.S. (Fla.), Ph.D. (Ore.)
V. Thiessen, B.A. (Man.), M.A., Ph.D. (Wis.)

Assistant Professors
R. Apostle, B.A. (Simon Fraser Univ.), M.A., Ph.D. (U. California at Berkeley)
M.E. Binkley, B.A., M.A., Ph.D. (Univ. of Tor.)
P.G. Clark, B.A., M.A. (McM.), Ph.D. (U.B.C.)
N.W. Jabbra, B.A. (U. California at Santa Barbara), M.A. (Ind.), Ph.D. (Catholic)

Honourary Assistant Professors
B. Devine, B.Sc.N. (M.S.V.U.), M.A. (Dal.), R.N.

Visiting Professor
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Sociology and Social Anthropology

This Department offers courses and programmes of study in the related disciplines of sociology and social anthropology.

Sociology

As a social science, sociology seeks to apply the scientific method to human behaviour. In doing so, it makes two assumptions - that human social life exhibits regularity and recurrent patterns, and that people are essentially social animals. The sociological enterprise focusses upon social relationships, social institutions and processes of social change. No single approach to these complex phenomena has been found adequate. As a result, a wide range of explanatory models and perspectives has evolved.

Sociology provides a context within which students learn to think critically about their social environment; become aware of the impact of social forces on their lives and the lives of others; and develop skills of analysis useful in understanding and management of their social environment. Many students find a sociology major helpful in preparing for social work, nursing, personnel management and other occupations dealing directly with people.

Social Anthropology

Anthropology is a diverse discipline whose branches study the human species in all of its physical, cultural and linguistic diversity in both space and time. It consists of four sub-disciplines: Archaeology, Linguistics, Physical Anthropology, and Social or Cultural Anthropology. As a joint department of Sociology and Social Anthropology this department is committed to a programme which stresses the areas of convergence between the two disciplines. The major focus therefore is upon courses in Social Anthropology, although courses in other areas may be offered.

Social Anthropology shares many theoretical and substantive interests with Sociology. It adds a strongly comparative dimension by its concerns with the complete range of human societies and cultures in all historical and geographic settings. Its primary emphasis is upon preindustrial societies and the non-industrial sectors of more complex societies. Its concern is with all levels of social and cultural integration from the family, through the band, the chiefdom, and the state. It aims at generalization by comparing structures and processes in major institutions within societies (kinship, political, economic, and religious), as well as between societies. A well-trained social anthropologist will be acquainted with overlapping areas in Sociology, just as a well-trained sociologist will be acquainted with Social Anthropology.

Career Options

Career possibilities in sociology and social anthropology include research and managerial positions in government, industry, or university, and teaching at the high school or university levels.

Degree Programmes and Course Offerings

Degree Programmes

The department offers a major in Sociology and Social Anthropology leading to the general B.A. degree. It offers honours B.A. degrees in Sociology, in Anthropology, and in Sociology/Social Anthropology.

B.A. Degree
Students enrolled in the bachelor's (i.e. three-year) degree programme must take at least four and no more than eight classes beyond the introductory level in their areas of concentration. Required classes for students majoring in Sociology and Social Anthropology include:

One of SSA 1000, 1100, or 1200; either 2010A/B or 3410; and either 2240A/B or 2250B. In addition, at least one class (either 2 half-courses or a full-year course) must be a third year seminar. All students, (whether Sociology and Social Anthropology majors or not) must have either SSA 1000, 1100, or 1200 as a prerequisite for any classes on the 2000 or higher levels, or obtain permission from each instructor involved. Any one of the three introductory classes is an acceptable prerequisite for any of the department's offerings. However, no student may take more than one introductory level class in Sociology and Social Anthropology.

Recommended Course Structure

Year I
1. SSA 1000, 1100 or 1200.
2. At least one introductory class in Economics, Political Science, Psychology, History or Biology.
3-5. Three other classes chosen from fields other than Sociology and Social Anthropology.

Year II
6. SSA 2010A or B or 3410 and 2240A or B or 2250B.
7-8. Two other classes in Sociology and Social Anthropology.
9-10. Two electives.

Year III
11. At least one third year seminar in Sociology and Social Anthropology.
12-13. Two other classes in Sociology and Social Anthropology.
14-15. Two electives.

Honours B.A. Programme
Students may choose from three honours programmes: Anthropology, Sociology, and Comparative Sociology/Social Anthropology. An honours degree is a recommended and frequently required preparation for advanced study in both Sociology and Social Anthropology. These programmes normally consist of not less than nine nor more than eleven classes in Sociology and Social Anthropology beyond the introductory level. Each programme consists of 4 and 1/2 required classes and an honours thesis.

Required Core Classes

A. Anthropology Programme

2250B Introduction to Social Anthropological Theory
2370 or 2380 Peoples and Cultures of the World
or both
2350A Native Peoples of Canada
and
2360B Native Peoples of the United States
3410 Social Statistics
4000 Seminar in Social Anthropology
4590 Honours Seminar in Social Anthropology

B. Sociology Programme

2240A or 2240B Introduction to Sociological Theory
3100 Research Methods
3401A History of Sociological Thought
3405B Contemporary Sociological Theory
3410 Social Statistics
4500 Honours Seminar in Sociology

C. Comparative Sociology/Social Anthropology Programme

2240A or 2240B Introduction to Sociological Theory OR
2250B Introduction to Social Anthropological Theory
2020 Comparative Sociology/Social Anthropology
2010A or 2010B Social Research
3410 Social Statistics
3405B Contemporary Sociological Theory OR
4000 Seminar in Social Anthropology
4500 or 4590 Honours Seminar

The Seminar paper produced in 4500 or 4590 is examined as an honours thesis. This fulfills the university requirement that a comprehensive examination covering a student's honours work be passed in order to receive an honours degree. Interested students should contact the chairman of the department's Undergraduate Education Committee, Professor N.W. Jabbra. The Committee chairman and the student select an honours adviser. Normally the adviser is a faculty member teaching in the student's subfields of concentration.

Combined and Unconcentrated Honours
Combined honours programmes can be arranged between sociology and social anthropology, and economics, history, philosophy, political science, and psychology. Combined honours involving other disciplines than those listed may be arranged, if the departments concerned agree. Students wishing to arrange combined or unconcentrated honours programmes are advised to seek the counsel of the departments involved as early as possible.

Canadian Studies Programme
The Department is cooperating with several other departments in offering a Canadian Studies Programme. Interested students should contact Professor P. Clark.

African Studies Programme
The Department is cooperating with several other departments in the African Studies Programme. Interested students should contact Professor J. Barkow.

Sociology and Social Anthropology Classes Offered

1000 Culture and Society

An introduction to the comparative study of human society from the parallel perspectives of Sociology and Social Anthropology. The principal focus is on continuity and change in a variety of societies ranging from simple hunting and gathering societies to highly complex industrial societies.

1100 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.

1200 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 course contents include the study of culture, socialization, deviance, social organizations, institutions, social roles and demography. Emphasis is on the study of modern industrial societies with special attention given to Canadian society.

SSA 1000, 1100, or 1200 are all acceptable as a prerequisite for all upper level classes.

