

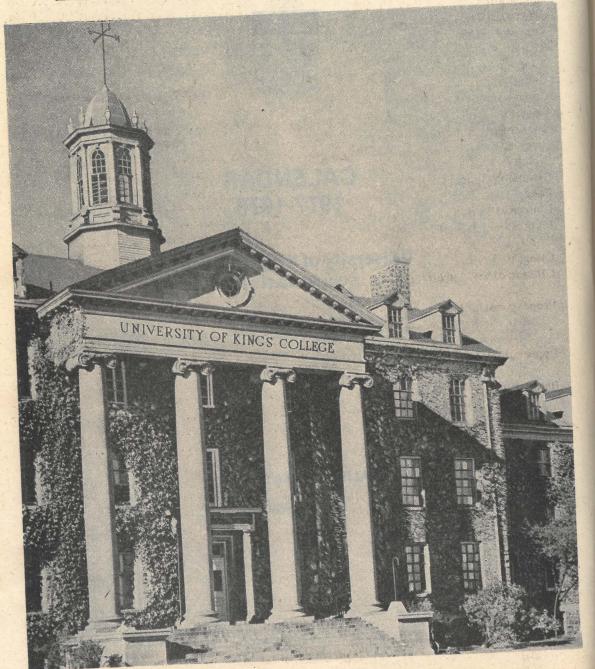
# CALENDAR 1977-1978

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

> HALIFAX, NOVA SCOTIA 189th SESSION

# **Registration Procedure**

During the appropriate registration period specified in the Academic Calendar, King's Arts and Science students will go first to Dalhousie and then to the Registrar's office at King's to: (a) submit approved selection of classes. (b) pay fees.



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# Regulations:

General Faculty	 	 	
University	 	 	
Residences	 	 	

# Scholarships, Bursaries, Prizes:

Art	s and Science		 	
Div	inity		 	
Student	Organizations		 	
Student	Services and Student Affa	irs	 	

# Almanac 1977-78

# July, 1977

# Friday, 1

Dominion Day

## Saturday, 2-

Last day for receiving applications from transfer students and those who did not meet the normal requirements for admission to Arts and Science.

Monday, 4 Summer School registration.

Tuesday, 5 Summer School classes begin.

Friday, 8 Last day for receiving applications for supplemental examinations, Arts and Science.

Monday, 25 Halifax Natal Day - No classes.

Friday, 29 Last day for receiving applications for admission to full time study, Arts and Science.

# August, 1977

Wednesday, 3 12:00 noon Dartmouth Natal Day.

### Wednesday, 17

Final day of classes, Summer School. Supplemental examinations begin in Arts and Science.

### Monday, 29

Last day for receiving applications for admission to part-time study Arts and Science.

# September, 1977

Monday, 5

Labour Day - No classes.

Wednesday, 14 Class approval, registration and payment of fees for new full-time students only in Arts and Science.

## Thursday, 15

Class approval, registration and payment of fees for new full-time students (morning only) and returning and part-time students (afternoon) in Arts and Classes begin in the Foundation Year Programme. Science.

Friday, 16 Registration and payment of fees for new and return. ing students in Arts and Science.

Saturday, 17 Morning: Registration and payment of fees for new and returning students in Arts and Science.

Monday, 19 Classes begin in Arts and Science.

Sunday, 25 University Church Service - Chapel 4:30 p.m.

Monday, 26 First day for change of course or class in Arts and Science.

Wednesday, 28 Registration and payment of fees for Extension Courses - 7:00-10:00 p.m.

### October, 1977

Monday, 3 Last day for adding classes (except "B" classes), Arts and Science.

Monday, 10 Thanksgiving Day - No classes.

## November, 1977

Friday, 11 Remembrance Day - No classes.

Monday, 14 Last day for withdrawing from "A" classes without academic penalty, Arts and Science.

# December, 1977

Thursday, 8 Last day of classes in Arts and Science. Classes end in the Foundation Year Programme.

Friday, 9 Examinations begin in Arts and Science.

Tuesday, 20 No classes, student holidays begin.

Monday, 26 Boxing Day. January, 1978

Tuesday, 3 Registration of new students. Classes resume (Regular and Foundation Year Programme).

Monday, 16 Last day for adding "B" classes, Arts and Science.

Friday, 27 Munro Day - no classes.

Saturday, 28 Winter Carnival - no classes.

Monday, 30 Last day for withdrawing from full-year or "C" classes without academic penalty, Arts and Science.

## February, 1978

Wednesday, 8 Meeting of Convocation 8:00 p.m.

Monday, 20 Study break commences.

Monday, 27 VIED TRANSMOUND Classes resume.

### March, 1978

Monday, 6 Last day for withdrawing from "B" classes without academic penalty, Arts and Science.

Friday, 24 Good Friday - No classes.

# April, 1978

Friday, 7 Awards Banquet Last day of classes, Foundation Year Programme.

Saturday, 8 Last day of classes, Arts and Science.

Monday, 10 Examinations begin, Arts and Science Friday, 21 Last day for submitting work, Foundation Year Pro-

gramme.

### Saturday, 29

Last day for receiving applications for admission from foreign students (other than Americans) Arts and Science.

May, 1978

Monday, 8 Registration and beginning of classes, Chemistry 240: (1st session of Summer School).

Wednesday, 10 Encaenia Day - 11:00 a.m. Baccalaureate Service. King's Convocation - 2:30 p.m.

Thursday, 11 Dalhousie University Convocations.

Friday, 12 Dalhousie University Convocations.

Monday, 15 Summer School registration (1st session).

Tuesday, 16 Summer School begins (1st session).

Monday, 22 Victoria Day - No classes:

June, 1978

Wednesday, 28 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, Q.C., B.A. (Vind et Oxon.), D.C.L. (Vind), LL.D. (Dal.), 177 Coltrin, Rockcliffe Park, Ottawa, Ont. K1A OA3

**President and Vice-Chancellor** J. Graham Morgan, B.A. (Nott.), M.A. (McM.), D.Phil. University of King's College, Halifax, N.S. B3H 2A1 (Oxon.),

### **Board of Governors** The Rt. Rev. G.F. Arnold, M.A., B.D., D.D., Chairman 5732 College Street, Halifax, N.S.

The Rt. Rev. H.L. Nutter, B.A., M.S. Litt., M.A., D.D., LL.D., Vice-Chairman 791 Brunswick Street, Fredericton, N.B.

The Rt. Rev. L.F. Hatfield, B.A., M.A., L.Th., D.D. Suffragan Bishop of Nova Scotia 5732 College Street, Halifax, N.S.

J. Graham Morgan, B.A., M.A., D.Phil., President University of King's College, Halifax, N.S.

Professor H.S. Granter, B.A., A.M., Vice-President 1171 Cartaret Street, Halifax, N.S.

Mr. Allan Conrod, C.A. Treasurer Piers, Conrod and Allen, Halifax Professional Centre, 5991 Spring Garden Rd., Halifax, N.S.

**Diocese of Fredericton** The Rev. T.W.F. Crowther, B.Sc., L.Th., 101 Alma St., Moncton, N.B. (1977)

Professor L.P. Edwards, D.C.L., 46 Grey St., Fredericton, N.B. (1977)

The Rev. Canon C.A. Hawkes, S.Th., 207 Cherry Avenue, Fredericton, N.B. (1975-79)

The Rev. Canon H.C. Quinn, B.A., L.Th., B.D., C.D., 269 Main Street, Saint John, N.B. (1975-79)

The Rev. Raymond H. Murphy, B.Th., 426 King Ave., Bathurst, N.B. (1975-79)

# **Diocese of Nova Scotia**

His Honour Judge J.E. Hudson, B.A, LL.B., D.C.L., 1473 North Postal Station, 2660 Agricola Street, Halifax N.S. (1975-77)

Mr. J.G. Morrison, B.Eng., 1047 Marlborough Avenue, Halifax, N.S. (1975-77)

The Rev. Peter Harris, B.A., M.S. Litt., Tangier, N.S. (1976-78)

The Rev. Emery Harris, B.A., M.S. Litt., B.D., 21 Lyngby Avenue, Dartmouth, N.S. (1976-78)

Mr. E.H. Fisher, 5732 College St., Halifax, N.S. (1975-77)

The Rev. Dr. J.B. Hibbitts, M.A., M.S.Litt., S.T.M., D.Phil., 1625 Preston Street, Halifax, N.S. (1976-78)

# **Alumni Association** Ms. Mary Barker, B.A.,

1149 Wellington Street, Halifax, N.S. B3H 3A2 (1975-77)

Mr. R.V.A. Swetnam, LL.B., 6897 Tupper Grove, Halifax, N.S. (1975-77)

Her Honour Judge Sandra E. Oxner, B.A., LL.B., 1354 Robie Street, Halifax, N.S. (1975-77)

The Rev. D.F.L. Trivett, B.A., L.Th., B.D., 2271 MacDonald Street, Halifax, N.S. (1975-77)

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Professor Colin J. Starnes, B.A., S.T.B., M.A., Ph.D., 1745 Henry Street, Halifax, N.S. (1976-78)

Professor R. MacG. Dawson, B.A., M.A., B.Litt., 941 Greenwood Avenue, Halifax, N.S. (1975-77)

# **Student Union Representatives**

Mr. Clement Whalley Miss Adrienne Malloy, BA. Miss Anne Musgrave Mr. Doyle Brown, B.A.

# **Co-opted Members**

Mr. G.R.K. Lynch, B.A., LL.B., C.L.U., Suite 450, 5991 Spring Garden Road, Halifax, N.S. B3H 1Y6 (1977)

Mr. R.G. Smith, 5905 Inglis St., Halifax, N.S. B3H 1K7 (1977)

The Very Rev. E. B. N. Cochran, B.A., L.Th., D.D., 5732 College St., Halifax, N.S. (1978)

Dr. Eric Balcom, D.C.L. Port Dufferin, N.S. (1978)

Mr. J.R. Ellis Bank of Montreal P.O. Box 2207 Halifax, N.S. (1979)

professor F. Hilton Page, M.A., D.D., 1135 Rockcliffe St., Halifax, N.S. (1976-79(

### **Executive Committee**

The Bishop of Nova Scotia The Bishop of Fredericton The President The Vice-President The Treasurer The Very Rev. E. B.N. Cochran Dr. E.W. Balcom Mr. G. R. K. Lynch Mr. R.G. Smith Mr. John Wiles Mr. B. V. A. Swetnam Dr. J. P. Atherton Prof. L. P. Edwards The Rev. T. W. F. Crowther The Very Rev. Raymond H. Murphy

**Representatives on Dalhousie** University Board of Governors

Mr. G. R. K. Lynch Mr. R. G. Smith

Representatives on the Governing Body of King's College School

The Very Rev. E. B. N. Cochran (1978) Prof. R. MacG. Dawson (1979)

# **Governors Emeriti**

Dr. D.S. Fisher, D.C.L., Rectory Lane, Sackville, N.B. Secretary to the Board of Governors

Miss R. E. N. Smith, B.A. University of King's College, Halifax, N.S. **B3H 2A1** 

Officers of Administration

J. Graham Morgan, B.A., M.A., D. Phil. President

Professor H.S. Granter, B.A., A.M. Vice-President

Professor W.J. Hankey, B.A., M.A. Director, Foundation Year Programme

**Miss Allison Conrod** Bursar

Mrs. G. S. Clark Registrar

Mrs. J.E. Lane, B.A. Librarian

The Rev. Robert Petite, B.A., M.Div., University Chaplain

The Rev. Canon J. H. Graven, M.A., L.Th., Divinity Secretary 11 2 M. A.B. Isilow J. H. Vall

Mrs. Iris Newman Executive Secretary Alumni Association

Mrs. Pearl Connelly, B.A., B.Ed. volt to good bits and Dean of Residence

Mr. R. M. Shoveller, B.P.E. Director of Athletics

Mr. J. N. Wilcox, Dip.J. Acting Information Officer, A.B. James 3. Horselorg.

Mr. J. N. Wilcox, Dip.J. Allela 1 and tending of the Executive Director, Fund Campaign

Mr. Allan Conrod. C.A. Treasurer Plars, Corrod and Alten, Hall notacovno2 to anaitto ush bRashisano The Honourable Mr. Justice R.A. Ritchie, Q.C., B.A., D.C.L., LL.D., Chancellor

J. Graham Morgan, B.A., M.A., D.Phil., Vice-Chancellor

The Rev. Robert Petite B.A., M.Div., Acting Clerk (1976-77)

### 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-

# **Academic Staff**

King's Faculty of Arts and Science (1976-77)

J. P. Atherton, M.A. (Oxon.), Ph.D. (Liverpool,) Associate Professor of Classics, 1104 Lucknow Street, Halifax, N.S.

F. F. Bail, M.A. (Giessen) Junior Fellow P.O. Box 45, Site 8 French Village, N.S.

R. N. Bérard, B. A. (Antioch), M.A. (McMaster), Junior Fellow 1714 Robie Street Halifax, N.S.

T. H. Curran, B. A. (Trinity), M.A. (Dal.), Junior Fellow University of King's College Halifax, N.S., B3H 2A1 R. MacGregor Dawson, B.A. (Trinity), M.A. (Tor.), B. Litt (Oxon.) Associate Professor of English 941 Greenwood Ave. Halifax, N.S.

H.S. Granter, B.A. (Dal.), A.M. (Harvard) Professor of History 1171 Cartaret St., Halifax, N.S.

W.J. Hankey, B.A. (Vind.), M.A. (Tor.), Assistant Professor of Humanities and Social Science, and Director of Foundation Year Programme, Specia Lecturer - Classics University of King's College, Halifax, N.S., B3H 2A1

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J. G. Morgan, B.A. (Nott.), M.A. (Mc.M.), D.Phil. (Oxon.), President of the University, Associate Professor of Sociology and Anthropology, University of Kings College Halifax, N.S.

F. Hilton Page, M.A. (Tor.), D.D. (Pine Hill) Professor of Philosophy, 1135 Rockcliffe St., Halifax, N.S.

C. J. Starnes, B.A. (Bishops), S.T.B. (Harv.), M.A. (McG Ph.D. (Dal) Assistant Professor of Humanities and Social Science Special Lecturer in German, Cherry Hill P.O., Lunenburg Co., N.S.

J. Stolzman, B.A. (Oreg.), M.S. (Fla. St.), Ph.D. (Oreg.) (Sabbatical 1976-77) Assistant Professor of Sociology and Anthropology, 1747 Beech St., Halifax, N.S.

H.G. Yesus, B.A. (Addis Ababa), M.A. (Illinois Brandeis), Junior Fellow, 2067 Beech St. No. 4 Halifax, N.S.

# **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 College 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 re-organization 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 a University for the education and instruction of youth and students in Arts, to continue forever and to be called King's College.'

Since that time, King's has maintained in Canada certain of the Oxford traditions. In 1920, when the original buildings were destroyed by fire, the University moved to Halifax, where, with the assistance of the Carnegie Corporation, new buildings were eventually erected on the campus of Dalhousie University. In 1930 it entered into partnership with Dalhousie which, with a Royal Charter dating from 1820, is the third of Canada's senior universities. This novel arrangement, by which the English and Scottish University traditions were united, is upheld by a special agreement under which the two 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.

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 continues to grant degrees in Divinity on the recommendation of the General Synod of the Anglican Church, but holds in abeyance its powers to grant degrees of D.D.

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, an integrated and interdisciplinary approach to undergraduate studies which is unique in Canadian higher education.

The University of King's College having entered an

association with Dalhousie University, the students registered in Arts and Science attend classes jointly with Dalhousie students. These classes are given by Dalhousie professors on the King's Foundation, depending on the course taken. The students of both institutions follow the same curriculum, take the same examinations, and must attain the same academic standard. The University of King's College Foundation Year Programme, however, is available only to students registered with the University of King's College.

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. Dinner in Prince Hall is formal with Latin grace; the wearing of academic dress is required of all members of the College in statu pupillari and the emphasis is everywhere upon the corporate life. 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 which stages two plays each year. 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 traditional 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.

Now that there are many large overcrowded universities which find it difficult if not impossible to concentrate upon anything not strictly connected with a student's graduation at the earliest possible time, there is all the more reason for the encouragement of the small residential university wherein the future leaders of society may be educated towards the acceptance of social and moral responsibility. The education of such people must be conducted on an individual, not a mass, basis.

King's tries to be a miniature of the Christian ideal of the larger community. It is this, rather than any more superficial resemblance, which links King's with the older universities of Britain and makes it unusual in Canada.

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; 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.

### Chapel

Regular Chapel services are an integral part of the community life afforded by the University, and all students are invited to attend them. The Chapel is an active part of campus life and students take a large responsibility for its operation. The times of service are announced at the beginning of each session and there is a wide variety of liturgical expression ranging from traditional forms to the contemporary. While the Anglican Book of Common Prayer is the standard usage, all students, regardless of denomination are welcome and encouraged to attend. There is a weekday Morning Prayer service, and an Evening Prayer service, conducted by the students as well as a daily Eucharist celebrated by the Chaplain and assisting clergy. There are special services throughout the year such as a Folk and Rock Mass.

The Chapel has a very active choir which sings at two of the main services of the week. There is a special emphasis on the singing of Gregorian Chant and liturgical hymns.

The University Chaplain is available to all students and faculty.

### **General Discipline**

The maintenance of discipline is in the hands of the College Board which is composed of the President, the Dean of Residence, President of the Students' Union, Chairman of the Men's Residence Council, Women's House President, three professors on the King's Foundation chosen annually by the Faculty. The students exercise a large measure of self-government in maintaining good order and discipline in the residences. Students conducting themselves in an unbecoming manner, within the precincts of the college, may be fined, suspended or expelled. When a student is expelled from residence there is no return of fees.

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 Dean of Residence.

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

Dons in the Bays, the Dean of Residence, 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.

### 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 the 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. 7:00 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. 6:00 p.m 10:00 p.m.

The student loan period for all books except those of reserve is one week.

Fines are charged for overdue books at the rate of wenty-five cents a day for seven day books.

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

### Degrees

The degrees of Doctor of Divinity 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.

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Convocation confers a Bachelor of Divinity (on recommendation of the Board of Examiners of the General Synod of the Anglican Church of Canada), and 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.



King's College Library

# **University Regulations**

All students are required to report their local address while attending the University, to the Office of the Registrar, on or before October 11. 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:

Under no circumstances may a student 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 Registrar.

### Withdrawal

See the individual faculty regulations, and the Fee Section.

Tuberculin Test: In the interests of public health in the University students are required 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

If a student so requests a copy of a medical certificate will be enclosed with the transcript.

### **Academic Discipline**

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.

Generally, in all matters delegated to the Faculties, an appeal from Faculty decision may be taken to Senate.

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 withdrawal from a Faculty because of failure to maintain adequate academic standing, the right to be considered for admission to another Faculty is unaffected.

### 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.

Alleged breaches of discipline relating to student activities under the supervision of the King's Student Union are dealt with by the Student Union.

Alleged breaches of discipline relating to life in the residences are dealt with by the Dean of Residence in consultation with the relevant Residence Council, and College Board.

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. Offences reported to the Secretary of Senate will be dealt with by the Senate Discipline Committee which may impose penalties in-

cluding the withholding of academic credit or suspen. sion 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 presen. tation 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 allega tions 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.

### **Dalhousie Libraries**

King's students enjoy the same privileges in the Dalhousie Libraries as Dalhousie students. For regula tions and hours see the current Dalhousie calendar.

### **Conferring of Degrees**

Successful candidates for degrees are ordinarily r quired to appear at Convocation in the proper academ costume to have the degree conferred upon them However, any student may elect to have his degree con ferred in absentia by giving formal notice to Registrars of Dalhousie and King's before May 5.

### **Exemptions Granted by Other Institutions**

Oxford University exempts from Responsions undergraduate in Arts of this University who has passe in the subjects of the second or a higher year. Bachelor of Arts with Honours is further exempted fro four terms of residence. The Trustees of Rhode Scholarships exempt from the qualitying containing of the scholarships exempt from Responsions by Oxfol If another province refuses continued coverage for Scholarships exempt from the qualifying examination

# STUDENT SERVICES/AFFAIRS

# 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 Counselling Service

Students concerned about any matter, whether a personal or learning problem, are invited to visit the Student Counselling Centre at Dalhousie, fourth floor of the Student Union Building. Counsellors with broad experience in assisting with problems offer a free confidential service to students.

# Tutors

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

# University Health Service

The university (Dalhousie) operates an out-patient service and in-patient infirmary in Howe Hall, at Coburg and LeMarchant Streets.

Furthur specialist services in a fully accredited medical centre are available when indicated.

# Medical Care - Hospital Insurance

Students must be able to provide proof that they are properly enrolled in any Hospital-Medicare scheme in their home province in order to qualify for service.

Canadian students remaining in Nova Scotia less than twelve months have their hospitalization paid by their home province. For residents of Saskatchewan and Ontario (and any other provinces with similar regulations) this requires that the student's premium for hospitalization Medicare be paid at home while they are absent to

students temporarily studying in Nova Scotia, they should contact the MSI office and include a copy of the refusal letter. MSI will then review the request for medical coverage.

Non-Canadian students who have resided in Nova Scotia for more than three months and show intention of remaining more than twelve months are regarded as residents of Nova Scotia and hence qualify for N.S. Hospitalization and Medical Services Insurances.

Any student who is not covered by any of the above insurance, private insurance must be obtained. Advice and applications at special rates are available through the Health Clinic.

# **Registration Requirements**

1. Any student who has had a serious illness in the previous 12 month period will be required to submit a statement from his family doctor.

2. All returning students are required to complete an annual medical questionnaire at the time of registration.

3. Students from overseas are required to submit a recent certificate of health.

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.

### **Tuberculin Tests**

The tuberculin tests and reading is a requirement for registration for all students attending King's.

### **Emergency Treatment**

In the event of a medical emergency students should telephone the University Health Service, 424-2172 or appear at the clinic in person.

## **Exclusions**

The University Health Service does not provide the following:

- (a) Medical or Surgical care other than that provided by, or arranged through, the University Health Service.
- (b) X-ray or Laboratory service, except as authorized by

the University Health Service.

- (c) Medications. (Prescriptions, drugs, etc.) (d) Dental treatment.
- (e) Treatment for illness attributable to misconduct.
- (f) Eyeglasses and examinations for same.
- (g) Costs arising as a result of pre-existing condition.

## Prescriptions ,

Medications prescribed by Health Service physicians or consultants to whom the student is referred by the Health Service may be paid by a prepaid drug plan operated by the Student Union. All other prescriptions are at the student's expense.

## **Athletic Programme**

All students in their first year of attendance at the University are encouraged to participate in some form of physical activity. Activities offered include field hockey, basketball, fencing, soccer, badminton, volleyball, swimming and hockey.

# **Canadian Armed Forces**

## Subsidization Plans

The Regular Officer Training Plan (ROTP), Medical Office 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.

# Admissions

# 1. General Statement

For further information on admission to the Faculty of Arts and Science, visit, write or telephone: the Registrars Office, University of King's College, Halifax, N.S. B3H 2A1 (902-422-5902).

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, which is 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.

### Definitions

(a) Undergraduates are students who are candidates for a Bachelor's degree, for a degree in a professional course, or for a diploma. (For details of admission to pro fessional courses, see entries in the calendars of the faculties concerned).

(b) Part-time students are students registered for three full credit classes or less. (Students registered for more than three full credits classes are full-time students).

(c) Special students are students who are not can didates for a degree or diploma but who wish to take one or more university classes. Such students may be admit ted if qualified. There are two categories of special students: no degree students, who may receive credit for classes taken; and auditors or audit students, who receive no credit and to whom no official transcript is issued.

(d) 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.

(e) Credits: See General Faculty Regulations 2.

### Special Cases

See the University regulations in the preliminary page of this calendar and Section 5 below, Admission o 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 t King's College is completion of at least five appropriat senior level university preparatory subjects as outline below. An average of 60% is Grade XII high school e amination, or the equivalent, is required. The Universit does not apply criteria mechanically. It reserves the rig to refuse admission and also has discretionary powert admit students who do not meet the normal quirements, but who appear acceptable on oth grounds. Any student who submits the appropria documents will be considered for admission.

# **Early Admission**

Students who have been receiving good marks (a gene average of 65%\* or more) will be considered for adm sion before the final results of their senior year a known. Such students are encouraged to apply early d ing their last year at school. \* 70% from 1978/9

## **Application Procedure**

Candidates for admission to the Faculty of Arts Science must submit a completed application (available from the Admissions Office, or from most h schools) to the Registrar, King's College, as soon possible after January 1st, and normally not later th August 15th. To complete the application, a candida must provide:

(a) evidence of successful completion of Grades XI and (a) evidence University Preparatory Programme (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.

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

# Preparation for Admission

students wishing to study at King's College should choose their high-school subjects from a University Preparatory Programme. They should read the sections of the Calendar headed Degree Programmes and Programmes of Study, and in particular, the description of the first-year programmes. Many departments make suggestions about high school preparation in the descriptions of their own introductory programmes. (These are found in the section entitled Programmes of Study). Students who lack preparation (in Grade XI and Grade xII) in Mathematics, English, and at least one other language may find themselves initially cut off from certain programmes. Guidance councellors in high schools can also offer advice on the suitability of individual high school programmes. Another source of advice is the Registrar's Office, which will arrange interviews, whenever possible, between prospective students and members of the faculty.

## Note: From 1978/9, the following will apply:

At least five senior level subjects must be taken. All students are required to have taken senior level English and at least two other senior classes from among Biology, Chemistry, French, German, History, Latin, Mathematics and Physics. The remaining required classes may be chosen from the above list or selected from among 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.

### 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 1st in order to ensure prompt and efficient handlina

Applications from all other countries must be received by May 1st. (Students from Great Britain or the West Indies who write GCE qualifying examinations in June may request an extension of this deadline if they can ensure that their examination results will be available to the Admissions Office by August 21st; otherwise the May 1st deadline must apply.)

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.

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

### Other Countries

(e) USA: first year at a recognized university or similar institution of higher learning (minimum: 30 semester hours). Students of lesser standing will be considered if they appear exceptionally well qualified, for example on the basis of CEEB scores or advanced placement work.

(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) 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 1st. Other Countries: May 1st. 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.

### **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 for a general degree in two years, or for an honours degree in three years. Such transfer is regularly accepted from the Convent of the Sacred Heart in Halifax, or the Nova Scotia Teachers' College, or Nova Scotia Agricultural College in Truro.

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 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 general Bachelor's degree or the principal subject requirement of an honours programme without specific approval from the departments concerned at Dalhousie.

f) Transfer credits may be granted only for classes equivalent to classes offered at King's, and only in subjects recognized as having standing in a faculty of Arts and Science.

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 lack. ing 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 fitting them for university studies.

# **General Faculty Regulations**

Changes of Regulations usually become effective upon publication in the Calendar of the Faculty of Arts and Science. 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 fo relief through the Registrar to the Committee on Studies at Dalhousie.

### 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 ment in which the student intends to add the class, as filiated institutions. well as the approval of the class instructor.

### **Duration of Undergraduate Studies**

A student is normally required to complete hi undergraduate studies within ten years of his first registration.

### Auditing

with the permission of the instructor concerned, audi any class in the Faculty of Arts and Science, provided that it is clearly understood that he will not be eligible to write examinations in the class and will not in any ci cumstances be granted credit for it.

### **Advanced Placement'**

Advanced Placement A student possessing advanced knowledge of a subject A credit toward a degree is earned in a full-credit class, a which he has acquired otherwise then at a university class in which typically there are two to three lecture which he has acquired otherwise then at a university hours which typically there are two to three lecture will be encouraged to begin his studies in that subject a hours weekly for the regular. (September to May) a level appropriate to his knowledge, as determined by academic year. Credits may be obtained for universitythe department concerned, and will be exempted from level studies any classes which are normally prerequisites for the one a)normally during the regular academic year; or excepany classes which are normally prerequisites for the student must finally during the regular academic year; or to which he is admitted. However, the student must finally substitute for the exempted classes an equal number <sup>a</sup> <sup>b)during</sup> a summer session or by correspondence,

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).

# 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 of 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 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) 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 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 qualify for a General degree as well as satisfy the Dalhousie-King's requirement for honours.

## Concurrent Registration at University of King's College and Another Educational Institution

Ordinarily no student may register at King's if concurrently taking work in another educational institution. who wish to add classes after two weeks from the com- Regulation 8 below outlines procedures to be followed mencement of the term in which the class begins would to secure waiver of this general regulation. Regular exhave to get the approval of the chairman of the depart ceptions are made with respect to registration at af-

# Forced Withdrawal Consequent on Unsatisfactory Performance

When the work of a student becomes unsatisfactory his case will be discussed by the Committee on Studies which may require him to withdraw from the class or classes concerned and to be excluded from the relevant examinations, or may advise him to withdraw temporari-A full-time student registered at King's College may by from the University or to reduce his class load.

2. Credit and Assessment

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 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 30 for Spring 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. 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; without 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

The passing grades are A+, A, A<sup>+</sup>, B+, B, B<sup>+</sup>, C+, C, C<sup>+</sup> and D. The failing grades are F/M and F.

## 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 100-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 (A, B, C or R) and 4900 and Music 360R and 460C. 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. 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 Registrar'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.

Departments 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 or 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.

### **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 Dalhousie 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 department - 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 Regulation).

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 Jul 10th for supplemental examinations to be written August, and by January 28th for supplemental examina tions to be written in February.

A student who fails to pass the supplemental examina tion 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 the same class in the same year.

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

No more than five passes obtained as a result of sup plemental examinations may be counted toward degree.

# **Repetition of Classes not Passed**

Except a provided in Regulation above, a student car gain credit only by repeating a class which he has no passed.

# 3. Merit Points and Minimum Standing

Merit points are awarded for each class as follows:

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

Note that although D is a passing grade, no points a awarded. For fractional credit classes, corresponding fractional merit points are awarded. (e.g., in a half-cret class, an A would yield 1 1 / 2 points). Students receiving credit for classes taken at another institution are n awarded points for those classes.

# Minimum Standing for a General Degree

In order to qualify for the award of a general degree, ca 5. Summer School and Correspondence Classes didates must have obtained a minimum of twelve m points on the fifteen classes required. This minimum adjusted in proportion to the number of Dalhous Limits on Credits credits received relative to the number required.

# **General Degree with Distinction**

A general degree will be awarded "With Distinction" student who has achieved an aggregate of 40 points the 15 classes taken for his degree or a proportion figure if he has taken more than 15 classes. Repea classes count as additional classes in this context.

Note again that classes taken at another institution not awarded merit points.

### Minimum Standing for an Honours Degree Students in honours courses are expected to main an overall standing of at least C in each year of stud they fail to do so, they may be required by the Com tee on Studies to transfer to a general degree course.

# 4 Regular Academic Year

# Workload

Five classes shall be regarded as constituting a normal year's work for a student, and may not be exceeded without written permission from the Committee on studies. Such permission will not normally be granted to any student who is in his first year of study or to any student who, in the preceding academic year, has failed any class or had an average of less than B-.

# Failed Year

students who have not passed at least half of the classes for which they are enrolled, 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 Faculty 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 department concerned and the endorsement of the Committee on Studies, 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.

Up to five credits from Summer School and correspondence classes may be accepted towards the requirements for a degree, not more than two of them by correspondence. Such 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 King's

# Maximum Workload

No student may take classes totalling more than one full credit in any one Summer School session. Not more than two full credits can be obtained at Summer School in any one academic year.

Exceptions will normally be granted by the Committee on Studies 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 Dalhousie, a Summer School class to be counted for credit towards a Dalhousie-King's degree must:

(a) obtain an application form from the Office of the Registrar at Dalhousie University;

(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 Dalhousie University 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 if favourable, the receiving university will be so advised by the Registrar's Office.

### **Correspondence Classes**

A regulation similar to the above 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.

### 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.

### 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

A student, while registered at 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. A letter of permission will be provided if approval for the classes is given by the appropriate department.

The class fee will be paid by Dalhousie if: (a) the student is registered as a full-time student at Dalhousie-King's:

(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.

### 9. 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 and by the Registrar at Dalhousie.

### Withdrawing from Classes

(a) The last day for withdrawing from a class without penalty is: for A classes: 16th November, for B classes: 1 week after study break, for C classes: 31 January, for full year classes: 31st 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).

(d) A student may not transfer from full to part-time status by withdrawing from classes after the deadlines listed (see Regulation).

### Withdrawing from the University or Changing to Parttime Status

A registered student who wishes to withdraw from the University, or one who wishes to withdraw from the University, or one who wishes to change from full-time to part-time status, must write to the Registrar at Dalhousie and King's explaining his circumstances. In either case, 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 situation with the Dean or the Assistant Dean of Student Services at Dalhousie and the Registrar at King's.

### **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 per formance 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 length experimenta 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.

# **programmes of Study**

# FACULTY OF ARTS AND SCIENCE

King's offers 4 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 provides an alternative to the ordinary B.A. and B.Sc. first year programmes.

The ordinary first year programme consists of five classes.

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 4 classes, for B.Sc. students it is equivalent to 3 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.

# 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 interdisciplinary 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, etc..

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The Foundation Year Programme is a new approach to the first year of University. 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 students 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

G. Alfaro, B.A. (Col.), M.A. (Berk), Ph.D. (Harvard), Associate Professor of Spanish.

A.H. Armstrong, M.A. (Cantab), Professor of Classics and Philosophy.

J.P. Atherton, M.A. (Oxon), Ph.D. (Liverpool). Associate Professor of Classics and Chairman of the Department.

R. D. Crouse, B.A. (Vind.), S.T.B. (Harvard), M.Th. (Trinity), Ph.D. (Harvard), Professor of Classics.

J. Farley, B.Sc. (Sheffield), M.Sc. (West. Ont.), Ph.D. (Man)

Associate Professor of Biology.

R Friedrich, Ph.D. (Gott.), Associate Professor of Classics and German.

B. E. Gesner, B.A., B.Ed., M.A. (Dal.), Assistant Professor of French.

Y, Glazov, Ph.D. (Oriental Institute, Moscow), Professor of Russian and Chairman of the Department.

J. F. Graham, B.A. (U.B.C.), A.M., Ph.D. (Col.) Fred D. Manning Professor of Economics.

W. J. Hankey, B.A. (Vind.), M.A. (Toronto), Assistant Professor of Humanities & Social Sciences, Special Lecturer in Classics, Director, Foundation Year Programme.

S. Jones, B.A. (Benn.), M.A. (California-Berkeley), Ph.D. (Harvard).

Associate Professor of Spanish and Chairman of the Department.

J.R. Lawler, B.A., M.A. (Melbourne), Ph.D. (Paris), McCulloch Professor of French and Chairman of the Department.

K. E. vonMaltzahn, M.S., Ph.D. (Yale) George S. Campbell Professor of Biology

J. G. Morgan, B.A. (Nottingham), M.A. (McMaster), D.Phil. (Oxford), President, Univ. of King's College and Associate Professor of Sociology.

N. G. O. Pereira, B.A. (Man.), M.A., Ph.D. (Berkeley), Associate Professor of History and Russian.

R. P. Puccetti, B.A. (III.), M.A. (Tor.), Ph.D. (Sor.), Professor of Philosophy

R. Ravindra, B.Sc. (I.I.T.), M.A., Ph.D. (Tor.), Associate Professor of Physics and Religion.

W. C. Smith, B.A. (Tor.), M.A., Ph.D. (Prin.), McCulloch Professor of Religion and Chairman of the Department.

S. E. Sprott, M.A., B.D. (Melb.), Ph.D. (Col.), Professor of English.

C. J. Starnes, B.A. (Bishops), S.T.B. (Harvard), M.A. (McGill), Ph.D. (Dal.), Assistant Professor of Humanities and Social Sciences,

Special Lecturer in German and Classics.

D. H. Steffen, Ph.D. (Goettingen), Associate Professor of German and Chairman of the Department.

J. B. Stovel, B.A. (Sir G. Wms. et Camb.), Ph.D. (Harvard), Assistant Professor of English.

Junior Fellows: 1976-77

F. F. Bail, M.A. (Giessen) R. N. Berard, B.A. (Antioch), M.A. (McMaster) T.H. Curran, B.A. (Trinity), M.A. (Dalhousie) H. G. Yesus, B.A. (Haile Selassie), M.A. (Illinois et Brandeis)

# **Admission Requirements**

The admission requirements are those pertaining to the faculty of Arts and Science, i.e. Nova Scotia Grade XII or its equivalent. The normal standard is five approved academic subjects with an average of 60%. An approved course consists of at least four classes chosen from English, History, Languages, Mathematics and the Sciences and one other class. Students who have chosen to depart from these requirements, because of specific interests and aspirations, should not hestitate to apply for admission. They will be considered on the merit as individual cases. Mature students, student whose education has been interrupted and who do no meet the normal admission requirements, but who car demonstrate that there is a reasonable likelihood of suc cess 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 and students not in the University Preparatory Pro gramme are also considered for admission on their in dividual merits.

### Scholarships

Scholarships of \$1000., \$800. and \$500. are open t students entering the Foundation Year Programm Application for admission constitutes application for scholarship. In recent years more than one quarter of th entering students have received awards. Scholarship provided from monies given in memory of Henry Cousins and Dr. Norman H. Gosse are open only students entering the Foundation Year Programme.

# **Grading and Credit**

The Programme is to be regarded as a complete unit. It not possible for students to enrol in only part of course. Evaluation of the students' performances is c tinuous and made on the basis of tutorial participal and essays. There are no examinations. The final gra is a composite of all evaluations. Final grading is result of discussion among all those teachers who ha had grading responsibilities. Grades are given in te of the letter grade system of the Faculty of Arts a Science.

Successful completion of the Programme g students in the K100 course twenty four credit hours four class credits toward a Bachelor of Arts or Bache

achieve a complete first year. Students taking K110 do achieve a solution 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. Normally students taking K100 would be class of the Bachelor of Arts degree and students taking K110 will be candidates for the degree of Bachelor of Science but exceptions may be made

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

sociology (except for courses in Anthropology).

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 Bussian.

In addition the following departmental provisions have been established:

### Biology:

Successful completion of the Foundation Year Programme supplies the prerequisites for Biology 3400, 3401A, 3410B. These are courses in the history of science, the history of biological sciences and man in nature.

### German

Successful completion of the Foundation Year Pro-. gramme may be regarded as a substitute for German 221.

### **Economics**

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

## Philosophy:

Successful completion of the Foundation Year Programme may be regarded as a substitute for Philosophy 230.

# Religion

The Department of Religion recognizes the Foundation Year Programme as satisfying the prerequisites for Religion 201, 202 and 351.

# 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 preprofessional work they require for admission to their respective faculties and schools. The University of King's College has made the same provision relative to the first year of its proposed degree in Journalism. Students may substitute the Programme for the appropriate requirements laid down by these faculties; for details of of Science degree. These students do one other class these provisions consult the Director of the Foundation

Programme

follows:

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

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 Don Giovanni, early Greek urns, Michelangelo's - Holy Family, the Bamberg Dom; these are usually understood to belong to the disciplines of music, archaeology, art history and architecture. We read Homer's Iliad, Marlow's Faust, Dicken's Hard Times; 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 philosophy, theology and religion. We study Huizinga's The Waning of the Middle Ages, Rousseau's Social Contract, Marx's Capital, Heibroner's The Making of Economic Society: works thought to belong to history, political theory, economics and sociology. We read selections from Copernicus' On the Celestial Spheres, Newton's Optics, Darwin's On the Origin of the Species; texts taken from the history of astronomy, physics and biology.

periods.

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

### **Course Designation, Lecture and Tutorial Hours**

The formal designation of the Programme courses is as

### **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.

### **Outline of the Foundation Year Programme**

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

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. *Co-ordinator*: Dr. Atherton.

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 in Dante's Divine Comedy. Co-ordinator: Dr. Starnes.

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. The discovery of the new world and the counter-Reformation culture of Spain are new elements added to this unit. *Co-ordinator:* Professor Hankey.

4. The Age of Reason or the enlightenment: 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. Goethe's *Faust* is its literary center. *Co-ordinator:* Dr. Steffen.

5. The Triumph of the Bourgeoisie: 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. Marx provides a crucial analytical focus; novels provide a new form of literary experience. *Co-ordinator:* Dr. Morgan.

6. The Contemporary World: From the decline of the European empires to contemporary industrial society. The emergence of one world order and the division and specialization of culture are poles within which the treatment moves.

The following are the recurring general topics which are discussed in each of the units outlined above. (a) Political institutions, the modes of authority, concep-

tions 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.

### Evaluation

The mark for the course is based on students' paper and their class participation. No student will be able pass the course without completing the written quirements. Students registered in K100 will write least two essays for each unit. Students in K110 write least one essay for each of these units. Some of the additional work of students in K100 will relate to the Thursday lectures which are required for them but no for students in K110. Generally the additional Thursday lectures will consider one text or topic in detail during the while unit e.g. in 1977-78 Section III will read Ce vantes, Don Quixote; Section IV: Goethe, Faust, and Section V: Dostoyevsky, Crime and Punishment. Mart

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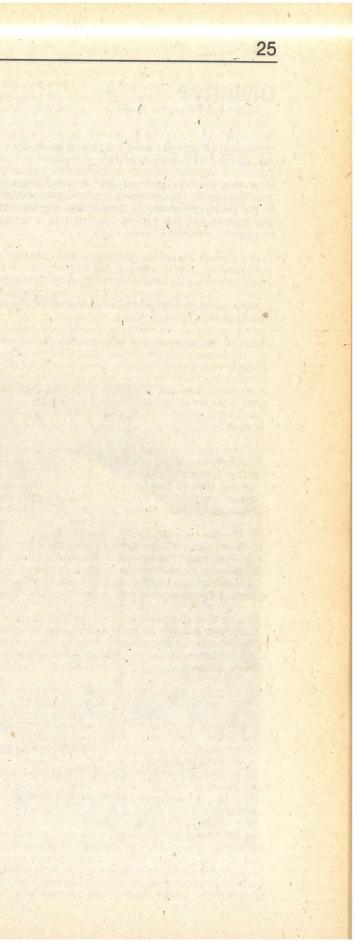
# Required Reading (1976-77)

The following list of required reading for 1976-77 give an indication of the theoretical works through which o understanding of these aspects of our culture developed.

This is a list of the reading required for arts studer (K100) and science students (K110). The items marked are required reading for arts students but not for scien students.

Akkadian Creation Epic Theogony selections Hesiod Iliad Homer Oedipus Rex Sophocles Antigone Sophocles Oedipus at Colonus\* Sophocles The Republic Plato The Ancient City Coulanges The Fourth Eclogue Virail Genesis 1-3 The Bible Exodus 3, 19, 20 Job 1-14 and 40-42\* Epistle to the Romans 1-8 Epistle to the Ephesians 1-6 Vita Constantinae Eusebius (selections) The City of God Augustine (short selection) The Song of Roland Sayers (trans) Feudalism Ganshof Regula St. Benedict (extensive selections) Medieval Philosophy Wippel and (extensive selections) Wolter Summa Theologica, Aquinas Questions I and II Aeneid, Book VI Virgil Divine Comedy: Inferno, Purgato Dante and Paradisio The Waning of the Middle Ages Huizinga Oration on the Dignity of Man Mirandola (short excerpt) The Prince Machiavelli Thomas More Utopia Birth of the New Physics Cohen Dr. Faustus Marlowe The Conquest of New Spain Diaz

n Luther	"The Freedom of a Christian" "An
a	Address" and other selections
ntes	Don Quixote
artes	Mediatations on First Philosophy,
	Principia
	"Author's Letter"
es	Leviathan, Books I and II
	Second Treatise of Government
	(selections)
	An Inquiry Concerning Human
- · · · ·	Understanding
	(a selection)
	The Critique of Pure Reason
	(extract)
	"The Significance of the Newtonian
	Synthesis"
all	The Construction of Modern
	Science
	-Chapter 1
eau	The Discourse on the Origin of
	Inequality The Social Contract
е	Faust Parts I and II*
eist	Prince Frederick of Homberg
9	Signs of the Times, "The
	Mechanical Age"
queville	The Old Regime and the French
- 1302 - 1	Revolution
man	Darwin*
	On Liberty
3	Socialism Utopian and Scientific,
	"Letters on Historical Materialism"
nd	Manifesto of the
	Communist Party
	Wage Labour and Capital
worth	Lyrical Ballads, Preface
IS	Hard Times
revsky	Crime and Punishment
mith	Religion as Symbolism
	Dilemmas, Pleasure
gaard	Philosophical Fragments
	Existentialism and Humanism
olf	Peasant Wars of the Twentieth
	Century
Grant	Technology and Empire
	(three essays)
	Lament for a Nation,
	Chapter Five
ot	The Waste Land
ner	The Making of Economic Society
aux .	Man's Fate
d	Civilization and its Discontents
and the second	



# Divinity

Director of Parish Field Work and Divinity Secretary Rev. Canon J. H. Graven, M.A. (Dal.), L.Th. (Vind.).

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 Kina's College.

King's College remains a recognized institution for the conferring of divinity degrees and diplomas on recommendation of the General Synod of the Anglican Church.

Divinity scholarships awarded by King's College are tenable at the Atlantic School of Theology.

Details of the basic course requirements and offerings

of the Atlantic School of Theology are given in a bulletin published separately, and available from the School or from King's Registrar on request.

Master of Sacred Theology (M.S.T.) In conjunction with the Institute of Pastoral Training, the University of King's College offers the degree of Master of Sacred Theology in the field of pastoral care. Par. ticulars concerning regulations for this degree may be obtained from the Executive Director of the Institute of Pastoral Training at the University of King's College. A degree in Divinity is a prerequisite.

# Bachelor of Divinity (B.D.)

Students who have received the M.Div. B.S.Litt., or B.S.T and graduate students who have qualified for the L.Th may proceed to the final examination for the extra-mural degree of B.D. under the General Synod Board of Ex. aminers. By agreement among all Anglican Theologica Colleges in Canada, the Degree of Bachelor of Divinity is now awarded only by examination by the Board of Ex aminers of General Synod. (No new registrations after November 30, 1973).

King's College Chapel

# Institute of Pastoral Training

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

The organization of the Institute, by collaboration of university of King's College, Pine Hill Divinity Hall, the nivinity 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.

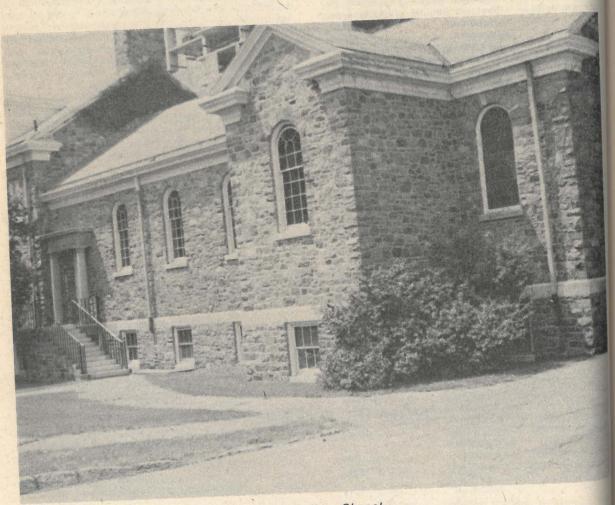
While the above mentioned courses aim primarily at increasing the pastoral competence of the parish minister of church worker, students of particular aptitude and interest can be guided in further theological training to become qualified teachers of these subjects in theological courses, directors of 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 Direclors, and members have served on the Council's Committee on Accreditation and Certification.

Other goals of the Institute include the production of teaching materials, the promotion of workshops, and the establishment of a library and reference center at the Institute office.

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

This course consists of 25 evening sessions of two hours each. While there is some review of the material given in the general course, Journalism 100, the main focus of Journalism 200 is the study of the human interest feature story. The student is instructed in the technique of researching story material and in writing stories for publication. The course is recommended for those who wish to test their writing skills and evaluate their potential as professional writers. Academic qualification is waived, the only prerequisite being a sincere interest in writing.



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at that time.

A. Public Relations (A Survey of the Entire Field) Instructor: G. Hancock, B.A., Dip. Journ, 25 sessions of 2 hours each. October to April

These lectures attempt a practical application of the theory of communications. Subjects discussed include: History and Philosophy of Public Relations, communications research (persuasion and public opinion), interpretation of problems, planning and action evaluation, improving PR standards, image, language of public relations, the publics (shareholders, employees, customers, the community), PR for business and industry, utilities, welfare agencies, churches, schools, government; technique of communications (mass media, printed and spoken word, films, speeches, displays, advertising), case histories. Seminar discussions include letter writing, human conflicts and publicity.

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

All enquiries concerning courses offered should be addressed to the Executive Secretary of the Institute of Pastoral Training, University of King's College, Halifax, N.S. Board and lodging can usually be arranged and some bursary assistance is forthcoming. Academic credit is given by certain Canadian and American colleaes, including the Atlantic School of Theology, for satisfactory completion of Clinical Pastoral Education courses. Applications to attend the courses from bona fide enquirers belonging to other professions are welcomed and receive equal consideration

# **Extension Courses**

Extension courses are given in the evenings at the University of King's College. These courses are available in a number of topics. All extension courses are designed for their general interest and are not taken as credits in degree programmes. Academic requirements for admission are not necessary, the expectation being simply that persons who enrol in the courses will do so on the basis of their interest in pursuing the topic. Specific courses to be offered are announced in the Fall

Registration for all courses will occur on the evening of September 28 from 7:00 to 10:00 p.m., fees being payable

## 1976-77 Courses

# **Fees and Charges**

# Academic and Related Fees

Fees are subject to change. Those payable in 1976-77 are as follows:

Full time students are students registered for more than three credits

Faculty	University Fee	Society Fee	Total	In Full at Registration	OR	Payable in 2 instalments (incl. carrying charge of \$5) At Registration Bal. Jan. 20
Arts and Science	720.00	1.50	721.50	721.50	Sontan Sontan	470.00 256.50

26.00

(A student enrolled at King's is required to pay the King's Student Union fee of \$41.00, 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 \$30.00).

# **Part Time Students**

Total fees payable at registration

Total fees payable at registration Students registered for a total of three full less, for session, per course —	credits, or
1 full credit class (University fee \$150. & Student Union fee \$5.)	\$155.00
1/2 credit class (University fee only)	.77.50
1/3 credit class (University fee only)	52.00

Students registered for a total of three one-half credit courses, or less, per course -1/2 credit class 77.50 (University fee only) 1/3 credit class 52.00 Students registered for more than a total of three one-(University fee only) half credit courses (University Fee \$375.00 \$400.00 & Student Union Fee \$25.00)

# Audit or Occasional Students

Fee payable at registration Students, not candidates for credit, who wish to attend a class because of their intérest in it.

No credit or official transcript will be issued. A student who registers to audit a course and during the session wishes to receive credit for the course must receive approval from the Registrar and pay the difference in fee, plus a transfer fee of \$25.00. 77.50 1 full credit course 38.75

1/2 credit course 1/3 credit course

# **Regulations for Payment of Fees**

Fees must be paid in Canadian funds by cash negotiable cheque. If payment is made by cheque retur ed by bank as non-negotiable the account cannot considered paid. Penalties will be charged totall \$25.00 (\$20 for late payment + \$5 for cheque returned b bank). Post-dated cheques cannot be accepted.