2000 Archaeology: An introduction

This class covers the following topics: archaeology and its relationship to history and prehistory; the origins and growth of the discipline of archaeology; the application of archaeological techniques in the field of prehistory; the excavation of a site; the establishment of a chronological framework; the reconstruction of the historical past.

2010A & B Social Research

Acquaints students with the skills used by sociologists to analyze social phenomena. A variety of quantitative and qualitative methods are introduced which enable the student to understand and evaluate fact-finding and problem-solving studies of social phenomena which are routinely carried out by sociologists, and by practitioners in such fields as business, government, social work, health, and education. The class begins with a consideration of the selection and formulation of the research problem and includes discussion of the techniques of data preparation and analysis.

2020 Comparative Sociology/Social Anthropology

The starting point is the vision of the founding fathers of sociology that the discipline was to be a comprehensive and comparative science of society. Modern sociologists view comparative studies primarily in large scale cross-societal terms, while modern social anthropologists (equally the intellectual descendants of the founding fathers) tend to be more interested, in addition to a comparative approach, in the natural history of smaller societies, and in applying the methods learned in these to more complex societies. The first part is devoted to a treatment of several topics from the social anthropological perspective. The second part treats the major figures and ideas in social anthropology and general sociology from an historical perspective. Student field projects are an important part of the learning process in addition to the more usual kinds of assignments.

2030 Deviance and Social Control

Groups make formal and informal rules in an attempt to regulate and make predictable the behaviour of their members. Violations of these rules occur in many different ways and stem from various causes. This class examines both the processes by which groups make rules and the reasons why these rules are violated. Specific issues such as crime, delinquency, narcotic addiction, alcoholism, prostitution, suicide, and minority group relations are discussed in this context.

2040 Social Stratification

Aspects of social inequality in modern, industrial society. The formation of classes, status groups and the organized political expressions are considered. Questions of the distribution of power and wealth in society, the existence of power elites or governing classes, the impact of bureaucracy on class relations, the extent to which major economic inequalities have been reduced in this century, problems of the mobility of individuals and the groups through the stratification system and the impact on social structure are dealt with. Theoretical discussions in the class are largely concerned with the ideas of Karl Marx and Max Weber, but attention is also paid to contemporary theoretical approaches to stratification.

2050 Sociology of Religion

The relations between religious beliefs and human behaviour and social structure. Major themes include: the impact of social structure on the development of belief systems; the question of whether beliefs guide and direct human behaviour; the formal organization of the religious institution, social psychological considerations of religious behaviour. The primary focus is on current religious movements in Canada.

2060 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.

2070 Socialization

Socialization is the process by which a society's values and customs are perpetuated, passed along to the younger generation. This is seen as the function of certain institutions, such as the family, the churches, and the schools. These, however, require support from the larger social milieu. Our own rapidly changing society appears to be at a point of crisis in this regard. Recent social changes have undermined traditional means by which children acquire a sense of allegiance to their elders, and take to themselves the society's major values. This change is described, along with the situation of modern parents, who must train their children in the absence of certain traditional supports. This class is designed primarily for parents, for people who are working with children and youth in such fields as teaching, recreation, the social services, and medical fields, and for persons who otherwise have experience in child-care. Problems in training children for responsibility, in a modern-urban milieu, are dealt with in some detail.

2080 Communities

An examination of a wide variety of territorially based residential groups such as the large metropolitan centre, the rural village and the intentional community. Major themes include: evolution of the modern city, urbanization, rural depopulation, ecology of the city, neighbourhood social networks, behaviour in public places, minority subcommunities and urban planning.

2090 Youth Organizations

Based on a comprehensive survey of those organized activities for teenagers in North America which attempt to give substantial socialization experiences to the youth who participate. Organizations which offer leadership training, high school clubs and extra-curricular activities, youth programmes by the churches, programmes of volunteer work and paid employment, junior auxiliaries of political parties and military reserve units, hobby groups, cities' recreation departments, sports programmes, summer camps and travel programmes, wilderness and environmentalist groups are reviewed, along with such organizations as the Y, the Scouts, 4-H, and Junior Achievement. Cities' information offices, voluntary action centres, learning exchanges, and other systems for disseminating information about youth programmes are also reviewed. Certain towns and cities are compared with respect to their offerings for teenagers. Persons who have had experience in youth work, or as teachers or parents, are especially invited to enroll.

2100 Ecology and Culture

This class deals with the way in which different environments affect how people live, relate to one another, think and organize themselves. The major focus is on how cultural choices are influenced and constrained by the relationship among ecology, technology, and how people are making a living. Examples of hunter-gatherer, horticulturalist, rancher and farmer cultures are used as illustrations. Classes are a combination of lecture and seminar sessions.

2110 Canadian Society

An analysis of selected aspects of Canadian society employing theoretical perspectives and empirical materials, to develop a composite view of the society as a whole through understanding the interrelationships between its parts. Major foci include the integration and survival of Canadian society, structural change, and the management and consequences of inequality. Prospects for the future of Canada are discussed in terms of these characteristics.

2120 Minority Groups

The social status of minority groups is examined in the light of contemporary theories of prejudice and discrimination. The societal consequences of discrimination are considered with respect to their effect on both minority and majority groups. Emphasis is on an analysis of Canadian minorities.

2130 Formal Organizations

This class makes a critical study, from the comparative point of view, of theoretical models for the analysis of bureaucratic organizations. Students examine the classical, structural-functionalist, and management-science approaches to organizations. The class entails a systematic survey of the sociological literature on this subject, with special concentration on organizational structure, strategy and decision-making.

2140 Industrial Sociology

The social relations of industry at both the micro- and macrosociological levels of analysis. The class deals primarily with the productive system and attendant industrial institutions of advanced capitalist society. Major topics for investigation include the industrialization process, the social structure of industry, the development of trade unionism, and the sociology of work relationships.

2150 Mass Society

The origin of modern, post-industrial "mass society". Problems associated with industrialization, cybernation, leisure, technology, and environmental degradation are examined in detail. Various attempts at solution of these problems are analyzed. The rise of the "expert" and of counter-cultural movements are given particular attention. Theoretical and methodological innovations for "future forecasting" are introduced.

2160 Sociology of Occupations

Sociological views of the occupational structure, and of the constraints and influences that bear upon persons in various occupations. During one half of the class, students are helped with personal career plans.

2170A Political Sociology

Introduces students to the major concepts and theories which inform the sociological study of politics. In addition to this general orientation particular attention is devoted to the role of power and ideology in Western society, the interplay between economy and polity in contemporary North America, and political transformation as a social process.

2190 Sex Roles in Cross-Cultural Perspective

Taking a broad comparative framework, we examine sex roles in the contexts of daily life, of economics, politics, kinship, social stratification, religion and values, and socialization. With these data as background, we then look at sex roles in Canada and in Nova Scotia. Students of either sex are invited to take this class.