Fees are due and payable at registration but if preferre payment may be made in two instalments, the fi payable at registration, the second on or before Januar 20. A carrying charge of \$5.00 is added if fees are n completely paid at registration. Registration is not cor plete until the first instalment is paid.

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

Students planning to pay the first instalment of fe from a Canada Student Loan should apply to their Pro from a Canada Student Loan should apply is available. Cashier Dalhousie in February of each year. registration.

# Penalties for Late Payment

Students unable to pay for the first instalment due to the Charges fees may register conditionally. A penalty of \$5.00 1 day, to a maximum of \$25.00, commencing on the f day, to a maximum of \$25.00, commencing on day, <sup>a</sup> **Identification Cards** business day following the regular registration day, <sup>a</sup> **Identification Cards** be charged. To accounts outstanding after, Septem<sup>b</sup> All new, full and part-time students will be issued an 30, an additional charge of 11 1/2 per cent interest from dentification card upon registration and payment of pro-University.

Penalty and interest charges will be waived for stude Laboratory Charge Penalty and interest charges will be ware to be the local to the second tober 31 and give evidence of having received the loss of a careless or wilful damage. their application for a provincial loan has been reject Examinations and pay accounts by October 31 will also have pent An application for a supplemental examination must be and interest charges waived. Students who receive Paccompanied by the proper fee... province after October 31 and pay accounts with serveplemental and Special Examinations days may have the penalty charges waived, but inter Perexamination will be charged from October 1. Proof must be provis to the Awards Officer that an application for a provin-

loan was made prior to August 15 and the payment or notification of rejection of application had not been received by October 31.

Interest at 11 1 / 2 per cent will be charged on second in-Interest at outstanding after January 20. No examination results will be released, nor will the student be permitted to register for another session until all accounts are paid in full. The names of graduating students whose accounts are not completely paid by April 26 will not be included in graduation lists.

# part-time Students Audit Students

Fee must be paid at registration.

# Application Fee

An application fee of \$10.00 must be forwarded with the application form submitted by all students applying for registration for the first time in the Faculty of Arts and Science.

This \$10.00 fee is not refundable and is not to be applied as a credit to class fees.

### Late Registration

students are required to register on the regular registration dates. Late registration requires the approval of the Registrar, and payment of an extra fee of \$5.00 per day. to a maximum of \$25.00.

### **Fees Deductible For** Income Tax

The amount of fees constituting an income tax exempion 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 (\$41.00 or \$5.00, 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

30, an additional charge of 11 172 per cent interest benchication card upon registration and payment of pro-October 1 will be added. Students whose accounts a per fees. If these cards are lost, replacement will be 30 days in arrears are subject to withdrawal from <sup>1</sup> made at the Registry Office, Dalhousie, upon payment of a \$2.00 fee

Æ	Atra fee fee	\$15.00
ctr	entra fee for each examination written at an outsid	e cen-
	***************************************	\$10.00

Transcripts

# **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.

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 \$20.00.

Students with motorbicycles may obtain parking permits under the same conditions for a charge of \$5.00, and will be required to park them in a designated area.

**Refund of Fees** A student who has completed registration and wishes to withdraw must obtain written approval from the Registrars of Dalhousie and King's.

Until this is done a student is not entitled to any refund of nor exemption from unpaid fees.

A student who has preregistered and cancels his registration before the first day of classes will be entitled to a full refund of fees.

A student withdrawing within two weeks of the date of commencement of classes will be charged a registration fee only of \$25.00 if registered full time, \$10.00 if registered part time.

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 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.

Fee for re-marking a paper is \$3.00. Application for remarking must be made in writing to the Registrar Dalhousie within two months of the date of examination. Fee will be forfeited unless application for refund is made on or before July 31.

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### Degree in Absentia

A graduating student must notify the Registrar prior to May 9th if he does not plan to be present to receive his degree. If this notification is not given and the student does not attend the graduation ceremony, a charge of \$10.00 is required before the degree is released.

An application for a transcript must be accompanied by the proper fee. First transcript, no charge; additional copies, each original, \$1.00; extra copies, \$.50 each. No transcript will be issued until all charges owing to the University have been paid in full.

### Student Photograph

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.

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 proper authority has been obtained. N.B. - King's College students must report AS WELL to the Bursar, King's Col lege.

# Fee For Student Organizations

At the request of the King's student body, a fee of \$41.00 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.

The following schedule shows Residence Fees and Meal Charges applicable during the 1976-77 academic year.

RESIDENCE	TOTAL	Residence Fees PREPAID DEPOSIT	MINIMUM PAYABLE AT REGISTRATION	BALANCE JAN. 20 (INCLUDES \$5 SERVICE CHARGE)
RESIDENCE	TOTAL		·公司部署, 19, 03, 20, 20, 20, 20, 20, 20, 20, 20, 20, 20	
Single Room and Board (Men)	\$1545.00	\$50.00	\$800.00	\$750.00
Single Room and Board (Women)	\$1545.00	\$50.00	\$800.00	\$750.00
Suite Room and Board (Women)	\$1620.00	\$50.00	\$800.00	\$825.00
Double Room and Board (Men)	\$1470.00	\$50.00	\$800.00	\$675.00
Double Room and Board (Women)	\$1470.00	\$50.00	\$800.00	\$675.00

A complete session is defined for students registered in the faculty of Arts and Science as being from the first day of regular registration to the day following the last regularly scheduled examination in the Faculty of Arts and Science (for students in this Faculty). 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 permission of the Dean 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.

The room deposit will be refunded only when notice of cancellation of accommodation has been received by the Registrar or the Dean before August 15.

### Surcharges

If deposit is not paid within 21 days of registration day a surcharge of 11 1 / 2% will be charged. The same applies to charges payable by non-resident students.

Second Term residence fees are due in January and sur charge as above will be levied after February 15.

### **Caution Deposit**

On enrolment each resident student is required to make a deposit of \$25.00 as caution money to cover damage done to furniture, etc. This amount, less deductions, w remain a credit on the books until the student graduate or leaves, when the balance will be returned by cheque usually during June. No refund in whole or in part will be made before that month. All students in residence an held responsible for the care of furnishings within the respective rooms. Losses or damages incurred durin the session will be charged at the caution deposit.

Each year a student, on returning, is expected to set for the previous year's deductions so that his credit ma be maintained at \$25.00.

The items above, together with a key deposit of \$5 and gown rental of \$15.00 (Gowns for non-reside students are optional.) are payable at King's Busine Office.

# **King's College** Residences

Dean of Residence Mrs Pearl Connelly, B.A., B.Ed.

# Dons (1976-77)

Mr. Peter Bryson Mr. Gary MacLean Prof. W. J. Hankey Mr Avard Bishop Miss Sandie Myers Miss Michelle Martinello Miss Catherine MacNeil Nurse Miss Regina Lannon

Residence life at the University is encouraged for all students because the community life there enjoyed forms an essential part of the student's education Exceptions will be made in the case of a student wishing to reside in a home of lodging outside the university.

All students at King's College are normally guaranteed residence accommodation should they with it, on completion of the form for application for accommodation, and subject to the approval of the application by the Dean of Residence.

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. Coin-operated 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 their senior year.

The residences have been designed to provide for the comfort and convenience of the students, and the facilitate study. In the men's residence, two students occupy a suite of two rooms.

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 library, laundry room, 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 residence with first floor for male students and second and third floors for female students was designed to equalize male-female accommodation space and is open to second and third year 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 re-

main for the whole academic session. No student may withdraw from residence without permission from the Dean. Students withdrawing from residences are reauired to give one month's notice in writing to the Dean. A penalty of \$50.00 will be imposed for failure to do this. No refund will be made to any resident who is dismissed for misconduct. Discretionary power in exceptional circumstances remains with the Dean

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 students from 2 p.m. September 13, 1977 and for returning students September 14, 1977, until December 20, 1977 and from the evening of January 2, 1978 to the morning after the last day of exams in the faculty of Arts and Science. Students in their graduating year are permitted to remain in residence until the morning of May 11, 1978. Resident students in faculties whose terms exceed these periods may reside in the College by permission of the Dean on payment of rent. When Prince Hall is open, meals may be purchased.

Except under unusual circumstances and with the permission of the Dean, 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 \$50.00 residence deposit has been received by the Business Office. Deposits for all applications made prior to July 15th must be received by that date. Applications for residence accommodation made after July 15 must be accompanied by the \$50.00 deposit. Cancellation of application received by the Registrar or the Dean prior to August 15th will entitle the student to a refund of the \$50.00 deposit. Failure to cancel with the Registrar before August 15 will result in forfeiture of the \$50.00 deposit.

### **Day Student Hostels**

Limited overnight accommodation is available for King's Day Students in the form of small 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 served basis for a nominal per diem charge. Lockers may be rented for the safe storage of personal effects. By providing limited overnight accommodation Day Students will be able more comfortably to utilize 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. Further details on the operation of these "hostels" will be mailed to each day student early in the fall term.

# **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 1964, 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 and the Campus Police.

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

The object of this association is the organization and promotion of women's athletics at the College. Women's Varsity teams complete in the Women's Division of the Nova Scotia College Conference, as well as having tournament playing privileges in the Junior Varsity section of the Atlantic Universities' Athletic Association. Field hockey, volleyball and basketball are played at the Intercollegiate level and the Women's Basketball team competes in the Metro Ladies' Recreational Basketball Association as well. A co-ed badminton club plays two nights per week and the women's Inter Residence sports league plays once per week. Table tennis is played in the women's residence and the swimming pool is available for student swimming daily.

# King's College Men's Athletic Association

The object of this association is the organization and promotion of men's athletics at the College. The Men's Athletic Association is a full member of the N.S. College Conference and competes at a Varsity Level in soccer, basketball, hockey and volleyball. In addition, the College basketball team is a member of the Halifax-Dartmouth Amateur Basketball Association and competes in the Intermediate League. There is also strong inter bay (inter residence) competition in softball, volleyball, hockey, basketball and road racing. In addition, table tennis, chess and co-ed badminton are played. The gymnasium also has available for personal use a swimming pool, weight room and regulation size gymnasium.

# King's College Dramatic and Choral Society

This society was founded in 1931 to further interest in dramatic and choral work. The programme of the society might include, for example, an evening of one-act plays during the first term, and a three-act play. In addition, the society sponsors an inter-bay play evening and enters a play in the Connolly Shield Competition.

The Dalhousie Drama Workshop, a branch of the Depart ment of English, offers training in voice production, act ing, dance, movement, make-up, costume, set design and construction; and lighting under the direction of experienced instructors. King's students are invited in 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 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 oldes surviving debating association in British North America The activities of the organization include an annu crossing of swords with the gallants of the King's Alun ni Association, even more regular drubbings of th Dalhousie Debating Union, and, by the grace t Students' Union financing, participation in tournamen at Upper Canadian and American colleges and unive sities. The Quintilian annually hosts the Nova Scotia Pr vincial High Schools Debating Tournament. Finally, t Society sponsors the celebrated King's Debate serie which provides a sought after platform for public figure to debate issues of the day.

### The Haliburton

The Haliburton was founded and incorporated by Act Legislature in 1884, and is the oldest literary society of The R. L. Nixon Award. This award is given annually to vation of a Canadian Literature and the collecting fellows, contributes most to residence life in King's. Canadian books, manuscripts, as well as books bea on Canadian History and Literature. College stude The Margaret J. Marriner Award. This award is the students.

# The Ancient Commoner

The "Ancient Commoner" is the students newspaper found woman athlete

# The Students' Missionary Society

This society was founded in 1890. Its object is to pro-This society in missionary work and to further the gospel of Christ especially in the Maritime Provinces, and particularly on the University campus. The annual and particularly 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.

### Awards

The Student Body of the University of King's College awards an overall "K" to participants in King's activities. Inder 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, made possible by a generous donation from the parents of the late Sandra MacLeod, may be given to either a male or emale student. The award is made to a student with a good scholastic record, whose qualities of character are imilar to those which exemplified Sandra's life; a keen ppreciation of life itself and a determination to live life the full, despite adversity, disability or handicap. The ward may be given to a student in any year of his or her legree, but will be given only if there is a deserving reciient. The award is made at the annual Alumni dinner in

college campus in North America. Its object is the cullecting the resident male student who, in the opinion of his

on Canadian History and Elleration of the metro area meet to list women's counterpart of the R.L. Nixon award. It is and interested residents of the matrix figures and by presented to the woman who contributes the most to the e at King's.

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

> he H. L. Puxley Award. Awarded annually to the best all-

Team.

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

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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



# 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

# I. ENTRANCE AWARDS

A. Annual scholarships to the value of \$500, \$800 and \$1000 respectively, provided from various bequests to the university as well as from university funds.

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

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

Alumni Association Funds to provide for one scholarship at \$1000, one at \$750 and two at \$400, of which one is to be awarded to a student from King's College School, Rothesay Collegiate, Edgehill, Netherwood, or Halifax Ladies College.

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.

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-\$600 a Year. Established by Dr. Donald R. Towers, an alumnus of King's, in memory of his mother and father. This bursa tenable for four years, is open to a student of academic standing entering the University to study A and Science and who is a resident, or a descendant residents, of Charlotte County, New Brunswick. Faili any qualified applicants from this county in any o year, the bursary for that year only will become availant to a student resident anywhere outside the Maritin Provinces of Canada. The holder must live in residence

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

serving in the Royal Canadian Navy or retired from Bursaries R.C.N. on pension. Academic achievement and prom will be the first consideration in selecting a candida Nova Scotia Teachers College Bursary - \$500. Awarded will make good use of higher education to benefit note time student in the Faculty of Arts and Science. ly himself but also his country.

course at King's College provided that he makes acce by the late Lena Ruth Deihl. able progress. The Bursary will be withdrawn in event of academic failure or withdrawal from King's [ I.O.D.E. Bursaries, value \$100 to \$200. Awarded to enterlege for any reason.

ly by Friends of New York State Corporation, to a cor Halifax, N.S. B3K 4T6. nuing student who is a citizen of the United States, a Applications open March 1, close May 1. who in the judgment of the Directors of the Corporat

States and Canada.

In any year the scholarship may be divited among tw more students.

Limited offers annually free tuition and or student in need of financial assistance. compulsory fees to all children or wards of employ

and annuitants who proceed to higher educa courses. The awards are tenable for a maximum of years, or the equivalent, at the undergraduate AWARDS bachelor degree level.

Further information and application forms may b tained from The Secretary, Committee on Higher Ed A. Annual scholarships of \$1000, \$800 and \$500 tion, Imperial Oil Limited, 111 St. Clair Avenue W Toronto 7, Ontario.

# C. Professional Scholarships

Doctor of Medicine at Dalhousie University.

renewable yearly provided that the student mainta first class average, and lives in residence each year the regulations of Dalhousie Medical School reu otherwise.

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

charles Frederick William Moseley Scholarship - \$750 charles Established by the will of Charles Frederick william Moseley, this scholarship is open to a student regions No. 16 and No: 17 of the Anglican Diocese of Nova Scotia (To be eligible a student must have residof Nova areas for at least one year while attending High ed in 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 nighest competitor from the regions as an entrance scholarship for one year only.

Applicants must be children of officers and men eith D. Restricted and Regional Scholarships and

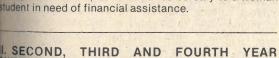
Purpose, industry, and character are to be carefu on the recommendations of the Principal to a graduate weighed, together with the likelihood that the candide of Nova Scotia Teachers College who registers as a full

Deihl Bridgewater Bursary - \$250. To assist needy The Bursary is awarded annually but it is intended to students of suitable standing, resident in the town of tenable by the same student to the completion of Bridgewater, or within six miles of the town. Bequeathed

ing students who show academic ability and financial need. Address applications to Provincial Education The United States Scholarship - \$500. Awarded ann, Secretary, Provincial Chapter, I.O.D.E., 2037 Parker St.,

who in the judgment of the Directors of the corporation The Halifax Rifles Centenary Scholarship - \$200. good relationships between the people of the Un Established by the Halifax Rifles as an entrance scholarhip. For particulars apply to the Registrar.

Lois Hudson Bursary - \$150. Established by a bequest rom the estate of David W. Hudson in memory of his Imperial Oil Higher Education Awards. Imperial sister, Lois Hudson, as an entrance bursary to a woman



respectively, provided by the bequests listed on age 34 and from university funds.

**Restricted Scholarships:** 

Dr. W. Bruce Almon Scholarship — \$1500 a y<sup>The</sup> Honorable Ray Lawson Scholarships — \$600 and Established by the will of Susanna Weston Arrow Alm <sup>5400</sup>. Established through the generosity of the Hon. this scholarship is open to a student entering the Um <sup>Ray</sup> Lawson, Chancellor of the University 1948-56, two sity of King's College and proceeding to the degree Scholarships of \$600, and two of \$400, are awarded to protect of Medicine at Dalhousie University. Insudents entering their second year.

he Stevenson Scholarship - \$120. Founded by the ev. J. Stevenson, M.A., (sometime Professor of Mathematics), this scholarship of \$120 tenable for 2 ars will be awarded to a student with the highest erage on the five best subjects in the first year exinations

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.

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.

assistance.

Alexandra Society Scholarship - \$300. 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.

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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 Maior or English Honours student preferred.

### 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.

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

# 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 10.

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 nually by a friend in memory of Harry Crawford, se Thomas H, and Elizabeth A. Crawford, Gagetown, N. student of this College, who died true to his King and Country, April 14, 1915, while serving in the Canar Motor Cycle Corps.

The prize is awarded to the student completing the ond year Arts course, of good character and acada standing, who in the opinion of the Faculty deserve most.

# III. GRADUATE SCHOLARSHIPS, MEDALS A PRIZES

The Governor General's Medal. Awarded to the tion for the B.A. or B.Sc. Degree. Preference will be g to an Honours Student.

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

The Rhodes Scholarship. This scholarship is of the nual value of 750 pounds sterling. Before applying to Secretary of the Committee of selection for the Prov (which application must be made by November 1) sult the Registrar, King's College.

# Rhodes Scholars who have attended the University 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 I
- 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
- John Roderick Ennes Smith, B.Sc., '38 1938
- 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

to the Registrar.

The Canadian Federation of University W the Registrar.

The Imperial Order Daughters of the Empire Post-The Imperiate Scholarships — \$5000 (for study overseas) and Graduate Scholarships — \$5000 (for study overseas) and Graduate Study in Canada). For information apply to the Registrar.

Imperial Oil Graduate Research Fellowship \$3000 for Imperial Structure information apply to the Registrar.

Commonwealth Scholarships. Under a Plan drawn up at a conference held in Oxford in 1959, each participating a conference the Commonwealth offers a number of scholarships to students of other Commonwealth countries. These scholarships are mainly for graduate study and are tenable in the country making the offer. Awards are normally for two years and cover travelling, tuition rees, other university fees, and living allowance. For didate who obtains the highest standing in the examined to the Great and the awards offered by the various countries Universities Foundation, 75 Albert Street, Ottawa.

> Botary Foundation Fellowship. Open to graduate students for advanced study abroad. Available every second academic year, 1977, 1979, etc. Applications must be considered before August 1st of previous year. Information may be obtained from Rotary Clubs or the Registrar.

# Divinity

scholarships in Divinity are tenable at the Atlantic school of Theology (or elsewhere in the case of paricular 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. stablished by Mr. and Mrs. D.M. Owen, in memory of 1916 The Rev. Cuthbert Aikman Simpson, B.A., the Owen family, tenable for one year, but renewable. and open to applicants who are Nova Scotia born, and esident therein, and are or are about to become heological students preference being given (1) to native esidents of the town of Lunenburg, and (2) to native esidents of the County of Lunenburg.

1946 Nordau Roslyn Goodman, B.Sc., '40, M.Sc., '46 Canon W. S. H. Morris Scholarship - \$1,500. This cholarship 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 ears

e Scholarship may be awarded annually by the Presint and Divinity Faculty to the most deserving member University Women's Club Scholarship — \$500. of the present or recent graduating class of the Divinity University Women's Club of Halifax offers a schola school, who has been at King's at least two years, and of the value of \$500 every second year, 1976-1978, et who, in the opinion of the Faculty, would benefit from a woman graduate of Dalhousie University of King's lavel and/or study in Britain, the U.S.A. or some other lege, to assist her in obtaining her M.A. or M.Sc. de area outside the Atlantic Provinces of Canada, provided at any recognized graduate school. For particulars the reaches a satisfactory standard. Applications, stating use which the applicant expects to make of the holarship, must be submitted to the Divinity Secretary or before January 8, of the year in which the appli-Fellowships — \$1500 to \$2500: For information ap Cant, if successful, intends to use the scholarship. The pient will be required to serve in the Atlantic Provres for a minimum of three years after his return from

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.

Testaments, and 1953

The Daniel Hodoson Scholarship - \$240. Founded in 1883 by Edward J. Hodoson 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 15th, and must not be over 24 years of age at that time. They must also satisfy the Diocesan 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.

or in part.

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 Cooswell 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

This examination will consist of two papers:

- a. A paper on the content of the Old and New
- b. A paper on A.H. McNeile's Introduction to the New Testament (revised edition by C.S.C. Williams) Oxford.

Awards will not be made every year.

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

### 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 1st 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 the 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. approx.). 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 been established in memory of Margaret Draper Gan by her son. Rev. A. E. Gabriel, M.A., an alumnus King's, the yield from which is to be used to give fin cial aid to a Nova Scotian Divinity Student in prepara for the Ministry of the Church. The recipient must nominated or recommended by the Bishop of Scotia. If in any year there is no candidate for assistance the yearly yield is to be used to augment fund. Should King's College Divinity School cease to ist as such, the fund is to be transferred to the Din of Nova Scotia and the income used as aforesaid.

The Reverend Canon H. Douglas Smith Bursary Fun fund of \$4,000 has been established by Mrs. Ethel Smith in memory of her son and King's graduate Reverend Canon H. Douglas Smith. The income of fund is disbursed in the form of bursaries (one or n to needy and deserving persons from the Dioces Nova Scotia or the Diocese of Fredericton who theological students at the Atlantic School of Theol and who intend to enter the ministry in one of Dioceses.

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

memory of John Clark Wilson. Two bursaries of mendation from the Professor of Pastoralia. each, tenable for one year. Awarded to Divinity stur deemed worthy of financial help.

ward Island, preference being given to Divinity stude had from the Registrar.

before May 31st.

hibition of \$50 a year for two years is awarded even years to the student entering the second year prep for Holy Order, whose scholarship and exemplar duct shall, in the opinion of the Faculty, merit it award 1979).

The George Sherman Richards Proficiency Prize -In Memory of the Reverend Robert Norwood, D.D. come from a fund of \$2,000 to be awarded annu the Divinity student who gains the highest aggre marks at the end of his penditinate year, in Theolog Canadian West, that year he takes the regular full course in Theolog Canadian West.

The Countess de Catanzaro Exhibition - \$100. come from a fund of \$2,000 to be awarded by the P 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 dift of the Reverend George McCawley, D.D., in the ands 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 secand prize, to be awarded to the student standing highest n first year Hebrew.

Archdeacon Forsyth Prize - \$50. The Ven. Archdeacon n 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 John Clark Wilson Memorial Bursaries - \$100 a Allan P. Shatford, C.B.E., D.C.L. Awarded annually for Established in 1947 by Miss Catherine R. Kaise Pastoral Theology. The winner must receive a recom-

Laurie Memorial Scholarship. One or more scholarships of about \$250 each, founded in memory of Lieut. Gen. Glebe Scholarship. A scholarship of approximately: Laurie, C.B., D.C.L., open to candidates for the Ministry. is offered annually to Anglican students of Prince under the direction of the Trustees. Particulars may be

Application, accompanied by a certificate of char The Wiswell Trust Divinity Studentship - \$120. A. B. from the applicant's Rector, must be sent to Canada Wiswell, D.C.L., Hon. Fell. (Vind.) of Halifax. N.S., in manent Trust Company, Charlottetown, P.E.I. or 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 Moody Exhibition — \$100. The "Catherine L. Moody to assist Divinity students who were born in Nova Scotia and who propose entering the ministry of the Anglican Church in Canada.

> rince Prize in Apologetics - \$60. Established by a belest of the late Dr. S.H. Prince. Awarded every alternate year, at the discretion of the Faculty. (Next award 979-80)

iswell Missionary Bursary - \$200. Founded by Dr. A. the Divinity student who gains the highest age at 8. Wiswell for help to a Divinity student who believes he marks at the end of his penultimate year, provided the accurate the second state of his penultimate year. as a call to the Mission Field either Overseas or in the

eference will be given to a student who has given procome from a fund of \$2,000 to be awarded by the time of the needed qualities and has taken his degree or to a Divinity student during his second year in construction within a second year in construction of the needed qualities and has taken his degree or to a Divinity student during his second year in the swithin a year of completing his Arts course. If there is The award will be made on the basis of character no student meeting the above requirements the award be left to the discretion of the Divinity Faculty.

> ara E. Hyson Prize - \$5.00. Founded by Miss Clara E. vson and awarded each year on vote of the Faculty.

the year 1977-78.

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 arounds 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.

The King's Divinity Scholarship - \$150. The Anglican Church Women in the Diocese of Nova Scotia makes an annual grant of \$150 towards the expenses of Divinity students who agree to work in the Diocese of Nova Scotia after ordination.

Archbishop Kingston Memorial - \$100. Awarded annually by the Nova Scotia Diocesan A.C.W. on recommendation of the Divinity Faculty, to a needy divinity student

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 1st.