2200 Sociology of the Family

Family in one form or another is an aspect of all societies. It is the most important agent of early socialization and personality formation. The first part is devoted to a consideration of some of the cross-societal characteristics of family in general, and of the extended family as found in traditional societies, in particular. The second term is devoted to a consideration of family characteristics in urban-industrial societies, concentrating on nuclear family with particular reference to the Canadian scene. An attempt is made to understand the processes by which family's structures and functions have changed through time as societies evolved from a traditional to an urban-industrial social organization.

2220 Social Psychology

Groups influence individuals and individuals react (resist, adapt to, cooperate with, or use to their own advantage) to these influences. The processes involved in such person-group relationships are explored in a number of different settings, such as the family, mental hospitals, and universities. The class will focus on both a critical review of the actual studies done and on social-psychological interpretations or "theories" of these findings.

2230 Psychological Anthropology, *Prerequisite:* Either SSA 1000, 1100, or 1200, or Psychology 100.

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. A paper is required.

2240 A & B Introduction to Sociological Theory

An introduction to some of the major approaches taken by sociologists to understand the nature of society. The early foundations of social thought are surveyed with emphasis on the emergence of sociology as a 'science' in the nineteenth century. The contributions of prominent theorists: Durkheim, Marx, Mead, Spencer and Weber are stressed. The most important sources of virtually all the varieties of sociological theories of the twentieth century are found in these thinkers. Specific contemporary approaches to be considered include functionalism, conflict theory, social action theory (including symbolic interactionism and ethnomethodology) and exchange theories.

2250B Introduction to Social Anthropological Theory

The foundations and development of social anthropology. The growth of theory in social anthropology is stressed, with special attention paid major schools of thought and the work of prominent individuals within those schools, including Cultural Evolution and Morgan; American School and Boas; Functionalism and Malinowski and Radcliffe-Brown; Culture and Personality; Ethnoscience; and the directions in which contemporary social anthropology points. Special efforts are made to expose students to the original writings of prominent anthropologists.

2260 Culture and Political Behaviour

Political systems examined comparatively. Relation between political and other social institutions and analysis of the organization of conflict in non-Western societies. The relation of tribal and peasant politics to national politics in developing countries seen in a comparative framework.

2270 Language and Culture

An introduction to aspects of linguistics which relate to anthropology. The history of anthropological linguistics is reviewed, with attention to North American workers in the field, including Boas, Sapir, and Kroeber. Current areas of study in anthropological linguistics are examined. The relation of language to culture is considered, drawing on examples from primitive and complex societies. Students also learn to record sounds phonetically, and to analyze the sounds and words of a language into meaningful units for the speakers of that language.

2290A Belief Systems

The study of non-Western belief systems. Emphasis is on the religion of small-scale societies, treated form the perspective of religion as a system of symbols giving meaning to the universe and one's place in it. Topics include religion as a biological phenomena, the nature of ritual, religion and healing, religion and altered states of consciousness, sorcery and witchcraft, religion and culture change.

2310 Ethnohistory of North American Indians

The history of Indian-White relations in North America, including the United States and Canada, from the time of the Indians' first contact with Europeans and Asians to the present. Emphasis is on presenting this history from the natives' point of view.

2350A Native Peoples of Canada

A general introduction to native cultures of Canada. Following a review of prehistory, it first considers the geographic "culture areas" in Canada and representative tribes in them, then considers Canadian native ethnohistory, and concludes with a consideration of contemporary native peoples.

2360B Native Peoples of the United States

A general introduction to native cultures in the United States. Following a review of prehistory, it considers the geographic "culture areas" in the United States and representative tribes in them, then considers United States native ethnohistory, and concludes with a consideration of contemporary native peoples.

2370 Peoples and Cultures of the World I

Each year, the Peoples class surveys the peoples of a specific geographic area. The class includes background material on geography, climate, and history. Its focus is on the people themselves, their social organizations and political, economic and kinship systems and their problems of modernization and development. Consult the department to find which regions are to be offered in the near future.

2380 Peoples and Cultures of the World II

See class description above.

2400 Medicine and Health Across Cultures,

Every culture has its own concepts of health and nutrition, its own treatments and practices. The strengths and weaknesses of our own system grow clearer when medical anthropologists compare it with that of other societies. This class's specific topics vary from year to year but always include: native theories of the etiology of illness; transcultural vs. culture-specific disease syndromes; pregnancy and childbirth in other cultures and our own; senescence and death viewed cross-culturally; the conflict between traditional medical systems and the Western physician and hospital; patients' expectations and the medical subculture; the physician as secular priest; and food and nutrition across cultures. Special attention is paid to Canada's native and immigrant peoples.

3010A/5010A Sociology of Work Roles

Examination of structure and dynamics of management'employee relationships from sociological perspective. There will also be consideration of horizonal relationships among workers at various status levels. Organizations to be studied include both small and large-scale work structures. Consideration of the implications of collective bargaining procedures on work roles is also included.

3020B/5020B Comparative Economic Organizations

Critical examination of the nature of economic organizations. Emphasis is on how economic activities are organized in various cultures, from primitive to modern, with particular focus on development trends. Consideration is also given to alternative and futuristic models.

3030 Social Problems and Social Policy

This seminar focusses on the policy implication of research into various social problems. It addresses the issue of moving from delineation of a social problem, to doing the necessary research, to the development of policy relevant to the problem and considers issues in problems of implementation of policy.

3060B Modernization and Development

Change, modernization, and development as distinct but related notions. Beyond examining the meanings and implications of these terms, an attempt is made to outline some of the complex processes involved in planning for national development of traditional societies. For purposes of concrete illustrations, the class will focus on the problems of South Asia, and appropriate areas of Canada.

3070 Human Nature and Anthropology, *Prerequisite:* An introductory class in sociology or anthropology, or in psychology or biology.

Can anthropologists explain why we feel sexual jealousy or why we tend to follow a dominant leader in times of stress? Can the evolutionary theories explaining why we have fingerprints and flat nails explain our behavioural traits? This class reviews the fossil record of human evolution and recent developments in the theories which deal with it, in order to examine critically biological explanations of human sex differences, culture, infant behaviour, racial prejudice, altruism, aggression, and other topics.

3090 Population and Society

An analysis of the interrelationships of population and social structure. The class examines changes in size, structure, and distribution of world population in terms of the three major demographic factors: fertility, mortality, and migration, with emphasis on their social, economic, and political causes and consequences.

3100 Research Methods

A detailed survey of the basic methods of social research. The topics discussed include the construction of theory, the formulation of research problems, research designs, measurement, methods of data collection, and analytic theory testing. Special attention is given to the sample survey as one of the main methods of social science research. Practical experience in survey methods is proved through a class project.

3120 Social Conflict

Introduces students to the various analytical perspectives sociologists have employed to understand the patterning and consequences of conflict in society. In this regard particular attention is devoted to the functional, coercion, and 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.

3130 Sociology of Health and Illness

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.

3140 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 mental patient and the development of mental health policy in Canada. The class adopts a seminar format and evaluation is based primarily on essays or a term paper.

3150 Sociology of Education

The nature of human learning within its cultural context. Analysis of social learning mechanisms and processes receives major consideration.