Agnes W. Randall Bursary. Two bursaries of \$8.00 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 \$10.00 each year. Award to be at the discretion of the President.

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 1979-80.

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.

A. Stanley Walker Bursary - \$200. Awarded by the Alexandra Society of King's College. To be given to an Anglican student at the Atlantic School of Theology for

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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.

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

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 1st 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 finalyear who passes the best examination on the exegesis of the Greek test 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 degraying 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 the 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 Bursan \$100. This bursary, the gift of the Parish of Gran N.S., is established in memory of Reverend W. E. Jef son, D.Eng., an alumnus of King's and a grad engineer, who was ordained late in life and yet was a to give nearly twenty years of devoted service to the dained ministry. Preference will be given to older pursuing post-graduate studies or to older men preing for ordination. The award is to be made by the Di ty Faculty.

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

St. Paul's Garrison Chapel Memorial Prize - \$20. To awarded to the Divinity student chosen by the Facult attend a Christmas Conference.

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

Northumbria Region Bursary - \$150. Offered annu by the Brotherhood of Anglican Churchmen in the No umbria Region.

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

# Canada Student Loans

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

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

# **Societies Connected** With The College

# Alumni Association of King's College

This Association, incorporated in 1847 by Ac Legislature, consists of graduates and other who Legislature, consists of graduates and other with ject is the furtherance of the welfare of the Univers<sup>th</sup> <sup>Recording Secretary,</sup> <sup>Mrs.</sup> H. B. Wainwright, 9-1-7, SS No. 2, Armdale, N.S.

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

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

The Officers of the Association in 1976-77: President. Ms. Mary L. Barker 1149, Wellington Street Halifax, N.S. **B3H 3A2** 

vice-President. Mr C. Wm. Hayward 918. Robie Street Halifax, N.S. B3H 3C4

Treasurer. Mr. James S. Jardine 1055 Lucknow St. Apt. 408 Halifax, N.S.

**Executive Secretary.** Mrs. Iris Newman University of Kina's College Halifax, N.S. B3H 2A1

### The Alexandra Society of King's College

This Society, which has branches all over the Maritime Povinces, was formed in Halifax in 1902 as the Women's Auxiliary to the College. It maintains an annual scholarship and bursary and supports the Alexandra Special Lecturer in Pastoralia (Director of Parish Field Work).

### **Officers 1976-77**

Hon. President. Mrs. G. F. Arnold

Hon, Vice-President, Mrs. H. L. Nutter

## Immediate Past President.

Mrs. A. G. MacIntosh, 12 Westwood Drive, Truro, N.S.

President

Mrs. P. N. McIvor, 8 Lakeview Point, Dartmouth, N.S.

### Vice-Presidents,

- Mrs. J. E. Lane, Apt. 34, 6411 South Street, Halifax, N.S. B3H 1V1
- Mrs. A. MacKeigan, 68 Reserve St., Glace Bay, N.S.
- Mrs. E. R. McCordick, Apt. 5, 1222 Regent St., Fredericton, N.B. E3B 3Z4

Corresponding Secretary. Mrs. V. Fairn, 55 Lynn Drive, Dartmouth, N.S.

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

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# **Convocation 1976**

# **Graduating Class**

# Life Officers

Honorary President The Reverend Robert Petite

President Adrienne Mary Malloy

Vice-President John David Gerard Farrell

Secretary Joanne Catherine MacLean

Treasurer Mary Kathleen Lewis

Miss Christy Ann Wentworth Lomas Valedictorian

Doctor of Civil Law (honoris causa) Robert William Begg, Saskatoon, Sask. Allison DeForest Pickett, Deep Brook, N.S.

# **Bachelor of Arts Degree:**

- \* Adam, Michael James Blackwood, Dartmouth, N.S.
- \*\* Angus, David Edward, Halifax, N.S. Bain, Crystal Dawn, Halifax, N.S. Brown, Doyle Hessler (Honours in Philosophy, History, Economics and Classics), Reno, Nevada Bryson, Peter Martin Stewart (Distinction), Halifax,
- \* Cameron, Barbara Jean, Dartmouth, N.S.
- \* Corbin, Kenneth Earl, Halifax, N.S. Courage, Rosalie Ann, Sydney, N.S. Crowe, Myra Jane, Stewiacke, N.S. Dawson, Thelma Marie, Sydney, N.S. Delorey, Kerry Calvin John, Gold River, N.S. Doull, John William, Halifax, N.S. \* Dow, Alistair Charles Stuart, Sydney Forks, N.S.
- Farrell, John David Gerard, New Glasgow, N.S. Gailey, Lorraine Virginia Wade, Halifax, N.S. Henderson, Geoffrey Kent (First Class Honours in English), Doaktown, N.B. Hill, Deborah Ardith, Halifax, N.S.
- \* Horner, Dawn Daneen, Halifax, N.S.
- \*\* Kirby, William John Torrance (Distinction), Calgary, Alberta
  - Krol, Dawn Linda, Dartmouth, N.S. Lane, Elizabeth Anne, Lunenburg, N.S. Lomas, Christy Ann Wentworth, Halifax, N.S.
- \* MacLean, Dorothy Joan, Sydney, N.S. MacLean, Joanne Catherine, Sydney, N.S. MacNeil, Elizabeth Christina, Westmount, N.S. Malloy, Adrienne Mary, Sydney, N.S.
- \*\* McArel, Catherine Campbell (Distinction), Halifax,
- \*\* McColm, Anne Rhea, Black Cape, P.Q.
- Osborne, Karen Elizabeth, West Lawrencetown, N.S. \*\* Retson, Robert John, Truro, N.S.
- \* Roach, Patrick John, New Waterford, N.S. \* Roby, Nancy Ann, Windsor, N.S.

- \*\* Secord, David John, B.Sc., Shediac, N.B.
- \*\* Smith: Colin, Halifax, N.S. Smith, Linda Coleen, Dartmouth, N.S. Smith, Ruth Elizabeth Newman, Athol, N.S. Strople, Geoffrey Thomas (First Class Honours in Sociology), Sackville, N.S. Webber, Grant Adelbert, Sydney, N.S. York, Margaret Irene, Oromocto, N.B.

# Bachelor of Science Degree:

- \*\* Bourbeau, Marguerite, Granby, P.Q. \*\* Duggan, Gary William, Bayside, N.S.
- \*\* Evans, Alison Jane, Waverley, N.S.
- Lewis, Mary Kathleen, Montreal, P.Q. Lewis, Nancy Irene, New Waterford, N.S. Lockyer, Robert Douglas, Dartmouth, N.S. \*\* MacKay, Clive Hugh Reginald, West Royalty, P.E.I.
- Northover, Deborah Gail, Petite Riviere, N.S. \*\* Sperry, John MacDonald, Petite Riviere, N.S.
- Strum, Eileen Agnes, Dartmouth, N.S. Walker, Stephen David, Bedford, N.S. Wavrock, Paul Leslie, Oxford, N.S.

\*\* Secord, David John, B.Sc., (Honours in Mathematics), Honours Certificate:

- Shediac, N.B.
- \* Conferred during the session
- \*\* In absentia

# Encaenia Awards

# Arts and Science

The Governor General's Medal, Geoffrey Strople The Beatrice E. Fry Memorial Prize, Ardith Adams The Almon-Welsford Testimonial Prize, Philippa Camp

The Harry Crawford Memorial Prize, Stephen Kent

The Lawson Prize, Thomas Stephen

Dr. M.A.B. Smith Prize, Barbara Tilley

The Bishop Binney Prize, Barbara Tilley The Zaidee Horsfall Prize in Mathematics, Jane Tówn

The McCawley Classical Prize, Margaret vonMaltzhan

The Canon W. S. H. Morris Scholarship, The Reverent Keith Hamlin, David Staples

The George Sherman Richards Proficiency Prize, Ronal

The Archdeacon Forsythe Prize, Frederick Hiltz The Shatford Pastoral Thelogy Prize, The Reveren

The Kenelm Eaton Memorial Scholarship, Charle

The Canadian Bible Society Book for the Reading of I

Holy Scripture, George Taylor The George M. Ambrose Proficiency Prize, Kenne Vaughan, Roderick Gillis

The Dr. C. Pennyman Worsley Prize, Barry Thorley The H. Terry Creighton Scholarship, The Reverend Ke

The Prince Prize in Apologetics, Andrew Wetmore The Junior McCawley Hebrew Prize, The Reverend Ke Hamlin

# Entrance Scholarships and Bursaries Awarded May, 1976 (Arts and Science)

Laurin Armstrong Susan Bungay (Susanna Almon) Patricia Chalmers (Alumni) Leonard Collier Stephen Crowther (Susanna Almon) Alison Gill (Henry S. Cousins) Jennifer Henderson Kevin Henderson Bernard Hibbitts (Alumni) Flizabeth Ingraham (Susanna Almon) Colleen Ireland Brian Kelly (Dr. Norman H. Gosse) Stuart Lee (Alumni) Ian Llovd

Judith White

Elizabeth MacDonald (Alumni) Douglas MacCov Brenda Morrison Marie Ripley (Henry S. Cousins) John Ruohoniemi (Susanna Almon) Shelley Shea Rhea Skerrett Michael Spaulding Brian Spence (Henry S. Cousins) Roger Strum

Nova Scotia Teachers College Bursary Anne Louise West

**Deihl Bridgewater Bursary** Elizabeth Ingraham

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# arts & science: degree programmes

### nearee Programmes

1 Courses of Study

Rachelor of Arts / Bachelor of Science General Honours

# 2. Subject Grouping

A.Languages French German Greek Latin Russian Spanish

**B. Humanities** Classics **Comparative Literature** English History Mediaeval Studies Music Philosophy Religion Theatre

**D. Sciences** 

Biology

Chemistry

Geology

**Physics** 

**Biochemistry** 

Mathematics

### **C. Social Sciences** Anthropology

**Economics Political Science** Psychology Sociology

Classes are offered also in other subjects: Architecture, Art History, Computer Science, Education, Engineering, Oceanography and Humanistic Studies in Science.

## 3. Numbering of Classes

The Faculty is in the process of reviewing its system of numbering classes. Most classes are numbered with a three digit number; others, however, are numbered with a four digit number. The following general criteria apply to both kinds of numbering. Students are urged to consult the relevant departments if they are confused by any specific numbering system.

Classes are numbered to indicate their general level and the year of study in which they may first be taken. The first digit in either a three or four digit number normally indicates the year of study. Thus, classes in the 100 + series are introductory and can normally be taken by fully matriculated students without any special prerequisites. Completion of a 100-level class is normally a prerequisite for admission to further classes in the subject. Classes in the 200 + series, 300 +, series and 400 + series are normally taken in the second, third and fourth years respectively.

## Certain classes in the 200, 300, or 400 series are restricted to Honours students and may not be laken by students in the General Degree programmes, except with special permission of the instructor.

class.

# 4.3 Prospective Teachers

Students considering teaching as a profession should before registering consult the Chairman of the Department of Education regarding their programme of study. Those considering music teaching should consult the Chairman 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 by the student will constitute his/

# NOTE

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The following pages containing information about the Degrees of Bachelor of Arts and Bachelor of Science are reprinted, with permission, from the Calendar of Dalhousie University. Students enrolled at King's College in Arts and Science are admitted to the same programmes and classes as students enrolled at Dalhousie University (see p. 9), with the exception of King's College students enrolled in the Foundation Year Programme (see p. 21).

Classes in the 500 + and 600 + series are normally regarded as graduate classes; however, some may be open to senior undergraduates with the permission of the department or instructor concerned

The Letters A and B denote classes given in the fall and winter terms respectively. The symbol A/B indicates a class given in the first term and repeated in the second term. The letters C and R denote classes spread over both terms, i.e., given in the regular academic year. An R class carries one full credit or more, and a C class less than one full credit. The letters S and T denote classes given in the first and second summer session respectively, regardless of the credit value of the

Classes with numbers below 100 do not carry credits but may be prerequisites for entry to credit classes for students whose matriculation backgrounds are deficient.

## 4. Programme Advice

### **4.1 Entering Students**

Any student who wishes to declare his major at initial registration must consult with the department concerned regarding his 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

Every student entering the second year is assigned a Faculty advisor with whom he must consult regarding his programme. Normally the department concerned assigns an advisor to a student once he has declared his major subject. Students seeking to enter an Individual Programme (section 5.2.3 below) or an Unconcentrated Honours Programme (section 5.3.5.2 below) must approach the Chairman of the Programme Advisory Committee which will assign an advisor or advisors and which must give approval to programmes of these types.

# 46 arts & science: degree programmes

her first year of study, the second five classes his/her 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 a B.Sc., and paragraph 5.2 applies to the next ten classes of such a student.

# 5. Bachelor of Arts/Bachelor of Science

General: three years—15 classes required<sup>1</sup> Honours: four years—20 classes required

For the degree of B.Sc.: All students entering for the first time in September 1976 and subsequent years are required to have at least one full university class in mathematics.

# 5.1 The First Year

5.1.1 Requirements (a) Each full-time student planning to take a B.A. or a B.Sc. will in the first year normally take five classes or the equivalent, 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) No student may in his first year take for credit more than the equivalent of two full-credit classes in a single department.

(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 listed in the Programme Planning Guide.

# <sup>1</sup> Application of Regulations to students who entered in 1972 or earlier.

All students who entered a General B.A. or General B.Sc. degree programme prior to 1973 must meet the requirements as outlined in Sections 5.2 and 5.1.1(a) above; if beyond the first year they will be considered to have been in an Ordinary Programme.

# 5.1.2 Recommendations

These recommendations do not apply to students entering the King's Foundation Year Programme.

(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.

# 5.1.3 Special Options

(a) A first-year student may (but need not) declare his intended major department and may be ac-

cepted by the chosen department at initial registration. Such a student must consult with the department concerned regarding his 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 the student 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 General B.A. and B.Sc. - Requirements for the Second and Third Years

A student who has successfully completed the first year may pursue a programme toward a general degree or - if qualified - enter an honours programme. (Honours programmes are outlined in section 5.3 below.) In the second and third years, three types of options are open to the candidate for a General B.A. or General B.Sc.:

(a) Ordinary Programmes, which may be pursued in any department in which it is possible to obtain a General B.A. or B.Sc. In such a programme, the student must select a major subject, 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 op tions.

The rules governing each of these options are outlined below.

# 5.2.1 Ordinary Programmes (B.A./B.Sc. General)

5.2.1.1 The ten classes making up the course for the second and third years must meet the follow ing requirements:

(a) at least seven classes shall be beyond the 10. level;

three subjects:

(c) (i) at least four and no more than eight classe beyond the 100 level shall be in a single area concentration (the major). (ii) up to two of the

# arts & science: degree programmes

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.

521.2 On registration in his second year the student must declare his major and have it approved by the department concerned.

52.1.3 For the B.A., the major may be chosen from French, German, Greek, Latin, Russian, Spanish classics, English, history, philosophy, music, anthropology, economics, political science. sociology, or from any of the B.Sc. subjects except engineering.

52.1.4 For the B.Sc. the major subject must be chosen from biology, chemistry, engineering, neology, mathematics, physics, or psychology,

5.2.1.5 Students may choose electives from any of the classes listed in the Arts and Science Calendar, subject to the following restrictions:

(a) Selections in Education are limited to a maximum of three classes from the Education Foundation Offerings (Education classes with numbers below 4500).

(b) Students enrolling in electives are required to meet all normal class pre-requisities.

Note: Students are also permitted to take up to three electives from the Commerce offerings of the School of Business Administration. This regulation is currently under review.

### 5.2.2 Co-ordinated Programmes (B.A./B.Sc. General)

A student may in his 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 coordinated programmes may structure them as it wishes, consistent with sound academic practice and subject to the following guidelines:

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

(b) that the function of each programme form part (b) at least one class shall be in each of at leas of the Calendar description of each programme;

(c) that each two-year programme permit the student at least one class of his own choice in each <sup>of</sup> the second and third years;

Able and ambitious students are urged to enter an Honours Programme. These programmes entail a higher quality of work than that required for the general bachelor's degree. There are two types of honours courses: 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 transfer from the honours to the general programme without serious inconvenience. To this end the Honours candidate must include among his first year classes one selected from a list of classes in which written work is considered frequently and in detail. (See 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 will supervise their whole programme of study. Honours students in an unconcentrated programme must be accepted by the Programme Advisory Committee, which will appoint an interdisciplinary advisory committee of two or more Faculty members to supervise the

(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.

5.2.3 Individual Programmes (B.A./B.Sc. General)

A student whose academic needs are not met by the progammes offered under paragraphs 5.2.1 and 5.2.2 may present two one-year or a two-year programme of his own choice to the Programme Advisory Committee for scrutiny and approval; it being understood that the Committee and/or Faculty advisor provide assistance in constructing and revising such programmes.

### 5.2.4 Transfer Between Programmes

A student who transfers at the beginning of his third year from or into an Ordinary Programme must meet the requirements under either paragraphs 5.2.1 or 5.2.3, and may declare a new major subject.

### **5.3 Honours Programmes**

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# programme of study.

# 5.3.2 Application for Admission

Application for admission to an honours course 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 Honours of a General B.A., or B.Sc. Degree

A student who has received a General B.A. or B.Sc. degree from Dalhousie and who is not enrolled in a programme of study in another Faculty, may apply for admission into an Honours B.A., B.Sc. or B.Sc.(Eng. Phys.) programme. Regulations in paragraphs 5.3.1 and 5.3.5 (or the regulations regarding the B.Sc. with Honours in Engineering Physics) must be met. On satisfying the requirements of the Honours degree programme, the student will receive a certificate which converts his General degree to an Honours degree.

# 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 and must be accepted by the major departments concerned at both institutions: These departments will supervise the entire programme of study of accepted applicants. Paragraph 5.3.5.1 applies fully to such joint programmes.

# 5.3.5 Requirements for the Second, Third, and Fourth Years

# 5.3.5.1 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). A student 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 classes 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 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. A student 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 in 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 a student's record 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 will be referred to as the honours supplementary examination.

(d) Departments may elect to use a pass-fail grading system for the honours supplementary examination.

Students must attain an average of B- in the eleven (or more) classes in the two disciplines in which he/she has concentrated; attainment of an average of at least A- in these classes is required to obtain First Class Honours. In departments which do not use a pass-fail grade for the honours supplementary examination, students must attain a grade of not less than B- in the honours supplementary examination; attainment of a grade of at least A- in the honours supplementary examination is required to obtain first class honours.

Details of specific departmental honours programmes will be found under departmental listings of Programmes of Study.

# 5.3.5.2 Unconcentrated Honours Programme

(a) Honours in the unreal requirement that the fifesion to the junior year of the Nova Scotia teen classes beyond the first year of study com Technical College. Students who plan to study prise:

(i) twieve classes beyond the Department more subjects. No more than five of these may be of Engineering and Engineering-Physics on initial in a single subject; no less than six and no more registration. See also Architecture below. 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 required 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 mus be selected from biology, chemistry, geology mathematics, physics, and psychology, and a

# arts & science: degree programmes

least six additional classes must be selected from groups C and D.

(d) At the conclusion of an Unconcentrated (d) At a student's record must show a drade 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 committee or departments supervising the student's program (subject to the approval of the Committee on studies). The method by which this grade is obtained will be referred to as the honours supplementary examination.

(a) Departments may elect to use a pass-fail grading system for the honours supplementary examination.

students must attain an average of B- in the required advanced classes which comprise his honours program; attainment of an average of at least A. in these advanced classes is required to obtain First Class Honours.

In departments which do not use a pass-fail grade or the honours supplementary examination, students must attain a grade of not less than B- in the honours supplementary examination; attainment of a grade of at least A- in the honours supplemenary examination is required to obtain First Class Honours

## 6. Uniform Bachelor of Science for Engineering

Three Years — 16 classes required.

On successful completion of this course, the student receives a General Bachelor of Science (a) Honours in the unconcentrated programmes Degree from Dalhousie and qualifies for admisurther at a college other than the Nova Scotia (i) twieve classes beyond the 100 level in three of Technical College should consult the Department

## **PROGRAMMES OF STUDY** AND CLASSES OFFERED

Professors J.E. Flint (History) D.M. Johnston (Law) K.A Heard (Political Science) Z.A. Konczacki (Economics) R.I. McAllister (Economics) B. Pachai (History) A.M. Sinclair (Economics) J.B. Webster (History: on leave)

Assistant Professors A. Kom (French) T.M. Shaw (Political Science)

The programme in African Studies offers students an opportunity to integrate classes from a number of disciplines. The central focus is Africa. 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 100, English 100, History 199, Political Science 1100 or Sociology 100.

**Associate Professors** J.H. Barkow (Anthropology; sabbatical) E. Gold (Law) P.D. Pillay (History) R.J. Smith (English)

# african studies

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## African Studies

2. In the second and third years at least seven of the ten classes 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.

## African Studies 200 -- Southern Africa Coordinator for 1977-78: T.M. Shaw

This class is intended to provide a detailed study of one region of Africa. It involves many disciplines and is taught by faculty members from the Humanities and Social Sciences. In it, the politics, history, economics and culture of

Southern Africa are studied. The topics discussed include literature, pre- and post- colonial history, social and economic change, political participation and exclusion. The function of the class is to

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introduce students interested in African Studies to one part of the continent using the insights of several disciplines and modes of analysis. The class consists of one two-hour seminar each week. Students will be graded on the basis of attendance and participation in seminars, a final examination and two term papers. There may be a Christmas test. The class consists of approximately four sessions in each of the following topics and disciplines:

1. Novels and Poems from Southern Africa; R.J. Smith (English)

2. The Pre-Colonial Period: Afrikaners and Africans in Southern Africa; (History)

3. Imperial Intrusion and Its Impact on Southern Africa; J.E. Flint and P.D. Pillay (History)

4. Socio-Economic Change in Southern Africa, 1880-1970; Z.A. Konczacki (Economics)

5. Contemporary Politics of Southern Africa; K.A. Heard (Political Science)

6. Southern Africa and the International System; T. M. Shaw (Political Science)

## LISTI

(See respective disciplinary sections of the calendar for class descriptions).

Anthropology 316, Africa: Ethnography and Modernization, J.H. Barkow

Economics 234A, Pre-Colonial Economic History of Sub-Saharan Africa, Z.A. Konczacki

Economics 235B, Economic History of Tropical Africa: Colonial Period, Z.A. Konczacki me stort be hemist Medicine hi

Economics 337B, Recent Economic Developments in Sub-Saharan Africa, Z.A. Konczacki

English 217, African Literature, R.J. Smith (not offered 1977-78)

History 242, Tropical Africa before 1800, J.E. Flint

History 245, Tropical Africa in the Nineteenth and **Twentieth Centuries** 

History 345, History of South Africa, P.D. Pillay

History 349, Studies in Decolonization, J.E. Flint

Political Science 3315A, African Politics, T.M.

### Shaw

Political Science 3345B. South Africa: 1 Dynamics of Political Groups and Group Domin tion, K.A. Heard

Order, T.M. Shaw (not offered 1977-78)

Political Science 3540B, Foreign Policies African States, T.M. Shaw

in Southern Africa, T.M. Shaw (not offere programmes in Arts and Science. 1977-78)

## LISTI

Anthropology 210, Ecology and Culture

Anthropology 226A, Culture and Politic Behaviour, L. Kasdan

Anthropology 320 A & B, Readings in A thropology, Staff

Anthropology 340, Ethnicity and Nationhood, Art History Kasdan

Economics 331A, Economic Development: An E vironmental Approach, Z.A. Konczacki Details not available at time of publication.

Economics 333A, Theories of Economic Develo ment, Z.A. Konczacki

History 213, British Commonwealth and Empire M. Turner and P.D. Pillay

Political Science 2500, World Politics, T.M. Shaw

Political Science 3530, The United Nations World Politics, R. Boardman and M.K. McGw (not offered 1977-78)

Sociology 206, Social Change and Modernization H.V. Gamberg

Sociology 306, Modernization and Developme J.J. Mangalam

**Ancient History** See under Classics

Anthropology See under Sociology and Anthropology.

# architecture = art history

Architecture

# **biochemistry**

# **Biochemistry**

100 Introduction to Architecture, lect./sem.: thr. Prac.: 2 hrs. L. Richards.

Political Science 3535A, Towards a New Work An introductory class showing architecture as a bridge between the Arts and Science that will provide an insight into professional architectural studies. In the first term discussion will centre around some components of architectural design: in the second term, architecture in present day Political Science 3544A, Conflict and Cooperation life. Available as an elective in the general degree

**Classes Offered** 

A.H. Blair

F.I. Maclean C Mezei F.B. Palmer

L.C. Stewart M.W. Grav

J.T.R. Clarke

R.A. Singer

The results of biochemical research are applicable in almost every aspect of life. The agricultural drug, fermentation and food processing industries, to name but a few, rely heavily on biochemical techniques and knowledge. Much of fundamental biology is best understood in biochemical terms, and problems relating to such apparently remote areas as ecology and psychology are being referred, more and more often, to the biochemist. Medicine turns to biochemistry for explanations of hereditary and metabolic disorders and for an understanding of the actions of drugs and is on the threshold of explaining some psychiatric conditions in biochemical terms.

Where are biochemically trained people employed? In Canada, most of them work in universities, in agricultural research, or in government or hospital laboratories; some are employed in industry. Training to the B.Sc. level enables one to work as a technician or research assistant; more responsible positions usually require a higher degree. Graduates in biochemistry can go on to further training in medicine, pharmacology, physiology, and various other branches of the biological sciences.

Professors C.W. Helleiner (Chairman) L.B. Macpherson S.J. Patrick D.W. Russell S.D. Wainwright

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# Associate Professors

W.F. Doolittle J.A. Verpoorte

### Assistant Professors

C.B. Lazier M.W. Spence

# Lecturers H.W. Cook M.S. DeWolfe E.S. MacFarlane

Biochemistry deals with the study of the structure and behaviour of the molecules of living things.

# 52 biochemistry

The Biochemistry Department is located in the Sir Charles Tupper Medical Building. Although administratively the department is in the Faculty of Medicine, it is also an integral part of the Faculty of Arts and Science; its members take an active part in teaching in both faculties, and most of the research work is as relevant to biology in general as to medicine.

# Degree Programmes

The study of biochemistry requires a prior knowledge of elementary biology, mathematics and physics, and a good grounding in organic and physical chemistry. Accordingly, the honours programme in biochemistry is planned in such a way that these subjects are covered in an orderly fashion before students begin the study of biochemistry proper. Students who are not concentrating in biochemistry, but who wish to include a class in biochemistry in their programmes, should plan to do so in their third or fourth year. They should ensure that the necessary background is provided in their earlier years. The outline of the honours programmes will serve as a guide in this respect. It should be noted particularly that a class in organic chemistry is a prerequisite for the elementary class in biochemistry, and that one in physical chemistry is strongly recommended.

# B.Sc. with Honours in Biochemistry

The honours programme in biochemistry aims to provide the student with the background necessary for graduate work in biochemistry and allied fields. It is also a suitable preparation for the study of medicine or dentistry. Because the chemical content of all branches of biology is rapidly increasing, biochemistry can be recommended as a starting point for a career in many fields of biology.

Three major programmes in biochemistry are outlined below, with minors in biology, physics and mathematics. Honours students must pass a comprehensive examination in biochemistry at the conclusion of their period of study.

1. Elective. (See section 5 of the general regulations for Degree Programmes). 2. Mathematics 100 and 101. 3. Chemistry 110. 4. Biology 1000. 5. Physics 110.

Year II 6. Chemistry 231A and 232B. 7. Chemistry 240. 8. Elective (Group D).

9 Flective.

Minor in Biology 10. Biology class.

Minor in Physics 10. Physics 230, 221 or 222.

Minor in Mathematics 10. Mathematics class (beyond 100 level).

### Year III

11. Biochemistry 300. 12. Chemistry 220A and 211B.

13. Additional Chemistry class.

14. Additional class in minor subject.

15 Flective.

### Year IV

16. Two of: Biochemistry 430, 431, 432. 17. Biochemistry 460 and 461B. 18. Biochemistry 470A and 471B. 19. Additional Biochemistry or Chemistry class 20. Elective (Group D).

## Classes Offered

300 Introductory Biochemistry, lect.: 2hrs.; D Russell/S.J. Patrick. Tutorial: 1 hr.; Various s members. Lab. 3 hrs.; C. Mezei/C.B. Lazier.

This class aims to examine the ways in which concepts of chemistry may be used to further understanding of life. About half the year is sp in studying the chemical and biological pro ties of those compounds found universally in ing things - proteins, polysaccharides, li and nucleic acids. The catalytic properties of 403A Metabolism of Carbohydrates and cellular environment, are discussed in s detail.

This study of biochemical form is interwove much as possible with a study of biochemical cess. Intermediary metabolism - the sequer of chemical reactions within living things its biological implications are illustrated with drates. By this means the ways in w organisms obtain, store, and use energy clarified. The dependence of biochemical pro upon other processes within the biosphere is 4318 Topics in Metabolism and Regulation, emplified by brief consideration of the cycli carbon and nitrogen in nature.

chemical aspects of heredity and biological hese will include fermentative pathways, mito-

# hipchemistry

dividuality, and concludes with a short discussion of chemically-mediated control mechanisms as exemplified by the action of selected vertebrate hormones.

A variety of learning aids and experiences - a A valled curricular outline, small-group discusions, laboratory exercises, and lectures - is provided, and considerable effort is made to incorporate all of these into an integrated whole. At the same time students are encouraged to explore one particular biochemical interest in depth by preparing a term paper on a topic of their own choice.

this class, or an equivalent one, is a prerequisite to more advanced classes in biochemistry.

prerequisite: a class in organic chemistry; it will he assumed that students are familiar with the structures and reactions of the major classes of organic compounds. A basic class in physical chemistry is very desirable. The prospective student will be much better prepared for this class if he has some prior knowledge of chemical equilibrium, pH and elementary chemical kinetics.

The following three classes deal principally with intermediary metabolism. They are intended to expand and complement the study of metabolism begun in the introductory class. Also included are a number of more specialized topics of particular interest. Emphasis is placed upon interrelationships between different metabolic systems and. where possible, these systems are examined for mechanisms by which the control and direction of metabolism are achieved. Students are expected to gain an appreciation of the kinds of evidence on which the concepts are based and be prepared to interpret experimental data. The prerequisite is an introductory course in biochemistry.

zymes, and their modulation by alterations in Amino Compounds, lect.: 2 hrs.; M.S. De Wolfe/F.B. Palmer.

opics will include alternative modes of netabolizing carbohydrates, including a discussion of enzyme location, mitochondrial permeability and the utilization of modified oxidative cycles. The biosynthesis of amino acids will be considered with special reference to metabolic its biological implications aductive synthesis control mechanisms. The synthesis of oligo and oxidative degradation of lipids and carb polysaccharides, amino sugars, glycosaminoycans and other cell wall polymers will also be

# <sup>ct.:</sup> 2 hrs.; F.I. Maclean/C.Mezei/C. Lazier.

The class includes an introduction to these yellding systems will be studied in detail.

Prerequisite: A basic class in Biochemistry and permission of instructor.

nate years.

Prerequisite: A basic class in Biochemistry and permission of the instructors.

460A Advanced Instrumentation Techniques, lab.: 6 hrs.; J.A. Verpoorte.

chondrial oxidative phosphorylation and photosynthetic systems. Other major topics will be: the structure and biogenesis of biological membranes, the metabolism and function of neurotransmitters, and an introduction to current concepts of the mechanisms of metabolic regulation by hormones.

432B Biochemistry of Lipids. lect.: 2 hrs.: J.T. Clarke/H. Cook/F.B. Palmer/M.W. Spence.

The chemical and physical nature of insoluble lipids in an aqueous environment will be explored This will include an introduction to current ideas of the physical states of lipids in biological systems and a consideration of the difficulties encountered when insoluble compounds interact with soluble and insoluble enzymes. The metabolism of a variety of lipids will also be studied with particular reference to those for which special physiological functions are known or suspected such as glycolipids, fatty acid derivatives including prostaglandins, sterol derivatives, certain phospholipids, etc.

440 Protein Synthesis and Control Mechanisms, Lecture: 2 hrs.: S.D. Wainwright.

A class dealing with the cell components and reactions involved in the biosynthesis of protein with particular reference to mechanisms which control the rate of protein synthesis and spectrum of proteins made. Emphasis is placed on individual study of research reports. Offered in 1977-78 and alternate years.

442 Nucleic Acids, 2 hrs.; W.F. Doolittle/ M.W. Gray/C.W. Helleiner.

A class dealing with chemical and physical approaches to the structure of nucleic acids and the enzymology of nucleic acid biosynthesis and repair. Emphasis is placed on reading and interpreting recent research reports and solving numerical problems. Offered in 1976-77 and alter-

Instruction is provided for a limited number of advanced students in the use of instrumentation. The principles and operation of the equipment

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will be discussed. The class includes discussion of spectrophotometers, a spectrofluorimeter, atomic absorption spectrophotometer, spectropolarimeter, automatic titration equipment as well as ultracentrifuges.

Prerequisite: Biochemistry 302 or an equivalent class in basic biochemistry.

461B Special Project in Biochemistry, Lab.: 6 hrs.; various staff members.

A small laboratory investigation will be undertaken. The student will be expected to learn the basis of the project in depth and then plan and carry out experiments to answer an appropriate question. The results will be interpreted and a report written in the standard scientific manner.

Prerequisite: Biochemistry 302 or an equivalent class in basic biochemistry.

# 470A Physical Biochemistry, Lect.: 2 hrs.; J.A. Verpoorte

Selected aspects of the chemistry of biological macromolecules, such as proteins. Topics include: discussions of the relationship between structure and biological activity, the stabilizing forces in maintaining structure as well as chemical and physical methods for isolating and studying properties of macromolecules.

Prerequisites: A basic class in biochemistry and in physical chemistry.

471B Enzymes, lect.: 2 hrs.; A.H. Blair / J.A. Verpoorte.

The first part of this class deals in a general way with the binding of small molecules, including hydrogen ions, to proteins. The second part is devoted to a study of the kinetic properties of enzymes and how the binding of various regulatory substances influences kinetic behaviour. Such interactions are important for the control of cellular metabolism. The relationship between the structure of catalytic and regulatory sites and their function will be considered for selected enzymes.

Prerequisite: A basic class in Biochemistry.

# biology Biology

Professors C.M. Boyd (Oceanography) MI Cameron L.M. Dickie (Oceanography) B.K. Hall F.R. Hayes (Killam Senior Fellow) O P Kamra W.C. Kimmins K.E. von Maltzahn K.H. Mann (Chairman) I.A. McLaren E.L. Mills (Oceanography) J.G. Ogden FC Pielou G.A. Riley (Oceanography) L.C. Vining

# **Associate Professors**

F.W. Angelopoulos R G. Brown A.R.O. Chapman R.W. Doyle J. Farley F.B. Goldsmith FT. Garside L.E. Haley M.J. Harvey

# Assistant Professors

M. Brylinsky J.V. Collins G.S. Hicks P.A. Lane RW. Lee R.P. McBride R.K. O'Dor D.G. Patriquin E. Zouros

# **Adjunct Professors**

IS Craigie D.P. Pielou

### Instructors

B. Pollock W. Joyce B. Joyce S. Singh C. Schom W. Bohaychuk S. Silcox A. Hicks J. Wilson T. Mobbs C. Bays C. Coté M.J. O'Halloran F. Tidmarsh

# hiology

v. Girard

M Willison

Research Associates D. Brewer C. Corkett I Kerekes I Kurobane G McLelland G. Newkirk T Platt A. Taylor M Yoon Postdoctoral Fellows E. Byard

The programme offered by the Department gives a hasic training in the biological sciences which may serve as preparation for graduate and professional work in biology, medicine, dentistry, nharmacy, the health professions, bioengineering and education; agriculture, aquaculture, forestry and environmental architecture and engineering.

## Degree Programmes

The Department offers classes leading to the General B.A. and B.Sc. degree in biology and to a concentrated or combined Honours B.Sc. pronramme. A student intending to study biology as his main subject is asked to consult the Department early in his course so that a proper programme can be worked out.

## Honours in Biology and Preparation for Graduate Study.

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 a Bachelor of Science degree with honours in biology must satisfy the general requirements for honours degrees and arrange their course programme as early as possible in consultation with the Department. In the fourth year a programme will normally include Biology 4900.

or some graduate programmes, a combined or inconcentrated honours program may be the best reparation. Advice on this matter may be obtained in the Department.

udents having a special interest in Marine ology are advised to obtain a good dergraduate training in general biology, athematics and physical sciences, and Decialize in marine work in graduate school.

Students wishing to obtain a broad overview of Biology without specialization in any particular area are advised to take as many 2000-level core classes as possible, possibly adding 3000- and 4000-level classes as their interest dictates.

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 vary widely in their interests and requirements. For this reason students are strongly urged to consult with an advisor in the Biology department, whether they are planning a 3-year, 2-year or only 1-year programme in Biology. Faculty advisors are available in the following fields (among others): Molecular biology, W.C. Kimmins, L.C. Vining; Microbiology, R.G. Brown, R.P. McBride; Genetics, L.E. Haley, O.P. Kamra, R.W. Lee, E. Zouros; Ecology/Environmental Studies, R.W. Doyle, B. Goldsmith, J. Harvey, P: Lane, K.H. Mann, I. McLaren, J.G. Ogden, E.C. Pielou; Physiology/cell biology, E. Angelopoulos, M.L.Cameron, J. Collins, R.K. O'Dor, D. Patriquin; Developmental Biology, B. Hall, G. Hicks; Big Picture, J. Farley, K. vonMaltzahn.

The departments of Biology and Microbiology offer both a coordinated 2-year programme in Microbiology. These programmes are designed for students entering their second year of study. Students interested in these programmes are urged to consult either of the departments concerned at their earliest opportunity; faculty advisors are R.G. Brown (Biology Dept.) and D.B. Stoltz (Microbiology Dept.)

general types:

view of biology.

Honours students must attend a weekly Honours Seminar in their fourth year. Combined honours students doing thesis work in the Microbiology Dept. may participate in a Microbiology seminar (weekly) series, in lieu of the Biology Dept. Honours Seminar

# **Unspecialized Programme**

## Areas of Specialization

# Programme in Microbiology

## Classes Offered

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 Degrees and Courses.

Biology class offerings may be grouped into four

1. Introductory biological principles - Biology 1000. This class is designed for students with no previous biology or for students in the health science or other sciences who require an over-

2. Core classes - These consist of a full-year class Biology 2000 and six half-year classes 2010A/B-2060A/B. The six half-classes are grouped into three categories, as follows: Category I, Biol. 2010, 2020; Category II, Biol. 2030, 2050; Category III, Biol. 2040, 2060. Note that all biology major and honours students are required to take at least one half-class from each category, plus Biol. 2000. The material in these categories represents the irreducible minimum of biology required for a major, and students are urged to take as many of these basic half-classes as possible. Biology 2000 is required of all Biology major and honours students.

3. 3000-level classes — Intermediate classes are mainly for second and third year students. The classes Biology 3110A-3324 represent studies of the biology of the groups of organisms specified. The other 3000-level classes are concerned particularly with principles in molecular, developmental and environmental biology. 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 permission of the instructor. Where biology courses are identified as being given in another department (e.g. Anatomy), that department should be consulted for details.

Introductory Classes Offered

All students registering for a biology class for the first time should read the following regulations carefully before completing registration.

(a) Course 1000 must be taken by those who did not take, or scored less than 75% in, Grade 12 Biology. It thus serves as an introduction to biology and enables students to progress to other offerings in the Biology Department.

(b) Students who receive credits for 2000, 2010A or B, 2020A or B, 2030A or B, 2040A or B, 2050A or B, or 2060A or B in their first year cannot take Biology 1000 for credit in a later year.

1000 Principles of General Biology, Study Centre 3 hrs.; Tutorial Quiz 1/2 hr.; Lecture Assembly 1 hr.; M.L. Cameron, J.G. Ogden III, M.Willison; instructors E. Tidmarsh, L. Cooke.

Biology 1000 is given in an audio-tutorial format with a study centre open on a come-any-time basis from 8:30 a.m. to 5:30 p.m. and evenings depending on demand. In addition regular tutorial

quiz sessions are held but the traditional lecture no longer has any great importance in the system this latter time slot is used for question-an answer sessions, class tests and the occasion lecture.

The subject matter puts emphasis on the features common to all or large groups organisms. It thus contrasts with Biology 2000 searching for unity among organisms rather the the major differences between groups. course starts by considering the basic function of whole organisms, studying a typical plant and typical animal. Then the organism is examined finer detail considering the structure of cells, chemistry, energy needs, the coding system, protein synthesis. This leads to the topics genetics, evolution, ecology and systematics,

Biology 1000, being a basic introductory class biology, is suitable for those students who inte to limit themselves to one university class biology and to those who have not yet decided a major. It is also a basic prerequisite for students who plan to major in biology, but s students who have superior backgrounds Grade XII biology may proceed directly to 2000-level classes if they so desire. students who have completed Grade XII bio have taken Biology 1000 and found it a useful interesting experience.

The following classes are core classes in general biology program. Students majoring Biology must take Biol. 2000 plus at least one class from each of the three categories into w the core classes have been grouped.

2000 Diversity of Organisms, Study Cent hrs.; Tutorial 1 hr. and/or Tutorial Quiz W. Bohaychuk, S. Silcox.

This class explores the great diversit organisms on this planet by considering the relation to the environments they inhabit. saprophytic organisms.

The class is taught through the audio-tutori center and no formal lectures. The study cen late evening.

2010B Molecular Biology, Lect. 3 hrs.; hrs.; W.C. Kimmins, L.C. Vining, instruc Coté. (Category I)

# hiology

This class forms a bridge between biology and memistry. Beginning with the structure and properties of the elements it explores the molecular organization of the living world in terms of physical and chemical laws. Students will acquire an introductory knowledge of the chemistry of cell constituents, and of the biochemical basis of life growth and heredity. The structure and function of proteins and their role as enzymes catalysing essential cellular processes is developed in greater depth.

Molecular biology seeks to explain the complexity of living systems as a logical consequence of the fundamental properties of atoms. The phoratory section will introduce students to some of the equipment, techniques, and deductive reasoning used to explain biological nhenomena at the molecular level

Background in chemistry is essential.

2015 Cell-Molecular Biology, Lect. 2 hrs., Discussion 1 hr.; Lab. 3 hrs.; R.K. O'Dor, J.V. Collins, W.C. Kimmins, L.C. Vining, (Category I)

A fundamental unit of living systems is the cell; hence, our understanding of any organism must begin with a knowledge of the structure and functions of cells. Our ideas concerning the cell are summarized by the cell doctrine which in its simplest form states that the cell, consisting of a nucleus and cytoplasm, is the irreducible unit of biological activities; the cell is the unit of biological structure, of function, and of reproduction

One of the major developments in cell biology during the past 30 years has been a growing belief per week; J. Farley, I. McLaren; instruct that all the phenomena which characterize life processes can be explained in physiochemical terms. This "molecularization" of our approach to cell biology is sometimes referred to as molecular biology, and has produced the following hypothesis: Biological organization is explainable in "environmental sets" of organisms are studierms of the laws of physics and chemistry and is the ubiquitous organisms, the aquatic organis based on the principle of minimum energy. One of the terrestrial organisms and the symbil the objectives of this class will be to examine this hypothesis. In doing so two concepts will become apparent; hierarchy of levels; and structure as determinant of function. A second objective is to The class is taught through the Biology 2000s determine the properties of cells and the structure, function and metabolism of cellular comopen on a come-any-time basis from momin ponents. The third objective will be to introduce You, through the laboratory, to some of the equipment, techniques and deductive reasoning used to explain biological phenomena at the cellular

> his is an integrated course covering the conlents of both Biol. 2010B and 2020A.

2020A Cell Biology: Form and Function. Lect. 2 hrs.: Discussion 1 hr.; Lab. 3 hrs.; J.V. Collins, R.K. O'Dor: instructor, T. Mobbs. (Category I)

The class introduces the basic concepts of cell structure and function. through lectures. laboratory sessions, demonstrations and films,

Lectures correlate the findings of light and electron microscopy with biochemistry.

Laboratory work is integrated with the lecture material and includes the theory and practice of light microscopy, staining and histochemistry, and observations on cell division and chromosome structure.

Students are expected to develop and show competence in expressing ideas in writing, in performing and recording observations in the laboratory. and in expressing themselves orally in group discussions.

proach

The following three questions will be discussed in this class: (1) What is the nature of the genetic material, i.e. the structure and function of DNA; (2) How is the genetic information transmitted from one generation to the next; and (3) How does the genetic material act? Taught by audio-tutorial method.

A study of evolution as the interaction of genetic and ecological processes. The first half of the class introduces certain areas of population and quantitative genetics as means of understanding evolution at the genotypic and phenotypic level. In the second half of the class these ideas are applied to the problem of the origin of species, large-scale patterns in the fossil record of life on earth, and to aspects of human biological and cultural evolution.

There are two lectures and a tutorial every week with a problem set or paper due at each tutorial. A

Texts: Dyson (1974), Cell Biology: A Molecular Ap-

Prerequisite: High school chemistry.

2030A/B Genetics, lect. 1 hr.; tut. 1 hr.; L.E. Haley, O.P. Kamra, R.W. Lee; instructors, A. Hicks. (Category II)

Text: Goodeneough & Levine, Genetics.

2040A/B Evolutionary Biology, Lect. 3 hrs.; Tutorial 1 hr.; optional laboratory, time to be arranged; R.W. Doyle, E. Zouros; instructor, S. Singh. (Category III)

thorough grasp of Mendelian genetics at the senior matriculation or Biology 1000 level will be assumed from the beginning; experience indicates that the background provided by Biology 2030 may be helpful. An optional lab is offered.

2050A/B Developmental Biology, Lect. 3 hrs.; lab. 3 hrs.; B.K. Hall, G.S. Hicks; instructors, B. Joyce, W. Joyce. (Category II)

This class discusses the principles of both plant and animal development, emphasizing the experimental approach. Topics covered include: factors initiating development; embryogenesis; typical developmental patterns; analysis and regulation of growth and ageing; cell specialization and its possible reversal.

2060A/B Ecology, lect. 2 hrs.; Lab. 3 hrs.; P.A. Lane; instructor, C. Bays. (Category III).

The lectures offer an overview of ecology, considering the adaptations of organisms to their environment, the ecology of individuals, the regulation of numbers in single-species populations, various interactions among such populations, and finally the complex interactions involved in the structure, function, and development of ecosystems. The laboratories give some insight into techniques and modes of thought used by ecologists.

The following is an interdepartmental half-credit class, not forming part of the core programme normally required of Biology majors and honours students:

2100A/B Introductory Microbiology, Lect. 2 hrs.; Lab. 3 hrs.; D.B.Stoltz (course coordinator), R.G. Brown, G.C. Johnston, R.P. McBride.

This class introduces the basic concepts of microbiology through lectures, laboratory sessions, demonstrations and films. Subjects to be covered 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.

Prerequisite: Biology 1000 or equivalent.

# 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.

3010A Metabolism I, Lect. 2 hrs.; Lab. or Tutorials: 1-3 hrs.; W.C. Kimmins, instructor M.J. O'Halloran.

The pathways of degradation and synthesis of molecules within the cell and the transformation of energy.

Prerequsite: Biology, 2010A or B. Text: Lehniger, Biochemistry, 1975. (2nd Ed.)

3011B Metabolism II, Lect. 2 hrs.; Lab. or Tutorials: 1-3 hrs.; L.C. Vining; instructor M.J O'Halloran.

Metabolic pathways information transfer and con trol of metabolism within the cell.

Prerequisite: Biology 2010A or B. Text: Lehniger, Biochemistry, 1975. (2nd Ed.)

3021A Techniques in the study of the cell: M Willison

This course is designed to familiarize students with techniques available to elucidate function and form of cells and cell organelles. Two weeks are set aside to cover topics of special interest to members of the class. See Biology 4021B.

3022A Microbial Ultrastructure, (Microbiology Dept.)

3030B Molecular Genetics of Prokaryotes Lect. 2 hrs.; Lab. 3 hrs.; L.E. Haley.

The replication, transmission and control d genetic information in viruses and bacteria.

Prerequisite: Biology 2030A or B.

3031B Molecular Genetics of Eukaryotes Lect. 2-3 hrs.; Tut. 2 hrs.; R.W. Lee

The replications, organization, and regulation genetic material in eukaryotes. Emphasis will be placed on co-ordinating these topics into discussion of our current understanding of the genetic processes underlying development higher organisms.

Prerequisite: Biology 2030A or B, and eith Biology 2010Aor B, or Biology 2020A or B.

3035A Population Genetics, E. Zouros; le tures 2 hrs.; tutorial 1 hr.; seminar 1 hr.; l open.

Students are introduced to the theory of Population tion Genetics, which is then examined in the light of existing experimental evidence. Emphasis

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placed on the origin and fate of genetic variation natural populations as the raw material of evolution. A detailed discussion of the dynamics of change in gene frequencies and an attempt to account for the observed pattern of genetic variation in natural populations

prerequisites: Biology 2030A or B; Math 100 and Math 106 or permission of the instructor.

3050B Development and Morphogenesis in Animals, Lect. 2 hrs.; Lab. 3 hrs.; B.K. Hall.

This class assumes the material of Biology 2050A/B as background and studies the mechanisms underlying the control of development, morphogenesis and growth in animals. Tonics of studies include: descriptive embryology of invertebrates and vertebrates; mammalian development and its hormonal control; histonenesis and morphogenesis of tissues and organs; regeneration of lost body parts; growth; cellular differentiation; aspects of metamorphosis.

The laboratory classes emphasize the experimental approach to the lecture topics.

Prerequisite: Biology 2050A or B.

3060A Applied Plant Ecology Lect. 2 hrs.: Lab. 3 hrs.: F.B. Goldsmith

An analysis of plant communities as a basis for identifying appropriate forms of land-use and resource management. Various applied topics supported by case-studies and field visits.

Prerequisite: Biology 2060A/B.

**3061B Structure and Function of Ecosystems** I, Lect. 2 hrs.; seminar 1 hr.; J.G. Ogden, M.J. Harvey, R.P. McBride, K.H. Mann, P. Lane; instructor, C. Bays.

Utilizing a systems approach to production, decomposition, respiration, and nutrient cycling in terrestrial and aquatic ecosystems, this course surveys both methods and results of studies in a variety of ecosystems. Seminars will be devoted to a review of specific investigations reported in the literature, emphasizing techniques and data manipulation.

Prerequisites: Biology 2040A or B and 2060A or B, Math 100 or 150.

3063 Theoretical Ecology, Lect. 2 hrs.; lab 3 hrs.; E.C. Pielou. (Given in alternate years. Not offered in 1977-78).

Text: E.C. Pielou, Population and Community Ecology.

A practical course intended for those planning careers in ecology, theoretical or applied (forestry, entomology, conservation, wildlife management, parks administration, range management, fisheries etc.). It aims to give students a thorough grounding in techniques for estimating the numbers of individuals, or the biomass, in living populations of all kinds.

Prerequisites: Biology 2060A or B; Math. 106 or 206 or Psychol. 357.