3160 Dawn of Civilization

The first civilizations came into being in Mesopotamia, Egypt, the Indus Valley and China in the Old World. We examine the problem of the origin of these civilizations in the light of the latest archeological research. Did they all develop from one centre and the process of civilization take place once, and once only, in human history, or did it occur independently in different parts of the world? This class involves extensive use of slide materials.

3170 Sociology of Sport and Recreation, (Same as Phys. Ed. 4490A).

A survey class which views the interrelationships among sport, culture, and society from a vides a broad sociological perspective. The class prooverview of selected sociocultural factors which help to explain the incidence, form and regulation of sport and specified recreational elements in contemporary society.

3180B Issues in the Study of Society

This seminar consists of an intensive examination of a selected substantive issue within Sociology and Anthropology. Since the specific topic or research problem which receives special treatment will differ from year to year, students are advised to consult the department prior to registration.

3190 Social Movements

The general topics 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, like 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.

3200B Comparative Social Organization

The ways in which human beings organize themselves in common purpose. Examples of such ways include kinship structures, voluntary associations, role structures, class and caste stsyems, and networks. We emphasize pre-industrial societies and non-industrial sectors of industrial societies, placing them in a comparative framework.

3210 Peasant Society and Culture

A comparative examination of the way of life of the majority of mankind. Problems of defining salient characteristics which distinguish peasant from other types of societies are dealt with. Various models for describing and analyzing the behaviour of peasants are examined. Their applicability to traditional Canadian fishing communities, and to French Canada, are examined. The role of peasants in modern social change is a major focus.

3220B/5220B Coastal Communities (Same as ES 5180B)

Coastal Communities as a social/ecological type are examined as populations, social structures (territorial, economic, occupational, political) as they have developed in response to particular ecological and social circumstances. Various perspectives which have been applied to coastal communities are examined with regard to the contribution they may make to understanding the dynamics of these communities. Major (though not exclusive) emphasis is on North Atlantic communities.

3240 Criminology

Crime as a form of social deviance. The significance of official crime rates is analyzed, and the various forms of criminal structure and behaviour are examined. The second part of the class deals primarily with societal response to offenders, tracing the judicial and correctional processes in Canada.

3250 Sociology of Science and Ideas

In the attempt to understand the reciprocal interaction between science and society we stress a comparative approach, examining science in different cultural groups and different historical periods. Various modern scientific disciplines are compared in different countries, including developing and developed countries, with differing economic and political organizations. The social organization of science is investigated through the application of micro-sociological analysis (e.g. small groups and organizational sociology theory). In particular, we focus upon tensions and conflicts within the scientific community which are understandable in sociological terms. We examine innovation and change within the scientific community, including the processes by which new fields emerge and new ideas are evaluated.

3260A The Development of Sociology as a Discipline

The "Sociology of Sociology". Main concern is the manner in which sociology came to be a distinct field of enquiry in the late nineteenth century, and why it took the forms it did. Special attention is given to the divergent paths of Sociology in the United States, Great Britain, Germany, and France in order to analyze the relationship between the sociological enterprise and its social context. Prior classes in the history of sociological thought and in the sociology of knowledge are advantageous.

3270/5270 Sociology of Careers

Careers in the humanitarian, social service, working-with-people area receive especial emphasis, as do sociological studies of the unemployed. This is a seminar for graduate students and advanced undergraduates, with individualized research projects.

3280 Juvenile Delinquency

Juvenile delinquency as a form of social deviance. Current issues in delinquency are defined and analyzed from a sociological perspective. The class focusses on etiologies of delinquency, the juvenile justice system and sentencing alternatives.

3290 Penology and Corrections, *Prerequisite:* SSA 2030 or 3240 or 3280 or permission of the instructor.

This class traces the difficulties of the penal system in Western societies, with particular reference to Canadian corrections. The effectiveness of current methods is assessed in terms of their aims and objectives. Problems of the evaluation of current practice receive major consideration.

3300 Cross-Cultural Study of Socialization, *Prerequisite:* Sociology and Social Anthropology or permission of the instructor.

In this class the student (1) is introduced to the cross-cultural research method, and (2) becomes expert on the ethnographic literature on one of the world's major culture areas as it treats a problem. The student writes at least one major paper, and participates in one or more (probably two) cross-cultural investigations.

3310 Time and Society

The organization and utilization of time in human societies. We examine several attempts by social scientists to develop theories (and perhaps revise them) through the empirical examination of patterns and correlates of time use in different societies and cultures. We study both preliterate and developed societies and utilize both "anthropological" (e.g. ethnographies) and "sociological" data (e.g. surveys). The class is conducted as a seminar with discussion of assigned readings and class reports dealing with ancillary readings. Students must participate regularly in the seminar and make oral presentations of their research papers. One or two short research papers are required in the first half year, with a major paper being due in the spring. Topics for these papers are developed in consultation with the instructor. The final class grade is based on the following criteria: Seminar presentations and discussion (25%), short paper(s) 25%, and a major paper (50%).

3401A A History of Sociological Thought

Selected theorists in the history of sociological thought. Students make one oral presentation and present a written report at the end of the term.

3405B Contemporary Sociological Theory

A number of recent theoretical developments in sociology are critically examined. The choice of specific theoretical topics is left up to the instructor.

3410 Social Statistics

The logic behind a statistical approach to the solving of problems is emphasized in this class. A step-by-step unfolding of statistical reasoning is presented in the lectures. Students then apply these steps to an analysis of some sociological data. The resulting analysis is written in several drafts of the same paper. An appreciation of the interplay between methods, theory, and statistics is emphasized. A grasp of Grade 9 algebra is assumed.

4000 Seminar in Social Anthropology

Offered sporadically, this seminar is designed to allow small groups of students to pursue a particular area in social anthropology for which no regular course is offered. The topic and requirements for the class are jointly decided by the students and the professor involved.

4500 Honours Seminar in Sociology

Oral presentation on selected theoretical and research topics is made in seminar and finally completed as written papers. Topics are selected to fit the specific needs of individual student's honours programmes.

4590 Honours Seminar in Anthropology

This class carries two credits. The student writes an honours thesis under the supervision of his principal adviser.

4510A Readings in Sociology

4520B Readings in Sociology, *Prerequisite:* Written permission of instructor.

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.

Spanish

Chairperson of the Department
S.F. Jones

Professors
S.F. Jones, B.A. (Benn.), M.A. (Calif.-Berkeley), Ph.D. (Harv.)
A. Ruiz Salvador, B.A. (Brandeis), A.M., Ph.D. (Harv.)

Associate Professor
J.E. Holloway, B.A. (Colo.), M.A. (Wyoming), Ph.D. (Duke)

Assistant Professor
J.M. Kirk, B.A. (Sheff.), M.A. (Queen's), Ph.D. (U.B.C.)

After Chinese and English, Spanish is the most widely spoken language in the world. It is the native tongue of well over 300 million people living in 22 countries.

Spanish-speaking nations are making international headlines and students of political science, economics, commerce, sociology-anthropology, literature, history, and other academic disciplines feel increasingly interested in this area of the world. Students from these departments are welcome to take our classes on Spanish and Latin American culture, civilization, history, and politics. These classes are conducted in English, the reading is in translation, and there are no prerequisites.

Knowledge of the Spanish language will be useful to all Canadians seeking careers as members of the foreign service, businessmen, interpreters, translators, teachers, professors, critics, editors, journalists, and many others. Our beginning language course 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 course, 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 Administrative Studies, for example, could lead to a variety of possible careers in the Spanish-speaking world in international business and public service.

The Salamanca Programme at the Colegio de Espana
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 courses in Hispanic culture. In order to participate, students must normally have completed Spanish 201B 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 Espana in Salamanca, Spain. Dalhousie University will grant 2-1/2 credits to those students who successfully complete their courses in Spain. Enquiries and applications should be addressed to the Coordinator of the Programme.

Spanish Studies to be taken at the Colegio de Espana

Spanish	310 A	Advanced Grammar	(1 credit)
	312 A	Spanish Art	(1/2 credit)
	314 A	Spanish Literature	(1/2 credit)
	316 A	Spanish History	(1/2 credit)

Spanish Degree Programmes

Bachelor's Degree
Course should consist of at least four full-credit upper level classes taken in the second and third year, four of which must be conducted in Spanish. Any student who wishes to deviate from these basic requirements should consult the Department Chairman.

Bachelor of Arts with Honours in Spanish
Course should include:

Year I
1. Spanish 102.
2. Spanish 110, 111.
3-5. Electives.

Year II
6-8. Spanish 200, 201, 250, 251, plus two other 200 level classes.
9. Class in the minor subject.
10. Elective.

Year III
11-13. Spanish 302, 303, plus two other 300 level classes.
14. Class in the minor subject.
15. Elective in a subject other than 10.

Year IV
16-18. Three Spanish classes to be chosen from the upper-level programme.
19-20. Two electives (may be Spanish).

In addition, students are required to write an Honours essay, in Spanish, supervised by a member of the Department.

Bachelor of Arts with Combined Honours in Spanish and Another Subject. Programmes may be arranged by consultation (as early as possible) with the departments concerned.

Notes:
(1) the "other" classes chosen as electives in the programmes outlined above must satisfy general degree requirements.

(2) Combinations of classes other than those set forth above may be chosen after consultation with the Department Chairman.

(3) A student may, with the permission of the Department, be admitted to a Spanish course at an advanced point because of prior knowledge of the language. Such a student, however (except as he may be granted transfer credits in the usual way), must normally take the same total number of classes as other students in the same course.

Classes Offered

Classes marked * are not offered every year. Please consult the timetable on registration to determine if this class if offered.

102R Beginning Spanish, Staff. Discussion and conversation 6 hrs.; Language Lab. as needed. For students with no knowledge or only a slight knowledge of Spanish.

For students wishing to achieve proficiency in spoken and written Spanish. *Spanish One*, a textbook written and taught by members of the Department, avoids the usual chalk-and-blackboard dialogues often used in the classroom. Instead, it deals with the kinds of topics and controversial subjects that people in Spanish-speaking countries are likely to discuss: the pros and cons of going to university, the success and failure of marriage, the generation gap, women's lib, the population and pollution crises, and other items of human and social interest.

110B Spanish Culture and Civilization, Ruiz Salvador. Lecture and discussion 2 hrs. Conducted in English. No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

Although it may sound self-evident to Canadian students, this class deals with Spain and the Spaniards. What Spain is and who the Spaniards are, however, may not be that clear-cut for Spaniards themselves. This class is a search for Spain throughout her history (Roman, Arab, Jewish, and Christian Spain) with continuous reference to her art, literature, sciences, and customs. The goal is a clear picture of one of the most perplexing components of Western Civilization.

111A Latin American Civilization, Kirk. Lecture and discussion 2 hrs. Conducted in English. No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

The aim of this class is to provide the non-specialist with a basic understanding of this complex -and fascinating - world area. The first half of the class examines the development of Latin America from pre-Columbian times to the Mexican Revolution. In the second half, by means of a careful study of selected texts, the class examines the way in which the reality of Latin America has shaped a continental cultural identity, producing one of the most dynamic, "readable" world literatures.

200A Intermediate Spanish, Staff. Discussion and conversation 3 hrs.; Language Lab as needed.

This class continues the work done in *Spanish One*. Supplementary reading as necessary.

201B Reading and Conversation, Staff. Discussion and conversation 2 hrs.

Emphasis is on perfecting conversational skills as the reading material is discussed in class.

***207B Area Studies on Mexico and Central America,** Kirk. Conducted in English. No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

Following an examination of the Indian heritage, and the colonial legacy of the *conquistadores*, the class deals principally with the contemporary period, examining the Mexican Revolution and its aftermath, Petroleum Power, the Somoza dynasty, Nicaragua under the Sandinistas, the U.S. role in the region, the human rights situation in Central America, the current El Salvador crisis, and probable developments in the region. The class is designed to provide an understanding of the contemporary reality of this volatile region, in many ways a microcosm of the crucial situation of Latin America as a whole.

***208B The History of Modern Spain,** Ruiz Salvador. Lecture and discussion 2 hrs. Conducted in English. No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

A study of the major historical forces and ideas shaping the evolution of the modern Spanish nation from the reign of Charles III (1759) to the present.

***209A Women in Latin America,** Jones. Lecture and discussion 2 hrs. Conducted in English. No prerequisites. Open to students in all departments.

This class has four main objectives: 1) to examine critically assumptions about women held by the major academic disciplines; 2) to test these assumptions in the perspective of current research and individual experience; 3) to study traditional and changing sex roles in Latin America, with particular emphasis on Cuba; 4) to explore new alternatives for men and women in our society.

***211B The Cuban Cultural Revolution,** Kirk. Lecture and discussion 2 hrs. Conducted in English. No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

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 focusses on the problems and achievements of the Revolution, the peculiarities of Communism in a Caribbean society, and its effect on literature and the arts.

***212B The Spanish Inquisition and its Challengers,** Jones. Lecture and discussion 2 hrs. Conducted in English. No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

During the time of the Reformation, many Spanish thinkers came to believe that the Church had long since failed to interpret correctly and teach effectively Christ's message. The Church had become a powerful institution, and viewed the criticism as an attack on its authority. It responded by persecuting the dissenters and organizing a movement later known as the Counter Reformation. This class attempts to examine the process by which ideas eventually may become distorted when they are institutionalized, and the methods by which progress and change can come about in spite of the efforts of the establishment to repress dissension.

***213B Latin American Dictators: In the Novel,** Kirk. Lecture and discussion 2 hrs. Conducted in English. No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

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 phenomena with particular attention to the twentieth century, and attempts to discover its roots in militarism, underdevelopment, and imperialism.

***220B Literature of the Spanish Civil War,** Ruiz Salvador. Lecture and discussion 2 hrs. Conducted in English. No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

The Spanish Civil War, probably more than any other war in history, compelled the leading writers of the era to take a stand. As a rallying point for various ideologies - Communism, Anarchism, and Fascism - it clearly defined the issue of freedom versus tyranny. No war before or since has provoked so many words and so much action from so many writers.

***221A The Novel of the Mexican Revolution,** Kirk. Lecture and discussion 2 hrs. Conducted in English. No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

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.