3070 Animal Physiology I, Lect. 2 hrs.; Discussion 1 hr.; Lab. 3 hrs.; R.K. O'Dor, M.L. Cameron; instructor P. Platt.

This class discusses the mechanisms which coordinate the activities of cells within multicellular organisms and permit such organisms to maintain a stable internal environment in a changing external environment. The emphasis will be on the mechanisms most widely distributed through the animal kingdom. The laboratories will be designed to illustrate these "principles of physiology" in a variety of organisms and to demonstrate the experimental approaches used to study physiology.

Prerequisites: Biology 2000, 2020A/B. (in which a minimum C grade is required).

This class considers ecological problems whose solution entails mathematical reasoning. Discussion of recent research will illustrate, with a variety of examples from both plant and animal ecology, the whole sequence of steps that an investigation follows: this starts with formulating a problem and deciding what observations would lead to a solution; then follows the planning, performing and analysing of the observations and finally the drawing of conclusions. Emphasis is aiven to the overriding importance of judging how much (or how little) a particular set of field observations can contribute to general ecological theory.

Prerequisites: The class is intended for honours students who have done Mathematics 100 or 151. Other mathematical topics will be explained as they arise; the time to be devoted to them will be adjusted to the needs of the class. For students who have not done a course in elementary statistics, N.T.J. Bailey's Statistical Methods in Biology is required reading. Biology 2060A or B.

3065A Ecological Sampling Techniques, Lect. 2 hrs.; Lab. 3 hrs.; E.C. Pielou

3073 Plant Physiology Lect. 2 hrs., lab. 3 hrs.; D Patriquin.

Topics covered include photosynthesis, photobiology, metabolic control, hormones, membrane transport, water relations, translocation, symbiosis, and some aspects of soil chemistry and microbiology, Laboratory studies will emphasize "whole plant" physiology.

Prerequisite: Biology 2010A/B or Biol. 2020A/B or permission of the instructor.

3111B Microbial Activities in Nature, Lect. 2 hrs.; lab. 3 hrs.; R. Brown, R.P. McBride.

The class format will be lectures, tutorials and laboratory exercises. Microorganisms play a far more important role in nature than their small size would suggest. To illustrate this, the following topics will be 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 rhizosphere, nitrogen fixation and the mineralization of organic matter including petroleum.

Prerequisite: Biology 2100A or 2100B.

3113A Bacterial Physiology, Lect. 2 hrs,; Lab. 3 hrs.; R. Brown, D. Patriquin.

Although the class will concentrate 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. will also be covered.

Prerequisite: Biology 2100 A or B.

3114A Introduction (Microbiology Dept.)	to	Virology,
3115A Introduction (Microbiology Dept.)	to	Immunology

3116 Mycology, R. Brown, D. Brewer, R.P. McBride.

Live cultures will be used extensively to give the student a working knowledge of the major fungal groups. In addition, laboratory projects will introduce the topics of fungal growth, chemistry and ecology.

Prerequisite: Biology 2100A or B.

Bacteriology Systematic 3118B (Microbiology Dept.)

3212A Algology, lect. 2 hrs.; Lab. 3 hrs.; k von Maltzahn.

This class deals with algal organization at the cellular, organismic, population and community levels. A thematic approach is used and on passing reference is made to systematics.

Prerequisite: Grade B minimum in Biology 2000

3213A Plant Development, lecture/discus sion 3 hrs.; lab. 3 hrs.; G.S. Hicks.

The class deals with the regulation of differentia tion and morphogenesis in plants. Emphasis it placed on concepts derived from experiments with a wide variety of experimental systems, sam ple topic areas: differential gene activation, indue tion, polarity, determination, totipotenci photomorphogenesis.

The laboratory sessions emphasize application sterile culture technique to developmental prop lems.

Prerequisites: Biology 2000 and 2050A or B.

3214A Plant Design, lect. 2 hrs.; lab. o tutorials 1-3 hrs.; K.E. von Maltzahn.

This class deals with the structural design d plants in terms of the functional performance of their parts and their integration at different level of organization. Types of design are established on the basis of comparative studies of life form seeking to find homologies between the element of design. Design in relation to climate and habitat will be examined and integrated at the level of the landscape.

hrs.; lab. 3 hrs.; M.J. Harvey.

attempts over the years to produce a phylic etc. genetic classification of the existing specie genetic classification of the newer concepts Prerequisite: Biology 2000. classification arising out of the 'computer revol classification arising out of the computer test 3322B Animal Parasitology, lect. 2 hrs.; lab. 3 tion'. The latter is still in an experimental star 3322B Animal Parasitology, lect. 2 hrs.; lab. 3 here and will involve some study of numerical ta hrs.; D.P. Pielou. onomy, automated identification and key co struction.

Prerequisite: Biology 2000.

Text: A Takhtajan, Flowering Plants: their Orig Prerequisite: Biology 2000. and Dispersal, M.S. Percival, Floral Biology.

# biology

a216B Adaptation and Speciation in Higher plants, lect. 2 hrs.; lab/seminar 2 hrs.; M.J. Harvey.

This course deals with the discipline known as niosystematics or, alternatively, experimental taxonomy. The approach taken is the analytic one of 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 rimroses and irises, through bananas and maize. down to the humble, but complex, dandelion.

prerequisite: Biology 2000.

Texts: D. Briggs and S.M. Walters, Plant Variation. and Evolution; G.L. Stebbins, Chromosomal Evolution in Higher Plants:

Reference text: W. Williams, Genetical Principles and Plant Breeding.

3321 Invertebrates, lect. 2 hrs.: lab. 3 hrs.: M. Brylinsky.

An attempt will be made to understand how different groups of invertebrate animals live - what modifications have they incorporated that allow them to survive in environments or to assume a manner of life alien to their evolutionary predecessors.

Because there are so many kinds of invertebrate animals, certain morphological and functional changes will be considered in those animals where they are most pronounced or where they first occur. The course will progress chronologically through the phylogenetic series; the characteristics of the animals in a group will be considered and new physiological systems and 3215A Systematics of Higher Plants, lect. morphological peculiarities will be emphasized.

A laboratory session each week will give students This class has two main aims; first, to give cor an opportunity to examine the morphology and sideration to current speculation on the evolution life traits of live invertebrate animals based on of the flowering plants, connecting this with the observation of feeding, respiration, locomotion,

The class is intended to give students an understanding of parasitism, its diversity and ubi-

insects.

The main purpose of this class is to acquaint the student with the current state of knowledge and speculation concerning the evolution of vertebrate animals from an invertebrate ancestral line at least 500 million years ago.

An appreciation of the classification, structure and evolution of vertebrates is essential to considerations of the development and functional capacities of vertebrates and of their relations with their surroundings and with each other.

The laboratory study of a broad array of vertebrates provides the core of this class and serves to familiarize the student with the gross anatomic features of these animals while giving instruction in the traditional approach to comparison and contrast. The background which is required for this study is not particularly extensive but should incorporate the rudiments of animal form and function and an introduction to the principles of evolutionary biology. Although this class is often considered to belong at the intermediate level, it can be mastered by any diligent student who has completed a basic class in biology.

3324 Entomology, lect. 2 hrs.; lab. 3 hrs.; D. P. Pielou.

Entomology, the study of insects, is not only an important branch of academic biology; it is also one of the largest divisions of applied biology.

The class is an introduction to the study of insects and it deals with:

3323 Vertebrates, lect. 2 hrs.: tutorial 1 hr.: lab. 3 hrs.: E.T. Garside

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The structure of vertebrates and their sequential deposition of fossils in progressively more recent formation of the superficial crust of the earth form an unparalled and unequivocal exposition of organic evolution, the gradual, natural development, through the long expanse of time, of proaressively more complex organisms. Those vertebrates which have survived the stresses imposed by the restless environment 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 of vertebrates.

Prerequisite: Biology 2000.

(1) The classification and evolutionary diversity of

(2) The biology, ecology and behaviour of insects.

(3) Applied aspects — medical, agricultural and forest entomology; harmful and beneficial insects; the pros and cons of chemical control; other methods of pest control.

Prerequisite: Biology 2000.

**3400 History of Science** (same as History 310 and Physics 340), lect. 2 hrs.: tutorial 1 hr.; J. Farley (Biology), R. Ravindra (Physics).

This class is designed to accommodate students of the sciences and the arts. There are no formal prerequisites although all students must have a strong background in either a science, history or philosophy. The class will stress the period from the 16th to the 20th centuries, and will attempt to show how ideas of what constitutes an acceptable scientific explanation have changed. There will be constant emphasis on the social context of science and the interactions between the different sciences. Important: General degree students may take this class as an elective only, not including it in the 4 classes required for a biology major. Honours students may count it towards their Biology requirements. In any case, Biology 3400 and Biology 3401A may not both be taken for credit towards the Biology major.

# 3401A History of the Biological Sciences, lect. 2 hrs.; tutorials; J. Farley.

This class is intended only for 3rd and 4th year biology majors. Although beginning with the mechanization of the biological sciences in the 17th century, the class will deal mainly with interesting and significant topics in 19th and 20th century biology and medicine. It will stress the relationships between ideas in biology and in the physical sciences, in philosophy, theology and in the political arena. Important: This class may be taken only as an elective by general degree students. Honours students may count it towards their biology requirements. Students with a serious interest in the history of science in general, rather than biology in particular, are advised to take Biol. 3400 rather than 3401A. No student may count both courses as credit towards a biology major.

3410B Man in Nature, lect. 2 hrs.; tutorials 1 hr.; K.E. von Maltzahn.

This class is 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 discuss-

ed. The class is not concerned only with man's biological requirements but also his 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.

This class will be prepared for students in the arts and sciences and does not have special prerequisites. Students are, however, expected to be willing to deal seriously with questions which the class is concerned with. The class is also designed for students in biology who wish to obtain a broader framework of knowledge in biology 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.

The following classes are primarily for honours and graduate students. They are open to others with permission of the instructor.

**4010B Advanced Topics in Molecular Biology,** R.G. Brown, W.C. Kimmins, L.C. Vining.

Prerequisite: Permission of instructor.

4020A Advanced Topics in Cell Biology, meetings twice per week, J.V. Collins and staff.

The class is open to any student with a background in cell biology (including molecular biology and advanced genetics) who is interested in studying cell physiology, morphology, and development. Students will be asked to discuss selected topics from a list provided, after the have read and written papers on these topics. In struction will be primarily by student seminar and group discussion, with few or no lectures.

Prerequisite: permission of the instructor.

# 4021B Cytology Project; M. Willison

A research project using one or more of the skil acquired in Biol. 3021A (Techniques in the Stud of the Cell), selected by the student in consult tion with the instructor.

4022B Microbial Ultrastructure Project (Microbiology Dept.)

# hiology

4030A Advanced Topics in Genetics, Lee and Staff.

A general topic from the current literature in genetics will be examined in seminar format. The nature of the topic and the instructor in charge of the class will vary from year to year. Students will be expected to present at least one seminar during the term.

prerequisite: Permission of the instructor.

4033 Microbial Genetics. (Microbiology Dept.)

4050B Seminar in Development, Seminar 2 hrs.; B.K. Hall.

Current concepts and models of cellular differentiation, organogenesis, morphogenesis and embryonic development. Emphasis on vertebrates.

Prerequisites: Biology 2050A or B, and Biology 3050B.

**4061A Advanced Topics in Ecology Seminar** I, lecture and discussion 2 hrs.; E.C. Pielou and staff.

4062B Advanced Topics in Ecology Seminar II, lecture and discussion 2 hrs.; K.H. Mann and staff.

4064C Pleistocene Biogeography, lab. 3 hrs.; H.B.S. Cooke, J.G. Ogden, III.

Lecture, discussion, and laboratory experience in the reconstruction of environmental change during the Pleistocene epoch. Laboratory and field experience will 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, dendrochronology, geochemical and isotopic dating methods will be explored. Field and laboratory work include a class problem in an area in the Halifax region.

Prerequisites: At least two credits in Biology or Geology. This course is to be taken in conjunction with Geology 457 Pleistocene Geology. Permission of the instructors, May be counted as Biology or Geology half-credit.

**4065B Topics in Population Biology** seminar <sup>2</sup> hrs.; R.W. Doyle.

Controversial topics in the general areas of population ecology, population genetics and evolutionary theory. Topics will vary from year to year but generally will emphasize quantitative genetics, natural selection and life-table phenomena, and the genetics of adaptation to local environments. The research literature is the only text. Seminars every week plus five essays.

Prerequisites: Biology 2040A or B, 2060A or B, Math 100 or 150. (a minimum B grade is required).

4066B Microbial Ecology, lect. 2 hrs.; lab 3 hrs.; R.P. McBride.

A format of directed reading, essays and discussions will be used to introduce the following topics: micro-organism populations; the functioning of micro-organism communities; interactions between microbes and macro-organisms; and the use of micro-organisms to examine ecological theory. A laboratory project will be chosen to suit the student's interest and background. Permission of the instructor is required.

Prerequisites: Background in ecology, and microbiology.

**4067B** Introduction to Biological Oceanography, lect. 2 hrs.; G.A. Riley (Oceanography dept.).

A survey of marine populations and their relationships with their physical environment and with each other. Permission of the instructor is required.

**4069B Ecological Diversity,** lect. 2 hrs.; discussion 1 hr.; E.C. Pielou.

A critical study of the diversity of ecological communities; i.e. of the factors determining the species-richness of a community and of the relative abundances of the species.

Prerequisites: Math 206; Biol. 3063 or 3064 or 3065; instructor's permission.

**4070A Animal Physiology II,** lect. 2 hrs.; lab. 3 hrs.; R.K. O'Dor, M.L. Cameron; instructor P. Platt.

This class is designed as an extension of Biology 3070 (Animal Physiology I) and will deal in greater depth with topics considered there. However, emphasis will be on the diversity of mechanisms used in different animals to solve similar problems. Practical work in the laboratory will also be emphasized and students will be encouraged to follow their interests and develop their own experimental approaches.

Prerequisite: Biology 3070.

Easterbrook K.B. 4114B Virology, (Microbiology Dept.).

4115B Immunology, L. Kind (Microbiology dept.).

Prequisite: Biology 4115.

4214B Physiology of Marine Algae, lect. 2 hrs.; J.S. Craigie.

A comparative study of the physiology and biochemistry of the various algal classes will be conducted. This will include studies of carbohydrates, proteins, fats, pigments and nutrition.

Prerequisites: Biology 2010A or B, 3010A.

4275B Topics in Algology, seminar 3 hrs.; lab. project; A.R. Chapman.

Discussion of current research topics.

4324 Advanced Entomology, seminar and discussion, 2 hrs.; plus necessary time on. project work; D.P. Pielou.

A course of directed reading, discussion, and practical projects - not necessarily the same for each student in the class. Readings and projects will be chosen to suit the individual student's interests, background, and future plans.

Prerequisites: Permission of the instructor and Biology 3324. Each prospective student must approach the instructor at the end of the preceding academic year, and, if accepted, make a synoptic collection of insects during the summer months.

4379B Ichthyology, lect. 3 hrs.; E.T. Garside.

Evolution, systematics and structure, embryology, life history and distribution of fishes.

Prerequisite: Biology 3323.

4400 Ethology, lect. 2 hrs.; lab. or field work 3 hrs.; B. Rusak (Psychology dept.).

The behaviour of animals is studied in the field and in the laboratory. These observations and other presented material will be discussed in the context of modern ethological theory.

4401 Pharmacology: Influence of Chemical Agents on Living Organisms, lect.; Mon., Wed., Fri. 1:30; lab.: Wed. 2:30-5:00 p.m.; D.J. Echobichon (Pharmacology Dept.).

This introductory class is designed to acquaint

students with the actions of drugs physiological and biochemical functions of man and lower animals. The basic mechanisms of an tion and structure-activity relationships of various groups of pharmacological agents will be stress ed and, wherever possible, discussed at the molecular and macro-molecular level of ce organization. Factors influencing the absorption distribution, biotransformation, and excretion of drugs will be discussed, as will potential uses.

The lecture course will be augmented by a prac tical laboratory course designed for student part ticipation in the demonstration of basic principles of pharmacology.

4403 Human Physiology, lect. 3 hrs.; lab.; hrs.; B. Issekutz (Physiology/Biophysics Dept.).

A class dealing with the physio-chemical basis the physiological processes in man.

Prerequisite: Introductory classes in Chemista and Physics. Permission of the instructor is n auired.

4421 Comparative Vertebrate Histology, D.M 4806A/4807B Special Projects, staff. Chapman (Anatomy dept.).

An advanced histology course surveying th whole range of vertebrate tissues and organs.

Prerequisites: Biol. 2020A or B and Biol. 3323 and permission of the instructor.

4451A Organs of Sense; R.W. Dyke (Physiology/Biophysics dept.).

General principles of organization and physiolog of selected sense organs. Includes gue speakers.

Prerequisite: Permission of instructor.

4454A Membrane Transport Theory: Richardson (Physiology/Biophysics dept.).

A mathematical development of the physical pl ciples governing the movement of molecul across membranes, biological membranes in p ticular.

Prerequisite: Permission of instructor.

4455A Biological Control Systems; H.K. W (Physiology/Biophysics dept.).

Control is ubiquitous in biological systems. curring at all levels from the subcellular to communal. This class will include the gen

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mathematical techniques required for the analysis of such systems.

prequisite: Permission of the instructor.

4456B Electrical Activity of the Heart; W.J. Elfler, B.A. Horacek (Physiology/Biophysics dept.).

The aim of this course is to establish the relationship between measured electrocardiographic hody surface potentials and the underlying electrical phenomena of the heart.

prerequisite: Permission of the instructor.

1459B Mechanics of Cardiac Muscle: A.Y.K. wong (Physiology/Biophysics dept.).

Mathematical characterization of the mechanics and energetics of muscle.

Prerequisite: Permission of the instructor.

4800 Special Topics.

4900 Honours Research and Thesis.

Students who are interested in such a programme should plan in their first year to take at least four classes from the following:

(2) A student who wishes to develop a competent reading knowledge of French should take French 102 or French 106, preferably in the 1st year.

# canadian studies

### **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, History, Political Science, French, and Sociology,

### 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 in the list appended below. 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.

### Classes

### Yearl

(1) Three classes from: **Economics 120, Principles of Economics:** An Historical Approach English 100 (See English Department Supplement for sections with Canadian content.) History 120 The History of Canada History 199 Sections, 2, 9, 13 and 16 Political Science 1100 Sections 1, 2 and 4. Sociology 100

A fifth class in the first year has been left as open option, but students might consider doing Geology 140 as a useful environmental base.

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### Year II

Students should plan to take at least one class within their major department from the list appended.

They should also plan to take two classes outside their major department from the same list, as follows:

English 207 Canadian Literature

English 231 Modern Canadian and American Novels

Economics 232 Canadian Economic History French 202 Spoken and Written French, (Canadian Sections)

French 230 LeConte, 18th-20th Centuries French 231 20th Century Theatre, French and **French Canadian Texts** 

History 220 A People at Work: Social and **Economic History of Canada** 

History 227 The Atlantic Provinces

Political Science 2200 The Canadian Political Process

Political Science 2510 Canadian External Relations

Sociology 205 Sociology of Religion Sociology 211 Canadian Society Sociology 220 Sociology of the Family

### Year III

Students should take at least two classes within their major department in Canadian studies and two classes outside of it, from the following list:

**Economics 325 Labour Economics Economics 329 Urban Economics Economics 326A Monetary Economics Economics 426B Monetary Economics Economics 432 Regional Economics** Economics 433B Inter-governmental Fiscal Relations English 357 The Making of Modern Poetry in Canada French 312 French and French Canadian Civilization French 340 French Canadian Literature History 324 Society, Economy, Conflict in the Canadas, 1791-1872 History 326 The Response to Industrial Capitalism in Canada, 1850-1935 History 327 The Nova Scotian Experience, 1815-1945 History 328 The Age of Macdonald and Laurier, 1850-1911 History 329 The Social Outcast in Canadian History Political Science 3204 Politics, Government and **Constitution of Canada** 

Political Science 3208 Canadian Province **Politics** 

Political Science 3212 The Politics and Gover ment of Nova Scotia Political Science 3216A Local and Region **Government in Canada** 

Political Science 3220A Inter-governmental Rev tions in Canada

Political Science 3221B Case Studies in tergovernmental Relations

Political Science 3228A The State and Economy in Canada

Political Science 3570 Canadian Foreign Policy Sociology 320 Social Change and Canadian Social tv

It should be possible for students to take number of 2nd year classes in their 3rd year, a in a few cases, vice versa.

How to arrange it

Students wishing to discuss a Canadian Studie Assistant Professors Programme, or wishing to take it, should get R.J. Boyd touch with any of the following, within th A Chattopadhyay T.B. Grindley respective departments: R.D. Guy

Professor B. Lesser, Economics Department Professor M.G. Parks, English Department Professor Hans Runte, French Department Professor P. Butler, Sociology Department Professor J.M. Beck, Political Science Depar A Terzis ment

Professor P.B. Waite, History Department

Lecturer M.L. Heit

**Visiting Professors** J.W. Scheeren J. Hirst

Demonstrators M.E. Nearing P. Renault S. Sawler D. Silvert M. Yeats

**Research Associates** S. Kapila D.A. Othen

Postdoctoral Fellows A. Gupta K. Iwasa . Kurzawa A. Langler A. Matinopoulos G. Matinopoulos A. Oxton R. Shanker .Webb Wasson

teaching

# chemistry

(Chairman of Department)

Chemistry

Professors

W.E. Jones

W.A. Aue

W.J. Chute

IA Coxon

T.P. Forrest

K E. Haves

K.T. Leffek

TS Cameron

J.S. Grossert

D.L. Hooper

L. Ramaley

J.C.T. Kwak

P.D. Pacey

J.A. Pincock

R. Stephens

C.H. Warren

G.A. Dauphinee

Associate Professors

O. Knop

D.E. Ryan

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, since mathematics is the language of the physical sciences. We say honours programme advisedly, for 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, reflecting the diversity of fields in which chemistry plays an important role. For some students, a first degree in Chemistry will provide a background for further graduate work in medicine, law, business administration, biochemistry, oceanography, geology or other areas. Many students will proceed in further studies in chemistry, working toward the degree of M.Sc. or Ph.D. A postgraduate degree is essential for those who wish to engage in independent original research or in university

Chemistry 110 is an introduction to the discipline. Non-science students who elect to take chemistry to fulfill requirements for a degree will find that the subject provides a good insight into the scientific method. Many students who do not intend to become professional chemists are required to take introductory chemistry and may be required to take second and third-year classes in the subject as well. This group of students can include those taking courses in engineering, premedicine, pre-dentistry, dental hygiene, nursing and pharmacy. 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 areas of specialization into which chemistry has been traditionally subdivided. 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 primarily devoted to the study of how and why chemical reactions occur and the rate at which they proceed. Beyond the second year level, a student's studies in chemistry become increasingly concentrated in

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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.

Because advances in chemistry have been and continue to be published in many languages, those who look forward to postgraduate study and research are urged to acquire a reading knowledge of at least two foreign languages. These are usually chosen from among French, German and Russian.

# Degree Programmes

# General Degree with Major in Chemistry

In order to obtain as general a chemical background as possible, the student after taking Chemistry 110, should include in his program the classes 211B, 220A, 231A, 232B and 240, which give exposure to the four areas of specialization in chemistry. The remaining requirements in chemistry may be chosen from the third and fourth year classes depending on the student's major interests. Each student who plans to major in chemistry should consult with his or her departmental advisor each year regarding his or her programme of study. The student's programme should also include Mathematics 100 and 101 and Physics 110.

# **B.Sc. with Honours in Chemistry**

This programme is intended to provide a broad training in chemistry while at the same time it makes provision for the individual interests of students. All honours students are required to consult annually with the Chairman of the Department, and to obtain his approval of their course selection.

# Year I will normally consist of:

- 1. Chemistry 110
- 2. Mathematics 100 and 101
- 3. A foreign language at the 100 level
- 4. One of Biology 1000 or 2000 Geology 100 or
- Physics 110
- 5. Elective

# Years II, III and IV must include:

1. Chemistry 211B, 220A, 231A, 232B, and 240 2. Six full classes from Chemistry 300 and 400 levels. Chemistry 300A, 311A, 312B, 321A, 322B, 330C, 331B, 341A, and 342B are required classes. In addition the non-credit courses 388 and 488 must be taken.

3. Mathematics 200 or 220 a prerequisite for Chemistry 300A, 330A and 331B.

4. Five other classes. These must be chosen as follows:

a) If Physics 110 or a foreign language were not taken in Year I, they must be taken in Years II-IV.

b) Two classes beyond the 100-level must taken in a minor subject. Minor subjects allow for this degree are biochemistry, biological geology, mathematics or physics.

It is suggested that these five other classes. chosen according to the future plans of the dent. For example: those planning future study physical chemistry should take additional main matics and physics classes; those plann future study in organic chemistry should take or more biology classes: those planning fut study in geochemistry should take one or me geology classes.

# **B.Sc. Combined Honours Programs**

The department has designed a number of m grammes which allow a student to obtain a Co bined Honours Degree in Chemistry with one Biology, Geology, Mathematics or Physic Students who contemplate this type of progra should consult with the Departmental Chairman

**Classes** Offered

# 105 Chemistry For Dental Hygiene Students lect.: 3 hrs.; lab.: 3 hrs.; G.A. Dauphinee.

This class is taken by dental hygiene students their first year. It will not serve as a prerequisite second-year chemistry classes and is only credit course in the School of Dental Hygie Organic chemistry is discussed in the second of the year, since the regular programme of students does not include further study chemistry. The subjects discussed in the term include atomic structure, solution equil and simple inorganic chemistry. Laboratory periments are integrated with the mate discussed in lectures. Quantitative aspects chemistry are not emphasized in this class.