***222B Masterpieces of Spanish Theatre,** Jones. Lecture and discussion 2 hrs. Conducted in English.

***223B Contemporary Latin American Prose,** Holloway. Lecture and discussion 2 hrs. Conducted in English. No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

This class samples short stories and novels of contemporary prosists from throughout Latin America. Included are works by such outstanding experimental writers as Julio Cortazar, Juan Rulfo, Carlo Fuentes, Alejo Carpentier, Garcia Marquez and Jose 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.

250A Introduction to Spanish Literature, Ruiz Salvador. Lecture and discussion 2 hrs. Conducted in Spanish.

Introduction to the main works and trends in Spanish literature. Study of illustrative works.

251B Introduction to Latin American Literature, Holloway. Lecture and discussion 2 hrs. Conducted in Spanish.

Introduction to the main works and trends in Latin American literature. Study of illustrative works.

302B Translation, Staff. Lecture and discussion 2 hrs.

Exercises in translation from Spanish to English and from English to Spanish.

303A Composition, Staff. Lecture and discussion 2 hrs.

Training towards accuracy in writing Spanish. Vocabulary building, free composition.

***307A Contemporary Latin American History,** Kirk. Lecture and discussion 2 hrs. Conducted in English. No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

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, Petroleum Power in Mexico, Chile under Allende and Pinochet, and the Sandinistas' Nicaragua. This helps the student understand the present-day reality of this important world area.

***320B Cervantes,** Jones. Lecture and discussion 2 hrs. Conducted in English. No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

This class examines Cervantes' philosophy of life through an analysis of his great masterpiece, *Don Quixote*. In this precursor of the modern novel, Cervanties studies human nature in all its many aspects. Life is presented as a complex and ironic interplay of idealism and disillusionment, appearance and reality, chivalrous love and worldly love. All truth is relative, but the ultimate irony is felt by the reader himself who discovers, in the end, that Don Quixote's view of the world is superior to that of all the "sensible" people who judged him to be mad.

***321B Borges,** Holloway. Lecture and discussion 2 hrs. Conducted in Spanish.

The Cervantine tradition of fiction dealing with a problematical reality persists in twentieth century Hispanic literature, and its most noted continuator is Jorge Luis Borges. Renowned for his fantastic, metaphysical short stories, Borges is one of the leading figures in contemporary world literature, and perhaps the greatest living writer in the Spanish language. This class serves as an introduction to his work and its relationship to the currents of contemporary literature and thought which inform it.

***322B Galdos,** Ruiz Salvador. Lecture and discussion 2 hrs. Conducted in Spanish.

A liberal thinker who studiously confronted the social conditions of his day and sought to counteract the prejudices of a formalistic, authoritarian society, Benito Perez Galdos (1843-1920) was Spain's foremost socio-psychological novelist, or, perhaps, literary social psychologist. Pre-eminent in his own country, Galdos must also be considered one of the most vital and representative novelists of the nineteenth century in Europe. This class focusses on *Fortunata and Jacinta*, his masterpiece.

***350A Contemporary Spanish Literature,** Ruiz Salvador. Lecture and discussion 2 hrs. Conducted in Spanish.
A study of representative works.

***351A Contemporary Spanish American Literature,** Holloway. Lecture and discussion 2 hrs. Conducted in Spanish.

A study of representative works.

398A Reading course for majors.

398B Reading course for majors.

***404A Advanced Style and Syntax,** Staff. Lecture and discussion 2 hrs.

***450A Golden Age Theatre,** Staff. Lecture and discussion 2 hrs.

***451B Golden Age Poetry and Prose,** Staff. Lecture and discussion 2 hrs.

498A Reading course for Honours students.

499B Reading course for Honours students.

Theatre

Chairperson of Department
P. Perina

Professor
A.R. Andrews, B.A., Dipl. Ed., M.A. (Leeds), Ph.D. (Ill.) F.R.S.A.

Associate Professors
R.G. Merritt, A.B. (Corn.), M.A. (N.Car.), Ph.D. (Tul.)
P. Perina, M.A., Dipl. Scenography (Prague)
David Overton, B.A., M.A. (U.B.C.), Ph.D. (Calif.)
P. Young, B.A. (Tor.)

Assistant Professors
R. Doyle

Lecturer
B. Zatzman, B.A., M.A. (Tor.)

Part-time Faculty
A. Murphy
P. Richards

Special Instructors
Katherine Andrews
Francine Boucher
Stacy Cameron (Light & Sound)
John Dunsworth
David Porter (Properties)
Ian Pygott (Technical Direction)
Ginette Rozon (Costumes)
Lynn Sorge (Costumes)
Ian Thomson (Construction)
Faith Ward
Mary McMurray

Theatre is a rich, complicated performing art that involves refined creative work in many different fields.

The Dalhousie Theatre Department offers different ways to study the theatre: (1) You can undertake programmes that lead to a university degree: an Honours B.A. (4 years), a General B.A. (3 years); (2) You can enroll in a training programme in costume studies that leads to: a Certificate (2 years), a Diploma (3 years); (3) You can select certain theatre classes to reinforce and complement your studies in other disciplines offered by the university; (4) You can enroll 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.

B.A. with Honours in Theatre (4 years)
Students who wish to follow a programme of theatre studies that keeps the whole of the theatre in perspective choose this programme. They must maintain a high scholastic level of performance to remain in this programme (B- or better in all classes.) Only theatre classes are listed.

Year 1: Theatre 1000, 1050.
Year 2: Theatre 2000, 2010, and choice of 2100A/B, 3100A/B, or 2700.
Year 3: Theatre 3000, 3500 and choice of 3400, 3600, or 4200.
Year 4: Theatre 4900 and choice of two of 4200, 4700, 4710.

B.A. with Combined Honours (4 years)
It is possible to follow a programme of studies that leads to Combined Honours in two subjects. Students interested in constructing such a programme should start by seeing both Chairmen of the disciplines they wish to combine. From that point a suitable programme can be constructed.

B.A. with Honours in Theatre (Acting) (4 years)
If accepted as a result of audition you pursue the following programme. In this calendar we just list the *theatre* classes (which over four years must amount to at least eleven, though you may choose to take thirteen).

Year 1: Theatre 1500
Theatre 1050
Plus three classes in other subjects
Year 2: Theatre 2010
Theatre 2800/2810
Plus two classes in other subjects
Year 3: Theatre 3800/3810 and 3500
Plus two classes in other subjects
Year 4: Theatre 4900 plus *two* of 4700, 4710, 4200
Plus two classes in other subjects

B.A. with Honours in Theatre (Scenography & Technical Scenography) (4 years)
People from very different backgrounds are attracted to the study of scenography. Students with considerable art school or architecture background are offered especially tailored programmes, and should contact the scenography professor to work out a suitable programme of studies in scenography. Students starting with a keen interest and little formal background in art or architecture are admitted if they meet the university entrance requirement, and should then plan to follow the following programme:

Year 1: Theatre 1000, 1050
Architecture 100
Plus two classes in other subjects
Year 2: Theatre 2010, 2700, 2060
Plus two classes in other subjects (2100A/B recommended option)
Year 3: Theatre 3060
Plus *three* of 2000, 2100A/B, 3100A/B, 3400, 3500, 3710, 4200
Plus one class in another subject
Year 4: Theatre 4900
Plus *two* of 3600, 4200, 4700, 4710
Plus two classes in other subjects.

Students wishing to pursue the scenography specialty are urged to make an appointment with the scenography professor before they register to ensure they plan their specific programme in line with their particular needs.

B.A. with a Major in Theatre (3 years)
You can take a 'major' in theatre in a three-year B.A. programme (15 classes). This requires at least four and not more than eight theatre classes beyond the 1000-level.

Year 1: Theatre 1000, 1050
Plus three other classes of your choice
Year 2: Theatre 2010
Plus up to *three* of 2000, 2100A/B, 3100A/B, 2700
Plus elective(s)
Year 3: Up to *four* of 3000, 3400, 3500, 3600, 4200
Plus elective(s)

Costume Studies, Certificate in 2 years, Diploma in 3 years
This professional programme is designed for the student whose goal is the professional theatre or the fashion industry. Admission is normally by meeting the university entrance requirement. Students in this programme do not have to take classes outside of theatre. Students are required to work on departmental productions as a means of gaining proficiency in garment assembly. In order to maintain a harmonious student/teacher relationship only twenty-five students will be enrolled in the first year, fifteen students in the second year and five in the third year. The third year prepares the student for professional work, either in the fashion industry or in the theatre.

Facilities
The department is located in the theatre wing of the Dalhousie Arts Centre. The theatre wing is a self-sufficient unit involving one proscenium theatre, two studios, and supporting workshops.

The department is developing close collaboration in certain theatre work with the Neptune Theatre and other regional theatres.

Some theatre classes by the nature of the work involved have a restricted enrollment. 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 evening work or classes.

Classes in the Degree Programme

Year 1.

1000 The Nature of the Theatre, 3 hrs.; Merritt, Overton and Zatzman; 6 credit hrs.

This class provides an introduction to the nature of the production process and theatre through lectures, discussion, demonstration, script analysis, and practical scene work.

1050 Theatre Organization and Stagecraft, Lecture 2 hrs.; Labs. and work in productions 3 hrs.; Perina and Staff; 6 credit hrs.

An introduction to theatre production, providing initial contact with scenography. Basic theatre construction, common materials used for construction, stage properties and costumes, knowledge of basic theatre lighting and sound equipment, and the methods and procedures for working with all of them efficiently, creatively and safely make up the substance of this class. Students who intend to enroll in the theatre honours programme must take this class. It is also a prerequisite for the scenography classes. Because of the required evening production work, those enrolling in this class must avoid permanent evening commitments other than departmental theatre activity during the academic year. There are certain lab charges connected with this class

***1300 Introduction to Film,** 3 hrs., Merritt; 6 credit hrs.

This class considers aspects of film history and theory, but its primary emphasis is on film criticism. Some films are presented in class, but students are also required to attend films presented at the Regional Film Theatre and elsewhere. The class presents reviews of films and considers such specific aspects as directing, acting, cinematography, editing imagery, and screenwriting. The intent of the class is to provide an overview of the nature of film, its effect on the public as a mass medium, and its dual role as both an art form and a commercial entertainment.

1500 An Introduction to Theatre Studies (Acting 1), 6 hrs.; Young and acting staff. Prerequisite for Theatre 2800. Entrance to the class is by audition only.

The first year in a course designed for the student interested in a professional acting career. The class concentrates on opening up and developing the emotional and imaginative range of the student through a series of improvisational and textual exercises. There is also concentration on the development of vocal and physical techniques for the actor. Emphasis is also placed on the disciplines necessary in the professional theatre.

Year 2.

2000 Threatre Performance 1, 4 hrs.; Overton; 6 credit hrs. *Prerequisite:* Theatre 1000.

Designed to provide exposure to the production/performance process for those who do not intend to pursue a career in the professional theatre. Through a workshop/discussion approach, basic performance problems are considered and the student is given the chance to experiment with various solutions in a performance situation. The ability to articulate solutions both verbally and nonverbally is developed. The class *may* result in a public performance.

2010 The History of the Theatre, Lecture, discussion, demonstration 3 hrs.; Andrews; 6 credit hrs. *Prerequisite:* 2nd year student.

A basic and comprehensive understanding of the development of theatre and drama. Emphasis is on the crucial phases of that development: the classical theatre of Greece, the theatre in the mediaeval period and in the Renaissance, and the rise of the modern theatre. This class is required for all students, majors, and in the honours programme, and is recommended for others who are in the second year of their university course. *Text:* O.G. Brockett, History of Theatre (3rd Edition).

***2020 Modern Dance,** 4 hrs. of movement; Richards; 6 credit hrs. (summer session only).

The theories and techniques of modern dance; the use of space, rhythm, dynamics, kinesthetics, aesthetic awareness and composition. The development of personal expression through the medium of dance is also encouraged within the class.

2060R Technical Scenography I, 6 hrs.; Perina *et al*; 3 credit hrs. *Prerequisite:* Theatre 1050.

This class is concerned with the progressively more complex problems of the preparation of theatre production in lighting, sound, construction, photography, and properties. The theory behind the operation of these crafts, the advances in technology and their expense and adaptability, forms part of this class. Lecture periods are concerned with Stage Management, Technical Drawing, Theatre Organization and Administration as well as other related topics. Workshop preparation in light and sound, darkroom, properties, and construction is integrated with crew responsibilities in department productions. There are certain lab charges connected with this class.

*** 2100A or B Dramatic Structure,** 2/3 hrs.; Merritt; 3 credit hrs. *Prerequisite:* First year writing requirement.

The analysis of plays as vehicles for performance, involving a detailed study and comparison of specific dramaturgical problems and the way they have been handled by various playwrights. Specific problems such as expository material, rhythmic/dramatic structure, and the orchestration of audience response are dealt with. The plays studied are drawn from a wide range of genres, styles, and historical periods.

2700 Scenography I, 6 hrs.; Perina; 6 credit hrs.

Designed to give students basic visual judgement and understanding. In the first half, it follows the Bauhaus approach to graphic design but adapts it to the needs of three-dimensional theatre space. In the second half the class teaches perspective; the final project is to integrate all the previous material and apply it to simple stage composition. Throughout the year analysis and criticism of various works are encouraged. The texts followed are Gyorgy Kepes' *Language of Vision* and Johannes Ihen's *The Elements of Colour*. Students wishing to take this class should consult with the instructor.

2800/2810 Acting II, 12 hrs.; Young and acting staff. *Prerequisite:* Theatre 1500 and 1050.

The second year of the actor training course. The concentration is on the development of textual, vocal and physical techniques for the actor. In the acting classes there is work on a series of scene study exercises utilising the emotional and imaginative work started in the first year. Added to this year are sections on textual analysis, yoga and an introduction to dance techniques for the actor.

Year 3.

3000 Theatre Performance III, 4 hrs.; Overton; 6 credit hrs. *Prerequisite:* Theatre 2000.

An exploration of the production/performance process on a more sophisticated level than Theatre 2000. Some performance experience is assumed among the participants, and the emphasis is on developing and refining performance skills. The class may result in a public performance.