110 General Chemistry, lect.: 3 hrs.; tutorial: 3 hrs.; W.A. Aue, R.J. Boyd, Cameron, A. Chattopadhyay, W.J. Ch G.A. Dauphinee, R.D. Guy, K.E. Hayes, M Heit, J. Hirst, J.C.T. Kwak, P.D. Pacey, A zis.

This is an introductory class in college chemis with lectures and tutorials on a number of top in physical and structural chemistry. Included strumental methods of analysis. stoichiometry, acid-base and oxidation-reduct stoichiometry, acid-base and oxidation-reduce Prerequisite: Chemistry 110 thermochemistry, equilibrium, chemical kine and atomic and molecular structure.

Emphasis is placed on the formulation of the which will be useful in the correlation perimental facts, rather than on the memoriza

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of the facts themselves. Wherever possible, such of the last derived using standard mathematical a theory from basic physical principles. In tests and examinations students are expected to demonstrate their knowledge of the basis of these theories and of their limitations and to show a logical approach to the solution of numerical problems.

It is assumed that students entering this class will have some knowledge of elementary chemistry, mathematics and physics. The minimum background in chemistry is the equivalent of Nova Scotia Grade XI with emphasis on its numerical aspects. It is important that students be able to use exponents and logarithms, proportionality and variation, and be able to solve quadratic and simultaneous equations

211B Introductory Inorganic Chemistry, lect.: 2 hrs.; lab.: 3 hrs.; optional tutorial: 2 hrs.: O. Knop.

The material covered includes principles of nomenclature, radioactive disintegration and its applications, electronic structure of atoms. elements of molecular-orbital theory and inorganic stereochemistry, principles of crystal chemistry, and a certain amount of systematic chemistry of inorganic compounds. The preparation and analysis of inorganic compounds will be the laboratory assignments.

Prerequisites: Chemistry 110 and Mathematics 100 and 101 (or equivalents). These classes cannot be taken concurrently with Chemistry 211B.

220A Introductory Analytical Chemistry, lect.: 2 hrs.; lab.: 3 hrs.: R. Stephens

Chemistry 220A covers those aspects of solution equilibria of importance to analytical chemistry. These inlcude solubility, acid-base, redox and metal complex equilibria. Associated qualitative and quantitative analytical techniques are discussed; these include gravimetric analysis, titrations (acid-base, non-aqueous, complexometric, redox), and separation methods. Treatment of errors in analytical data is given. Examples of all the above techniques are used in the aboratory to undertake the qualitative and quantitative analysis of unknown materials. The course is concluded with a brief introduction to in-

231A Introductory Chemical Thermodynamics, lect.: 3 hrs.; lab.: 3 hrs.; R.J. Boyd, C.H. Warren.

100 and 101

This class will introduce the student to the fundamentals of kinetics and includes methods of measurement, basic rate laws, mechanisms and theories of reaction rates. Specific examples of some simple and complex reactions in the gas phase and in solution will be discussed. Elementary aspects of the kinetic molecular theory, molecular spectroscopy, statistical mechanics and photochemistry will be also presented.

In the laboratory, the student will be exposed to various experimental techniques used in the fields of kinetics, photochemistry and spectroscopy.

Prerequisites: Chemistry 110 and Mathematics 100 and 101. Although not essential, Chemistry 231A is recommended.

This class will provide a broad introduction to the chemistry of carbon compounds, including molecular shapes and bonding, characteristic reactions and the way in which they take place, and the application of spectroscopy to organic chemistry.

Prerequisites: A good comprehension of the principles studied in Chemistry 110. In particular, the student is required to understand the relation between carbon and the other elements of the periodic table; valence; covalent and ionic bonding; electronic orbitals; orbital hybridization and the determination of molecular geometry by all

Thermodynamics, one of the major areas of physical chemistry, is essentially a study of energy and is applicable to energy changes associated with chemical reactions, as well as physical, biological and geological processes, The position of chemical equilibrium is one of the major concerns of chemical thermodynamics. The lecture periods include discussions of the following topics: three laws of thermodynamics and their application, free energy, chemical equilibrium, colligative properties, phase diagrams and electrochemistry. The laboratory sessions will give students an opportunity to perform experiments which illustrate many aspects of the above topics with modern techniques and apparatus.

Prerequisites: Chemistry 110 and Mathematics

232B Introduction to Kinetics and Photochemistry, lect.: 3 hrs.: lab. 3 hrs.: W.E. Jones, C.H. Warren,

240 Introductory Organic Chemistry, lect.: 3 hrs.; lab.: 3 hrs.; T.P. Forrest, J.S. Grossert, T.B. Grindley, D.L. Hooper, J.A. Pincock.

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types of s and p atomic orbital hybridization; electronegativity; the physical chemistry of solutions; chemical equilibria; velocities of reactions; oxidation-reduction; acids and bases.

243 Introductory Organic Chemistry with Biochemistry, lect.: 2 hrs.; lab.: 3 hrs.; W.J. Chute.

This class is taken by nursing students. It will not serve as a prerequisite to third-year classes in chemistry and is only a credit course in the School of Nursing. During the first term a basic introduction to the chemistry of carbon compounds is given. In the second term students transfer to the Biochemistry Department.

300A Introductory Theoretical Chemistry, lect.: 2 hrs.; C.H. Warren.

This class provides an introduction to quantum mechanics and its application to spectroscopy and the electronic structure of atoms and molecules. The postulates of quantum mechanics are first presented and applied to some simple physical systems. This is followed by a discussion of the rotations and vibrations of molecules, the electronic structure of atoms, molecules and the chemical bond and the electronic structure of conjugated molecules.

Prerequisites: Mathematics 200 and 220 and Chemistry 211B or 231A or 232B.

311A Chemistry of the Main Group Elements, lect.: 2 hrs.; lab.; 3 hrs.; T.S. Cameron.

The aim of the class is to undertake a systematic study of the chemistry of the main group elements, with particular emphasis on the nonmetals of the first and second row elements. Appropriate use will be made of modern bonding concepts such as molecular orbital theory and multi-centred bonds.

The laboratory will introduce the students to synthetic procedures for the preparation of inorganic compounds and will include a study of their reactions. In general, these require special handling techniques, such as controlled atmosphere, very high temperature or vacuum line manipulation.

Prerequisite: Chemistry 211B.

312B Chemistry of the Transition Metals, lect.: 2 hrs.; lab.: 3 hrs.; A. Terzis.

This class deals with the transition elements and their complexes. Use is made of modern bonding theories, i.e. crystal field and ligand field theories,

with a view towards unifying the chemical a physical properties of these substances.

In the laboratory the experiments are chosen demonstrate the principles and uses of h temperature techniques, non-aqueous solven crystal growth; the role of metals in life pr cesses. Use is made of several spectroscon methods (NMR, UV, VIS, IR) for the characteri tion of the compounds that are synthesized.

Prerequisite: Chemistry 211B.

321A Solution Equilibria and Analytical Spe troscopy, lect.: 2 hrs.; tutorial: 1 hr.; lab hrs.; D.E. Ryan.

Chemistry 321A is organized into three units:

1. Introduction and statistics - elementary or cepts, stoichiometry, the evaluation of analyt data.

2. Chemical equilibria and their analytical plications - fundamental concepts, aqueo acid-base reactions, equilibria calculations, h curves, effect of structures on acidity, r aqueous solvents and acid-base titrations, me ion titrations, equivalence point detectors dicators).

3. Spectrochemical methods of analysis - e molecular spectroscopy, molecular lumine discussed in terms of partition functions. cence spectroscopy, infrared and raman, ato elemental analysis (flame emission, atomic a The laboratory, where students must complete sorption).

The program of laboratory experiments is des ed to illustrate the above techniques with pl tical examples.

Prerequisite: Chemistry 220A

rations, lect .: 2 hrs.; tutorial: 1 hr.; lab.: 31 L. Ramaley.

Chemistry 322B deals with the application of trochemical and separation techniques chemical analysis. The basic chemical physical principles are explained, application analytical problems are examined and instrum tation is described. The material on a trochemistry starts with a review of our catalysed, the steady state approxima-reduction theory and equilibria and a description and its application, the Rice-Herzfeld ap-of redox and ion selective electrode behavior complex reactions, photolysis, lumines-Next the potentiometric use of these electrode types reactions. Examples will be drawn from reactions

# chemistry

coulometry and polarography are examined. The material on separations includes sections on separation by precipitation, solvent extraction. and all forms of chromatography. Emphasis is placed on thin layer, high speed liquid, and gasiquid chromatography.

The laboratory work is concerned with practical examples of the above techniques in both qualitative and quantitative analysis.

prerequisite: Chemistry 220A

and Chemical Thermodynamics, lect.: 2 hrs.; lab.: 3 hrs.; K.E. Hayes.

This class, while primarily intended for Chemistry Honours and major students should prove of intorest to students in the fields of Biology. Biochemistry and Geology.

The class will proceed via a review of the laws of thermodynamics as applied to ideal closed systems, to consider the problems of real gases and open systems. Extensive use is made of the chemical potential and the various Maxwell relafers, titration curves, fractional distribute tionships. Specific topics to be covered include. free energy and equilibria, phase equilibria, fugacity, activities and activity coefficients, solutions of electrolytes and the Debye-Huckel theory, partial molar quantities and E.M.F.'s and the thermodynamics of ions. At appropriate times throughout the term the statistical approach to tromagnetic radiation and interaction with malt thermodynamics will be introduced and the enmeasurements, fundamental laws, UV-visit tropy, heat capacity energy and free energy will be

> five or six experiments through the term, is open at all times. The laboratory work is designed to help the student gain confidence in results that he may obtain in any laboratory. Four of the experiments will be written up during the term as formal reports, following the format of the Canadian Journal of Chemistry.

322B Analytical Electrochemistry and Set Prerequisites: Chemistry 231A and Mathematics

331B Chemical Kinetics, lect.: 2 hrs.; lab.: as leeded; K.E. Hayes, P.D. Pacey.

his class deals with the rates and mechanisms chemical reactions. Topics will include the leatment of experimental kinetic data obtained rom simple and complex reactions, both catalystation is described. The material oxidat ed and non-catalysed, the steady state approxima-trochemistry starts with a review of oxidat find and its Teory.

The laboratory will be open at all times. Each student is expected to complete at least five experiments.

The purpose of this class is to introduce the student to the techniques necessary for the identification of organic compounds. Although there will be some presentation of the classical, wet, qualitative analysis methods the main emphasis will be on modern spectroscopic techniques. such as nuclear magnetic, infrared and ultraviolet spectroscopy and mass spectrometry. The course will be built on the framework of the functional group classification developed in introductory organic chemistry courses. The laboratory section of the class will involve identification of unknown substances by the methods covered in the lecture material. Students must work independently in the laboratory in order to solve their own individual problems.

This is an imtermediate class in organic chemistry with the aim of extending the student's knowledge of functional groups and their reactions. The class will begin with a brief outline of the principles of these reactions which will then be used as the basis for the understanding of synthetic organic chemistry. The subject will be presented so that the student sees how individual reactions are applied to multi-step organic preparations. In the laboratory section, students will work individually using many standard techniques for the preparation or organic compounds. Both single-step and multi-step procedures will be undertaken so that a good understanding of the practical problems involved in organic synthesis will be attained.

Prerequisites: Chemistry 240 (or equivalent)

343A Bioorganic Chemistry, lect.: 3 hrs.; T.P. Forrest.

in the gas phase, at the gassolid interface and in liquid solutions. An understanding of the mechanism of chemical reactions will be sought by usng the methods of Absolute Reaction Rate

Prerequisites: Chemistry 232B and Mathematics 200 or 220.

341A Identification of Organic Compounds. lect.: 3 hrs.: lab.: 3 hrs.: T.P. Forrest.

Prerequisites: Chemistry 240 (or equivalent)

342B Pathways of Organic Chemistry, lect.; 3 hrs.; lab.: 3 hrs.; J.A. Pincock.

Since molecules in nature operate under the

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same rules as govern molecules in an organic laboratory, one can apply those principles which have been elucidated in the organic laboratory to the study of the behaviour of organic compounds in nature. In order to cause a reaction to occur in the laboratory it might be necessary to alter functional groups and provide other conditions necessary to induce reactivity of a particular type. 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 of this course.

Reactions to be analysed will be selected from sources such as primary metabolic pathways, biosynthetic pathways, metabolism of chemotheropeutic agents, and co-enzyme functions. The class will be built on a framework of types of reactions and factors controlling reactivity rather than a survey of compounds found in nature.

This class may not be included in the nine chemistry credits required for an honours chemistry degree (Degree Programmes 5.3.5.1 (i)). It may however be taken by honours chemistry students in addition to these nine.

Prerequisites: Chemistry 240 (or equivalent)

388 General Topics in Chemistry. A noncredit seminar course to be given by invited speakers which must be taken by all 3rd year honours Chemistry students.

400B Theoretical Chemistry, lect.: 2 hrs.; C.H. Warren.

The class is a continuation of 300A. Molecular orbital theory and its applications will be examined in greater detail. Group theory will be introduced and applied to spectroscopy and molecular orbital theory.

Prerequisite: Chemistry 300A.

411A Symmetry and Group Theory, lect.: 2 hrs.; compulsory tutorial: 3 hrs.; O. Knop.

This class will be concerned with the elements of the theory of abstract groups and their representations, crystallographic and non-crystallographic point groups, and an introduction to the theory of space groups. Examples from stereochemistry, crystallography, and spectroscopy will be used to illustrate the theory. Knowledge of elementary manipulations of matrices and determinants is desirable.

Prerequisites: Chemistry 211B and Mathematics 200 or 220, or consent of instructor.

## 412B Solid State Chemistry, lect .: 2 hrs. lah 3 hrs.: O. Knop.

All chemical elements and compounds can exit as crystalline solids, and most of them normal do. The arrangements of atoms and molecules such solids, known as crystal structures, close reflect the bonding properties of the constitue elements. They can be studied by methods the do not destroy or modify the crystal structure, T aim of this class is to acquaint the student w the methods most frequently employed for the purpose and with the principles of solid sta chemistry in general.

Prerequisites: Chemistry 211B, 330A, and 411A equivalents) or consent of instructor.

420A Analytical Instrumentation, lect.: 2 hr lab.: 3 hrs.; L. Ramaley, R. Stephens.

This course deals with the design and operation of modern instruments used for the qualitat and/or quantitative identification of an analytic sample. Basic principles of electronics circuit elements (resistors, capacitors, tra signal from an analytical sample, spectremet transport properties of electrolyte solutions. optical systems etc. are also discussed.

Prerequisites: Chemistry 321A and 322B or pe sion of instructor. mission of instructor.

lect.: 2 hrs.; lab.: 3 hrs.; R. Stephens.

struments are divided into 3 sections, cover of this information to photochemical problems. elemental analysis, the analysis of or molecules, and separations. Techniques cover The discussion of all topics will begin at an ininclude atomic spectroscopy with both flames troductory level. non-flame cells, arc and spark methods, non-flame cens, are and opart, manalysis, visit Prerequisite: Chemistry 231A, 232B or permission UV spectroscopy, mass spectroscopy, n magnetic resonance, and chromatography f liquid and thin layer).

Prerequisites: Chemistry 321A and 322B or a mission of instructor.

430B Introductory Statistical dynamics, lect .: 2 hrs.; R.J. Boyd.

thermodynamics and quantum statis

# chemistry

mechanics including: ensembles, the postulates of statistical mechanics; Boltzmann, Fermi-Dirac and Bose-Einstein statistics; ideal, monatomic. diatomic and polyatomic gases, and transport nenomiena. Wherever possible the application of atistical thermodynamics to chemical systems s well as physical and biological processes will be emphasized.

prerequisite: Chemistry 330A or permission of the instructor.

A31A Electrolyte Systems, lect.: 2 hrs.: lab.: 3 hrs.; J.C.T. Kwak, L. Ramalev.

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 the physical chemistry of electrolyte solutions in life. sciences and medicine. Topics include equilibrium and transport properties of solutions. especially electrolyte solutions with applications. colloid chemistry and electrokinetic phenomena as applied to e.g. electrophoresis and centrifugation, and a description of membrane transport and covered, starting with the operation of individe coupled transport with examples of biological importance. Laboratory experiments emphasize the formers, diodes and amplifying elements), and a measurement of electrical potential differences used to show how typical control and signal pr in low and high impedance systems, microcessing circuits operate. Associated devic electrodes, redox-electrodes and selective-ion such as the transducers required to obtain electrodes, as well as thermodynamic and

Prerequisite: Chemistry 231A, 232B, or permis-

432A Spectroscopy and Photochemistry, 421B Methods of Instrumental Analys lect.: 2 hrs.; lab.: 3 hrs.; W.E. Jones.

This class is designed to introduce the student to A detailed study of the operating principles the theoretical and practical aspects of atomic modern analytical instrumentation is given, and molecular spectroscopy and the application

of instructor.

440A Spectroscopy of Organic Molecules, ect.: 2 hrs.; lab.; 3 hrs.; G.A. Dauphinee, D.L. Hooper

Is class includes an introduction to the theory The of mass spectroscopy and nuclear magnetic sonance spectroscopy, however the focus of e class is the application of these techniques as An introduction to the principles of statis well as infrared and ultraviolet spectroscopic methods in the structure determination of organic ompounds.

The laboratory will illustrate the variety of methods used to study the above topics.

Prerequisites: Chemistry 341A, 342B and Chemistry 232B or equivalents, or permission of the instructors.

## 488 Advanced Topics in Chemistry.

A non-credit seminar course to be given by invited speakers which must be taken by all 4th year honours Chemistry students.

This is an additional class required of all Honour students in Chemistry in order to satisfy requirements 5.3.5.1 (c). It should be taken in the final year of a concentrated chemistry honours programme. In the case of a combined or unconcentrated honours programme the student should consult with the Departmental Chairman as to the method of satisfying regulation 5.3.5.2 (d).

The department offers graduate classes leading to the degrees of M.Sc. 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.

Prerequisite: Chemistry 341A. or equivalents, or permission of instructor.

441B Stereochemistry and Synthesis in Organic Chemistry, lect.: 2 hrs.: lab.: 3 hrs.: J.S. Grossert

Stereochemistry and synthesis, illustrated in considerable part with examples taken from the field of natural products. Laboratory experiments will be chosen to incorporate modern advanced synthetic techniques and principles.

Prerequisites: Chemistry 341A, 342B or equivalent, or permission of instructor.

442A Organic Reaction Mechanisms, lect.: 2 hrs.; lab.: 3 hrs.; K.T. Leffek, T.B. Grindley

In this class, methods for determining the mechanisms of organic reactions are discussed from the viewpoint of the physical organic chemist. Topics to be considered include applications of kinetics data, isotope and salt effects, linear free energy relationships and acid and base catalysis.

### **499 Honours Examination**

### Graduate Studies.

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### Classics

Professors A H. Armstrong I.A. Doull T F.W. Segelberg

Associate Professors J.P. Atherton (Chairman) R.D. Crouse **R** Friedrich

Assistant Professors D.K. House IM.P. Lowry

**Special Lecturers** W.I. Hankey C.J. Starnes

### Post-Doctoral Fellow PM O'Cleirigh

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 much 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 during his university course.

A student taking classics at Dalhouise can approach the study of ancient cultures through literature or through history and the study of social structures or through the study of Greek and Christian philosophy. Honours courses are offered which concentrate on any one of these three approaches.

The department also offers combined honours courses in Greek and German and in Latin and French. These courses take account of the exceptionally close links between French culture and Latin literature on the one hand and between German and Greek poetry and philosophy on the other,

Students of classics usually learn Greek and Latin. Instruction may also be had in Hebre Coptic, Syriac and Arabic.

It is obvious that classics is worth studying for a own sake by students who wish to obtain a bet understanding of the common assumptions and beliefs of our society. This knowledge has alway been regarded as pertinent to a career in politi and the higher levels of the civil service. For that who are thinking of the clergy, classics is the most relevant preparation.

Classical studies also prepare students for a li of teaching and scholarship in several direction Now that Canada is no longer a colony cultural but responsible for its own culture, 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 also the best preparation for the study of no European cultures (Chinese, Indian, Islamic, etc. and there is a growing need for specialists these fields. For the older history of philosophilo and for the history of Christian belief until, and cluding, the Reformation, a knowledge of class is indispensable. The same may be said mediaeval studies in general. Classics leads a to ancient Near Eastern Studies (Jewish, Baby nian, Egyptian, etc., and to archeology.

### Degree Programmes

### General B.A. and B.Sc.

Of classes offered by the department, Classing 101,102,103, 200 and 207 and those classes in A cient History and Religions and Ancient and Medieval Philosophy not having a Langua prerequisite should be especially useful students taking a general degree. All class beyond the 100 level are available for major a minor programmes in classics, and the Depa ment will be glad to assist students in work out programmes according to their interests.

### Honours Programmes

The candidate may choose between three p grammes: B.A. with Honours in Classics (Ancle Literature), B.A. with Honours in Classics cient History), or B.A. with Honours in Class (Ancient Philosophy). In each case, it is hig desirable, but not essential, that the stude begin the study of at least one of the class languages during the first year of study. For P poses of meeting grouping requirements, And History and Ancient and Medieval Philoso classes may be counted either as Class credits, or as History and Philosophy cred respectively.

To receive an HONOURS degree in Classics: (1) Students must complete nine to el

## classics

classes in Classics beyond the 100 level chosen classes with the general Faculty regulations for HONOURS.

10) The programme must include work in either (2) The plass Language and Literature to the 300 lavel and work in the other language to an appropriate level as determined by the Undergraduate Advisor.

(3) The programme must be approved by the Undergraduate Advisor.

whether the HONOURS degree is awarded in Ancient Literature, History or Philosophy will depend 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 bonours programme with French and German. students interested in either of these programmes should consult with the chairmen of the respective departments.

### **Undergraduate** Advisor

The programmes of all students majoring or honouring in the Department must be approved by the Undergraduate Advisor. Currently Protessor House holds the position.

> 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 101 Ancient History: An Introduction to the Cultural History of the Ancient World, lect.: 2 hrs.: D.K. House

The first term will be devoted to a study of the maor pre-classical civilizations (Sumer, Egypt, etc.) which attention will be 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 will be 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 <sup>no</sup> foreign language requirement.

Classics 102 Archeology and Art, lect.: 3 hrs., W.J. Hankey, J.P. Atherton.

# Atherton

An introduction to classical civilization by way of the literature, read in English translations Authors studied will be Homer, the Greek Dramatists, Plato, Vergil and St. Augustine.

# Friedrich.

This class is a continuation of Classics 207. It traces the development of modern drama to the 20th century. Its various forms and the theories that accompany them will be studied in comparison to ancient drama and in relation to the Aristotelian concept of drama. Much emphasis will be laid on German and Scandinavian drama

This is a study of Greco-Roman civilization from its origins to its dissolution primarily through its visual art. By a study of sculpture, mosaic, painting and architecture and a reading of some crucial literary texts we will attempt to see how the classical picture of the cosmos emerged and developed. The transformations in the view of nature and space will be considered up to the Renaissance.

This is an introductory class: no special preparation is expected and there is no foreign language requirement.

Classics 103 Introduction to Ancient Philosophy, lect.: 2 hrs., A.H. Armstrong, J.P.

An introduction to classical culture through a study of its philosophical ideas. The ideas will be presented in the religious, literary, and social context of their historical development.

Classics 200 Classical Literature, lect.: 2 hrs.: W.J. Hankey and others.

Classics 207/Comp. Lit. 207 Ancient Drama in relation to Modern Drama I, lect.: 2 hrs.; R.

Greek Theatre (production, the Dionysian festival, the origins of drama in the Dionysian ritual etc.) and a number of Greek plays by Aeschylus, Sophocles, Euripides, Aristophanes and Menander will be studied first; then Plato's critique of drama and Aristotle's defence of it in the Poetics, the first systematic theory of drama. This will lead to a study of the influence which Greek drama and in particular Aristotle's theory of drama had on the formation of modern European drama from the renaissance. This course is open to first year students. There is no foreign language requirement.

Classics 208/German 208/Comp. Lit. 208 Ancient Drama in Relation to Modern Drama II. lect. 2 hrs.: R. Friedrich.

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(Lessing, Ibsen, Hauptmann, Strindberg and Brecht).

In order to make it possible for the student who has not attended Classics 207, to take this class, the results of Classics 207 will be summarised and reviewed during the first 8 sessions.

This class is open to first year students. There is no foreign language requirement.

## Ancient History and Religions

Classics 222 Greek History, lect.: 2 hrs.; D.K. House. (Not offered in the period covered by this edition of the calendar).

Classics 223 Roman History: The Cultural History of the Roman World, lecture/seminar, 2 hrs., D.K. House.

Classics 228/528 Christian Beginnings and the Early History of the Church, seminar 2 hrs.; E. Segelberg.

The subject of this seminar for 1977-78 will be the Eucharist: its historical background, biblical foundations and development during the first centuries. Doctrinal and liturgical aspects will be discussed.

Classics 229/529 Greek Religion, seminar: 2 hrs.; E. Segelberg.

The history of Greek Religion, with particular attention to the interpretation of myth. (Not offered in the period covered by this edition of the calendar).

Classics 226/526 Roman Religion, seminar: 2 hrs.; E. Segelberg. (Not offered in the period covered by this edition of the calendar).

Classics 227/527 Near Eastern Religion, seminars: 2 hrs.; E. Segelberg.

**Classics 230 History of Christian Doctrine to** Augustine, lect.: 2 hrs.; C.J. Starnes.

The class will consider the meaning of Christian doctrines in relation to their Jewish and Greek origins and their development in the classical world. The basic text will be Augustine, The City of God.