3060R Technical Scenography II, 6 hrs.; Perina and staff; 3 credit hrs. *Prerequisites:* Theatre 2010, 2050C and 2700.

An advanced class in production technology. Students work intensively in one of the areas of: construction, properties, lights and sound, or stage management. Lecture periods are devoted to Administration, Publicity, Advanced Techniques, and other related topics. Lectures are common to all students. Each student serves as crew head for at least two departmental productions. There are certain lab charges connected with this class.

*** 3100A or B Practical Theatre Criticism,** 2 hrs.; Merritt; 3 credit hrs. *Prerequisite:* Theatre 2100A/B or permission of instructor.

The class is concerned primarily with the relationship between the critic and the play in performance. Some of the theoretical bases of criticism are considered, but the emphasis is on ways in which critics and critical theories can have a positive effect on the modes, methods, and styles of theatre production.

***3400 Seminar on Playwriting,** 2 hrs.; Murphy; 6 credit hrs.

A detailed study of plays for stage, radio, television and film. It deals with the purely creative play and that based on history or the novel. Material is drawn from modern classical plays, and from works of the teacher, from first notes to final draft, which have been produced in the various fields. The techniques of character development and plot construction, etc., are considered in depth. Playwriting submissions of the students are analysed and discussed.

3500 The Modern Theatre, 2 hrs.; Andrews; 6 credit hrs. *Prerequisite:* Theatre 2010 or permission of instructor.

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. Their implementation in particular plays and in theatrical practice is also examined.

***3600 The Playwright in the Theatre,** 4 hrs.; Merritt; 6 credit hrs. *Prerequisite:* Theatre 2100A/B.

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 rewritten.

***3710 Scenography,** 6 hrs.; Perina; 6 credit hrs. *Prerequisites:* Theatre 2010, 2060, and 2700. Acting students must consult with instructor.

For theatre honours and special scenography students only. It builds on the knowledge from the previous class in the field, Theatre 2700, as far as visual knowledge is concerned, and from technical knowledge acquired in Theatre 2060. 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*.

3800/3810 Acting III, 12 hrs.; Young and acting staff; 12 credit hrs. *Prerequisite :* Theatre 2010, 2800/2810.

The advanced class in the acting course. Added to the core acting, voice, text and movement sections are sections on singing for the actor and audition techniques.

Year 4.

4200/Education 4620/: Developmental Drama, 3 hrs. practice; Zatzman; 6 credit hrs.

A class which shows anyone involved or interested in the development of children 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. 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.

***4600 Directing,** 4 hrs.; 6 credit hrs. *Prerequisites:* Only available to honours theatre students who have taken Theatre 1050, 2010, 2700, 2800/2810 or 2000, and 3600.

The procedures that lead to theatrical events are analysed. Requirements include the directing of scenes from plays, and at least one fully achieved production. The class is normally only available to honours theatre students in the fourth year of their programme.

***4700 and *4710 Special Topics,** Faculty; 6-12 credit hrs. *Prerequisite:* Permission of department.

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.

***4800/4810 Acting III,** Young and acting staff; 6 credit hrs. *Prerequisite:* Theatre 3800/3810 and consult departmental chairman.

An advanced class in exercises and scene study, as well as interview and audition techniques.

***4900 Dramatic Theory and Criticism, and the Aesthetics of the Theatre,** 4 hrs.; Andrews; 6 credit hrs. *Prerequisites:* Theatre 2010 and 3500.

All of the arts face a profound problem in the attempt to establish criteria for evaluating creative activity. This class tackles that problem in the theatre. It looks at the various hypotheses and critical strategies that have been devised hitherto, and attempts to judge their present worth. It also asks what critical values are necessary for the survival and future growth of the theatre.

Classes in Costume Studies

These classes make up an entire programme. They are not available for credit towards degree, i.e. B.A. programmes. Students accepted for the Costume Studies programme concentrate their work solely on these classes, plus Theatre 1050 in the first year and Theatre 2010 in the second (if continuing to third year).

Year 1

1750 Costume Studies I, 4 hrs. daily. Doyle and staff. 30 credit hrs. *Prerequisite:* Permission of the instructor.

A basic outline of the history of costume; a history of textiles; pattern drafting; a designer's method for the media; and practical costume construction. There are certain lab charges connected with this class.

Year 2

2750 Costume Studies II, 4 hrs. daily. Doyle, visiting professional designers and staff. 30 credit hrs. *Prerequisite:* Theatre 1050 and 1750.

This covers advanced pattern drafting; decoration techniques; millinery; costume accessories; the wearing of costume; and costume making. There are certain lab charges connected with this class.

Year 3

***3750 Costume Studies III,** In residence and professional theatre apprenticeship. Doyle. 30 credit hrs. *Prerequisites:* Theatre 1050, 2010, and 2750.

On the basis of outstanding performance in the first two years, five or six students are selected for the third year. During this year, these chosen students are responsible for the total production of costumes required for use within the theatre department. It is intended that during part of this year the student is placed under the supervision of the Dalhousie course director to assist in bridging the gap between student projects and the profession. During this year, these students learn to direct and supervise hired staff within the specific needs of today's professional theatres. They also learn all aspects of budgeting related to costume design and manufacture for major stage productions. There are certain lab charges connected with this class.

Women's Studies

Although there is at present no programme in Women's Studies, the following classes are offered at Dalhousie University and may be taken as electives or form part of a major programme. For further information consult the Department under which they are listed. A B.A. programme in Women's Studies was approved by Senate and awaits approval by M.P.H.E.C.

Comparative Literature 215R Women in Literature & Society
Education 4020 Sex Roles
History 3350A Family & Community
History 3610A/B Women in Capitalist Society
History 3612A/B Women in Socialist Society
Philosophy 216A/516A Philosophical Issues in Feminism
Sociology/Anthropology 219 Sex Roles in Cultural Perspective
Spanish 209A Women in Latin America
Comparative Literature 210 Theories & Manifestations of Love in Mediaeval Europe
Education 4101A History of Western Educational Thought
Education 4290R The Adolescent
Education 4311A Psychology of the Exceptional Child
Education 4372B Social Psychology of Education
English 207R Canadian Literature
English 209R Twentieth-Century Fiction
English 234R The Short Story
English 354R Victorian Novel
English 453R Twentieth-Century English Literature
French 2021B La Femme en France et au Canada
Political Science 2400R Justice, Law, Morality
Political Science 255B Marxist Theory
Psychology 202A/B Psychological Aspects of Social Issues
Psychology 208A/B Social Psychology
Psychology 312R Issues in Clinical Psychology
Psychology 322R Community Psychology
Religion 100R Love, Death, Religions
Relgion 201R Western Religious Experience
Russian 327B The Russian "Heroine"
Sociology 220 Sociology of the Family
Sociology 307 Human Nature and Anthropology
Sociology 330 Cross-Cultural Study of Socialization
Spanish 211B Cuban Cultural Revolution
Theatre 201R History of Theatre
Theatre 350R The Modern Theatre