Classics 252/552 Seminar on Problems of the Hellenistic Period, seminar: 2 hrs.; E. Segelberg. (Not offered in the period covered by this edition of the calendar.)

Classics 253/553 Seminar on the Roman Em pire and the Rise of Christianity, seminar hrs.: J.P. Atherton.

Selected topics from the transition from Classica to Christian culture will be studied. Particular at tention will be paid to the connection between religious innovation and the effect of the new beliefs on literature, art and philosophy.

## Classical Philosophy

Classics 336 Ancient Philosophy from it Beginning to the Sixth Century A.D. (Same as Philosophy 336), lect.: 2 hrs.; A.H. Armstrong

Classics 336 surveys the whole history of ancient Greek philosophical thought from its beginning 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 atten tion is paid to the great classical philosophies Plato and Aristotle studied in their historical con text: and much emphasis is laid on the Gree philosophy of the first centuries A.D. and its in fluence on developing Christian thought.

Classics 337 From Augustine to Calvin History of Christian Doctrine II, W.J. Hanker (Not offered in the period covered by this ed tion of the calendar).

Classics 338 Medieval Philosophy, (Same a Philosophy 338), lect.: 2 hrs.; R.D. Crouse.

Classics 338 (Philosophy 338) studies development of philosophy in the formative ap of European civilization and examines related political, institutional, literary and theologic concerns. An attempt is made to show how legacy of classical and Christian antiquity wasa propriated and reformed to constitute ideology of mediaeval Christendom.

The class will be devoted mainly to the study discussion of a few fundamental texts, beginn with Boethius' Consolation of Philoson 'Special attention will be given to Anselm's slogion and the first few questions of Thom slogion and the first lew questions of the objet. Not offered in the period covered by this edition Aquinas' Summa Theologica. It will be the objet of the color day of lectures to present the continuity of historical development and to emphasize historical development and to emphasize Classics 431/561 Seminar on the Philosophy broad implications of the philosophical doctrine Classics 431/561 Seminar on the Philosophy presented in the texts. In the later part of Plato, seminar: 2 hrs.; J.A. Doull, class, some attention will be given to mediaeval Platonism and Mysticism, so something can be shown of the beginning<sup>5</sup> of the calendar.) Reformation and modern philosophical religious thought.

## classics

classics 340 The Dialogues of Plato. seminar: 2 hrs.; D.K. House.

This class presupposes some knowledge of the history of Ancient Philosophy and some knowledge of Greek.

Not offered in the period convered by this edition of the calendar)

classics 341 St. Augustine's Confessions. seminar: 2 hrs.

This class presupposes some knowledge of the history of Ancient Philosophy, and some knowledge of Latin.

Not offered in the period covered by this edition of the calendar)

**Classics 345/German 365 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 course will endeavour to discover in what sense a thinking of nature is essential continuity with ancient physics is currently possible or in what sense modern natural science constitutes a philosophy of nature.

(Not offered in the period covered by this edition of the calendar).

Classics 350 Aristotle, seminar: 2 hrs.; D.K. House.

This class will study a treatise of Aristotle usually the DeAnima or the Physics. It presupposes some knowledge of Ancient Philosophy and some knowledge of Greek.

Classics 420/567 Ancient Practical Philosophy, seminar: 2 hrs.; J.A. Doull, W.J. Hankey.

Classics 430/560 Seminar on the Philosophy of Aristotle, seminar: 2 hrs.; J.A. Doull.

of the calendar.

Not offered in the period covered by this edition

Classics 432/562 Ancient and Modern Dialeclic, seminar: 2 hrs.; J.A. Doull.

Classics 440/570 Seminar on the Philosophy of the Church Fathers, R.D. Crouse.

Classics 445/564 Medieval Interpreters of Aristotle, seminar: 2 hrs.: J.P. Atherton.

Classics 450/580 Seminar on Neoplatonism, seminar: 2 hrs.; A.H. Armstrong,

Classics 486/586 Departmental Seminar, Seminar, 2 hrs.

This is the beginners' class in the Greek language, and no previous knowledge is required. The aim of this class 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 200 Intermediate Greek, lect.: 3 hrs.; J. Lowry.

Greek 200 is a continuation of Greek 100. The aim of the class is to develop the student's ability and to read and translate prose as well as poetic Greek texts. At the beginning of the class there will be systematic review of Greek Grammar. This will be followed by the reading of texts of Plato, Herodotus and Homer.

Greek 300 Advanced Greek, seminar: 2 hrs., J.A. Doull.

This class which will read both a prose and a poetic work is the normal third class in Greek.

Prerequisite: Greek 200.

Dialectical method in Fichte, Schelling and Hegel in relation to Plato and Aristotle.

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Problems in the theology of Aristotle (God, Creation. Providence) in the interpretations of late medieval authors.

(Not offered in the period covered by this edition of the calendar)

Topics from the history of Neoplatonism and its relation to the theology of the Greek Church will be studied.

Classical Languages and Literature

Greek 100 Introductory Greek, lect.: 4 hrs.; D.K House.

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Greek 301/501 Classical Greek Poetry, seminar: 2 hrs.; A.H. Armstrong, J.A. Doull, R. Friedrich.

A number of poetic texts other than epic and drama will be studied.

Prerequisite: Greek 200.

Greek 302/502 Greek Drama: Tragedy, seminar: 2 hrs.; A.H. Armstrong, R. Friedrich.

A study of Euripides.

Prerequisite: Greek 200.

Greek 303/503 Euripidaristophanizontes: a study of Euripides and Aristophanes, seminar; 2 hrs.; R. Friedrich.

Euripides' Medea and Hippolytos will be studied with the comedies in which Aristophanes attacked the tragedian. The central problem will be the destructive effects which subjectivity had on the ancient world when it entered the polis and the question to what degree Aristophanes was imbued by the very principle which he ferociously attacked in the sophists, Socrates and Euripides.

Prerequisite: Greek 200.

Greek 304/504 Greek Philosophical Texts, seminar: 2 hrs.; A.H. Armstrong, J.P. Atherton, J. Doull.

Prereguisite: Greek 200.

Greek 305/505 Greek Historians, seminar 2 hrs.; A.H. Armstrong, J.P. Atherton, R. Friedrich.

(Not offered in the period covered by this edition of the calendar.)

Prerequisite: Greek 200.

Greek 306/506 Greek Epic Poetry, seminar; 2 hrs.; J. Lowry. A study of Homer.

Prereguisite: Greek 200.

Greek 308/508 Plato and Aristotle on Poetry, Passages from the Republic, Ion, Phaedrus etc. will be studied along with Aristotle's Poetics and literary theory from the Politics and other works. Poetic texts illustrating the theoretical writings will be read. The poetic texts will include the literary dialects and show the relation between them and the genres.

Greek 407/507 Reading and Research, staff.

Latin 100 Introductory Latin, lect.: 3 hrs.: 0 Starnes.

This is an introduction to Latin through the stur of its basic grammar.

Latin 200 Latin Prose and Poetry, lecture discussions 2 hrs.

Prerequisite: Senior matriculation in Latin or Lat 100.

Latin 204 Latin Philosophical Texts, lecthrs.: R.D. Crouse.

The purpose of this class is to give students. perience in reading philosophical Latin. Varia authors will be read from Cicero to the late Mig Ages.

Prerequisite: Latin 100 or Senior Matriculation Latin.

Latin 206 Roman Historians, lect.; 2 hrs.; J Atherton (not offered 1975-76)

Latin 300/500 The Roman Satire, seminar hrs.; M.A. Usmiani.

This class follows the development of Latin sa from its origins to Juvenal. The chief repres tatives of Latin satire that survived are Horacea Juvenal, and a wide selection of their works read and studied thoroughly.

Latin 301/501 A Study of Vergil, seminar hrs.; J.P. Atherton

The purpose of this class is to study the devel ment and importance of Vergil's basic th and ideas that are embodied in the Aeneid. I first part of the class special attention is given his early work the Bucolics, where his the begin to appear, and their development is followed through the relevant parts o Georgics. The main part of the class is devote the reading and discussion of the chief them the Aeneid, especially as they illustrate Ro political, religious and social ideas which greatly influenced our own beliefs and in tions.

Prerequisite: A class in Latin at the 200 level.

Latin 302/502 Roman Comedy, seminar, 2

This class consists of readings of selected P of Plautus and Terence.

Prerequisite: A Latin class at the 200 level.

## classics

Latin 307 / 507 Latin Didactic Epic, seminar. 2 hrs., R. Friedrich

A study of Lucretius' De Rerum Natura and Vergil's Georgica.

Latin 406/506 Reading and Research. staff.

Near Eastern Languages

The classes in Hebrew, Coptic, Syriac and Arabic. are available as electives at the discretion of the nepartment, only in relation to the needs of the narticular student.

Note: The classes in Hebrew and Arabic are taught by the Atlantic School of Theology.

Hebrew

101 Elementary Hebrew and Introductory Readings, J.B. Hardie.

202 Intermediate Hebrew, J.B. Hardie.

303 Advanced Hebrew, J.B. Hardie.

Coptic

101 Introduction to the Coptic (Sahidic) Language and Literature, E. Segelberg.

200 Reading of Selections from other Coptic Dialects, E. Segelberg

301 Selected Coptic Texts, E. Segelberg

402/502 Reading of Coptic Texts, E. Segelberg.

Partly Nag Hammadi Papyri, and partly Manichaean texts.

Syriac

100 Introduction to the Syriac Language and Literature, E. Segelberg.

200 Syriac Language and Literature, E. Segelberg.

reading of some early writers such as Aphrates and Aphrem, the famous hymnographer.

### Arabic

udents wishing to take a class in Arabic must consult with the Department before egistering for the class.

<sup>100</sup> Introductory Grammar and Reading of exts

**Graduate Studies** The department offers an M.A. Programme in classical literature, in ancient history and in ancient and medieval philosophy and a Ph D programme in Hellenic and Hellenistic Studies. For details, see the Calendar of the Faculty of Graduate Studies

### 200 Intermediate Arabic

# 80 comparative literature

## **Comparative Literature**

**Teaching Staff** 

S.A.M. Burns (Philosophy) R. Friedrich (Classics) F. Gaede (German) S. Jones (Spanish) A. Kom. (French) J. Lowry (German) N. Maloff (Russian) R.M. Martin (Philosophy) S Mendel (English) N. Nevo (Russian) N.S. Poburko (English) A. Ruiz Salvador (Spanish) H.R. Runte (French) R. Runte (French) (Committee Head) M.C. Sandhu (French) H.G. Schwarz (German) D. Steffen (German) S. Villani (French) G.F. Waller (English) H.S. Whittier (English)

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.

# 100 Introduction to Comparative Literature

This is an introduction to an 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.

Not offered in the period covered by this calendar.

## 203 Masterpeices of Western Literature, H.S. Whittier

This class is intended to provide the student with the opportunity to do intensive reading of selected major works from Western literature. The intensive reading 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.

Note: This class is cross-listed as English 203.

# 204 The European Novel, S. Mendel

This class is devoted to an intensive study, about a dozen representative European novels the last two hundred years. The method of a proach and the character of tests and examin tions are such as to render it necessary for the student to attend most of the lectures. A co siderable amount of attention is paid to the philosophical ideas which bulk large in many. the novels studied.

Note: This class is cross-listed as English 204 Not offered in the period covered by this calend

## 207 Ancient Drama in Relation to Moden Drama I. R. Friedrich

Greek theatre (production, the Dionysian festive the origins of drama in the Dionysian ritual en and a number of Greek plays by Aeschyl Sophocles, Euripides, Aristophanes, Menander will be studied first; then Plato's g que of drama and Aristotle's defense of it in Poetics, the first systematic theory of drama, T will lead to a study of the influence which Gree drama and in particular Aristotle's theory drama had on the formation of modern Europe drama from the renaissance on. This course open to first-year students.

Note: This class is cross-listed as Classics 207

# 208 Ancient Drama in Relation to Mode 214 Arthurian Romances, H.R. Runte Drama II, R. Friedrich

This class is a continuation of 207. It traces development of modern drama to the 20th a tury. Its various forms and the theories that company them will be studied in comparison ancient drama and in relation to the Aristotel 215 Women in Literature and Society, R. concept of drama. Much emphasis will be lat German and Scandinavian drama (Lessing, Ib Hauptmann, Strindberg, Brecht). In order to m it possible for the student who has not atter 207 to take this class, the results of 207 wi summarized and reviewed during the first 8 sions. This class is open to first-year students

Note: This class is cross-listed as German 208

# 209A Women in Latin America, S. Jones

"Even before the dawn of history, man beca 216 Bertolt Brecht and the Tradition of the ruler of the roost, establishing the design Drama, F. Gaede living that generally prevails today. Everyw even if women are highly regarded, the activ of men are valued more than those of wome of men are valued more than those allocates 217 Faust--a Secular Path to Salvation, J. and tasks between the sexes; those that belon

# comparative literature

men inevitably count for more in the eyes of the whole community. In societies where men fish whole women do beadwork, fishing brings greater and workere women fish and men work with prestige, is beadwork that matters." If this statement is true, then it follows that women's accomplishments have been largely underrated and are due for reevaluation. The class will explore the achievements of women in Latin America and will attempt to assess their contributions objectively.

Note: This class is cross-listed as Spanish 209A.

## 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

Not offered in the period covered by this calendar.

### 212 Realism and the 18th Century English and French Novel. R. Runte

Novels by such authors as Marivaux, Richardson. Prévost, Fielding, Rousseau, Diderot, Smollett and Laclos will be studied. Aspects of realism in style and structure will provide the basis for comparison/contrast of the works read.

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.

Runte and G.F. Waller

A panel of professors will present women as uthors and the role of the woman and her portrait literature as a reflection of society in England and France with appropriate references to Italy and Germany. The development of the woman's age will be studied chronologically with eference to contemporary themes and problems.

Not offered in the period covered by this calendar.

<sup>tot</sup> offered in the period covered by this calendar.

A lecture and seminar class on Goethe's Faust (Parts I/II) -- a literary work in which a total world view is expressed in language both beautiful and appropriate. Students may, if they wish, study independently another work, such as. Homer's Odyssey, Kazantzakis' Odyssee, Mann's Doktor Faustus and Hesse's Magister Ludi (Glasperienspiel) in relation to the Faust test

Note: This class is cross-listed as German 215.

myth.

Through the reading of works by some major black writers such as Mongo Béti, R. Ellison, P. Abrahams, R. Wright, G. Lamming and others, this course will examine relationships between African, Afro-American and Caribbean literatures,

## 237 Restoration and 18th Century Comedy

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 will be studied with a view to defining the universal, national and temporal nature of comic elements in the works read.

### 238 Aspects of Symbolism, S. Villani

A study of the development of "symbolist" and "imagist" expression. Emphasis will be on the literary movement and representative texts of these poets will be examined: Rimbaud, Mallarmé, the "Symbolists," Claudel, Valéry, Stevens, Hopkins, Yeats, Eliot, Ungaretti, Montale.

his is an introduction to some issues in philosophy through the reading of some important literary works. Much modern literature is heavily influenced by philosophical trends; sometimes, in fact, the reader cannot fully appreciate such works unless he has an understanding of the Philosophical issues and traditions in-

### 218 Germanic and Greek Mythology, J. Lowry

All people have myths. Through them they first grasp the origin of the world, the order that govern it and their destiny within it. In this course we will study the two main forms of western mythology-the Greek and Germanic--and the relation of religion and secularism in the modern world to

Not offered in the period covered by this calendar.

Note: This class is cross-listed as German 235.

### 236 Aspects of Black Literature, A. Kom

## 270 Philosophy in Literature, R.M. Martin

### comparative literature 82

volved. The class is designed for two sorts of students: those with literary interests who wish to learn about and discuss some of the more important philosophical influences on modern literature; and those interested in philosophy who would like to investigate literary occurrences of philosophical ideas. In addition to the regular twohour weekly meeting, there will be optional discussion meetings at various times to be announced during the year. Readings may include short works by Dostoyevski, Melville, Kafka, Beckett, Checkhov, Sartre, Camus, Hemingway, Peter Weiss, Brecht, and Margaret Atwood.

Note: This class is cross-listed as Philosophy 270.

## 308 Petrarchanism, G.F. Waller

This class will study Petrarch and Petrarchismo in European love poetry, c. 1450-1650. Students will be expected to read poetry in at least two of the Italian, French and English languages.

Not to be offered in the period covered by this calendar.

## computer science

## **Computer Science**

W. Bitterlich, Assistant Professor (N.S.T.C.) G. Finke, Associate Professor (N.S.T.C.) R. Holmes, Assistant Professor (Math.)

The following classes are accepted for credit. both N.S.T.C. and Dalhousie. These classes taught on the Dalhousie Campus.

## 240 Introduction to Computer Science, lea 3 hrs.

Comprehensive Fortran class with selected at Associate Professors plications from various areas. History of computer M.G. Brown tion, number systems and coding. Description RL. Comeau computer systems, logical design. Introduction, P.B. Huber machine code with exercises in Compass. Ra E Klein dom numbers and simulation. Elementary seam C.T. Marfels and sort methods. Complexity of algorithms, ULG. Rao troduction to further high-level languages emphasis on Algol and Apl.

Prerequisite: Mathematics 101 or 110, or cons of instructor.

## 335 Data Processing, lect.: 3 hrs.

Review of Fortran. Basic concepts of data. Arran K. Nishimura lists and strings. Storage allocation. Fir TA Pinfold management, updating, searching, merging a sorting. Report generators. Cobol programm special Lecturers with applications to payrolls, accounting, set M.P. Gardner analysis, business statistics and inventory or A.S. Harvey trol. Simulation of industrial processes. Mana: K.S. Wood ment games.

106.

## 340 Computer Science, lect.: 3 hrs.

precision arithmetic. Implementation of mat Price Indexes, Seasonally Adjusted Unemploymatical functions. Combinatorial and enumement Rates ...? tive algorithms. Random number generation transformations.

Data structures. Lists, strings, anays and external of interested in studying the economic Storage media and allocation. Symbol tables, system of Canada in contrast to that of Russia, dating and searching. Core sorting algorith rugoslavia, Great Britain, or Argentina? and external sorting and merging. Compute Are you interested in studying the international multi-programming and time-sharing.

Introduction to selected advanced topatrica, Asia, and Latin America? Introduction to selected advanced perhaps you are interested in studying probtern recognition and picture process ems of regional development in Canada, Elements of abstract languages and compile

Prerequisite: Computer Science 240.

# economics

# Economics Professors J.L. Cornwall B.E. George

- LF. Graham J.G. Head Z.A. Konczacki BL McAllister (Chairman)
- N.H. Morse
- A M Sinclair

Assistant Professors

F.M. Bradfield ML Cross Dauvergne MR Hodson

R Lesser

G Kartsaklis

J. Schulman

Prerequisite: Computer Science 240 or Commer Do you know why unemployment should be a matter of national concern?

> Do you know the price that Canada will pay for a clean environment?

Do you understand your newspaper when you Algorithms. Basic concepts, single and mi read about Gross National Product, Investment,

> re you interested in studying problems in the economics of labour?

Data structures. Lists, strings, arrays and tre Are you interested in studying the economic

chitecture. Operating systems. Batch process monetary system and patterns of trade between untries? Are you interested in studying the nomic problems of the emerging nations of

adian economic history, or problems of the adian urban scene.

of this, and more, is economics.

Economics can be taken as the major subject in a general B.A. or B.Comm. degree programme, and it may also be taken in conjunction with major programmes in subjects such as mathematics. accounting, political science and history.

The necessary core courses for a major in Economics are: Economics 220 (A or B), Economics 221 (A or B), and Economics 222 or 228.

As a guide to the student who is majoring in Economics, the following outline represents a course structure for a typical well-rounded programme.

### **Recommended course Structure** Yearl

1. Economics 100, 110 or 120. 2. Mathematics 110, or equivalent. 3-5. Three classes chosen from fields other than Economics.

Year II 6-7. Economics 220 (A or B); Economics 221 (A or B). Economics 222 or 322. 8. One other class in Economics. 9-10. Two classes chosen from fields other than Economics.

Year III 11-13. Three classes in Economics. 14-15. Two classes in least one of which is not in Economics.

Economics will provide you with a body of theory that equips you to deal with such questions and applied courses in economics permit you to study any of these questions in detail. The offerings in Economics allow considerable breadth and variety in order to accommodate a variety of interests on the part of students. Students will find that they can major in Economics exclusively or that economics goes hand in hand with work in sociology, political science, or biology. Students who wish to gain a more intensive and broader knowledge of economics may want to take the Honours Programme

Students graduating in economics find many well-paid and interesting opportunities for employment in teaching, research and administrative positions in universities, business, government and international organizations

### General Degree Programmes

The Department offers undergraduate and graduate programmes in economics. Students should consult the timetable and the Department at the time of registration for changes in or additions to the classes listed here.

Students considering economics as an area of concentration should consult the Department about their programme.

Although students may offer fewer classes in economics than the seven suggested, this number is deemed necessary to provide a basic knowledge of the discipline and should be regarded as the minimum for preparation for a graduate programme in economics.

Students must satisfy the overall requirements for the degree programme in which they are registered. (B.A., B.Com., B.Sc., etc.)

## Ghana Programme

Dalhousie Economics Department and G.I.M. P.A., Programme for Planning, Project Management and Finance Officials of the Government of Ghana.

R.K.O. Djang, Coordinator-Ghana

M. Gardner, Ghana Project Administrative Officer

R.E. George, Coordinator and Team Leader in at Dalhousie

Ghana R.I. McAllister, Coordinator-Canada

D. Pickard, Dalhousie Financial Advisor in Ghana A.M. Sinclair, Advisor-Canada.

At the request of the Government of Ghana and funded jointly by the Canadian International Development Agency and the Ministry of Economic Planning, Government of Ghana, the Department of Economics, Dalhousie has developed a series of courses in cooperation with the Ghana Institute of Management and Public Administration, Ghana. These courses are run at G.I.M.P.A. on the outskirts of Accra for officials in ministries and corporations with responsibility for planning, project and programme management, financial planning. In addition appropriate overseas senior management training has been organized through this programme at such agencies as the Federal Business Development Bank and Treasury Board, Government of Canada and Economic Development Institute, World Bank, Washington (in this last case funded by the E.D.I.).

A substantial cadre of experienced officials from the Government of Ghana, International Development Agencies and Canadian Government Agencies and Departments participate in various instructional phases of the programme. Considerable emphasis is on field projects in Ghana. For further information, contact Mr. Michael Gardner.

## **Concentrated Integrated Programme**

The Department is now offering an alternative course structure which may be of interest to students who wish to prepare themselves for a two-year M.A. programme or for work as an

economist. The Concentrated Integrated gramme differs from the normal course of st since students will work on the one class time, rather than the usual five, during either second or third year. In other words, the year sists solely of a set of economics classes take sequence rather than in parallel.

Students who are interested in applying to en the programme in September 1976, or who wish find out more about it, should contact the Dep ment of Economics before April 30, 1976. The gramme is designed for a maximum of students and a minimum of 10 students.

## African Studies Programme

The Department is cooperating with several on Departments in offering an African Studies gramme. Interested students should contact fessor Z.A. Konczacki.

## Other Programmes

The Department is prepared to assist stude who may wish to devise their own program under the present curriculum regulations. terested students should consult Undergraduate Co-ordinator.

Honours Degree Programme

Degree in Economics are: Economics 100 or Economics 220 (A or B); Economics 221 (A or Economics 320A; Economics 321B; Econom 228; Mathematics 110 or equivalent; a cours Economic History; a course in the Histor Economic Thought.

The following course structure is recommend

Yearl

1. Economics 100 or 110. 2. Mathematics 110 or equivalent.

3-5. Three classes in fields other than Econor

### Year II

- 6. Economics 220 (A or B) and 221 (A or B). 7. Economics 228.
- 8. Economics 232 or other economic

9-10. Two classes chosen from fields other Economics.

## Years III and IV

11-16. Six economics classes including 327,3

sultation with the Department.

The student's programme will be chosen in approval of the Department.

# economics

amination at the end of their fourth year, or write a series of short papers, at their option.

of the classes selected outside of economics in of the third and fourth year, students must include at the time classes above the elementary level.

Students are advised that mathematics is reguired for graduate work in most good graduate schools. The value of econometrics and of additional mathematics is therefore 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 be careful in arranging 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. For combined honours programmes with economics where the major concentration is in the other discipline, students should consult the other departments concerned.

### Classes offered

The necessary core courses for an Hone 100 Principles of Economics, lect. 2 hrs., tutorial 1 hr., various members of staff.

> This class serves as an introduction to economics for students and with no previous background in economics, and can be taken as the first in a series of classes in economics or as an elective for students wishing some background in the subject. The emphasis in the class is on developing the basic analytical tools and applying them in the context of contemporary, and generally Canadian. economic problems. Sections 5 and 6 of Economics 100 differ in offering a problem oriented framework in which the analytical tools are developed by examination in each term of a question such as the multinational firm in Canada, uran economics, Canadian government and the economy, and the economics of inflation.

Principles of Economics: A Mathematical Approach, lect.: 2 hrs., tutorial hrs., T. Pinfold.

his is an introductory class for students with a 321B. 17-20. Four classes in other areas chosen in background in mathematics. Similar to Econo-<sup>cs</sup> 100, the class is designed to provide a eral introduction to economic science and to troduce students to the way in which economic sultation with the Department and must have analysis can be applied to resolve economic prons. However, the approach taken to the alerial will be more rigorous. Mathematical Honours students must pass a comprehensive cols will play an integral role in developing the

economics.

employed.

In addition to standard topics such as consumer and producer behaviour under various market structures, an introductory treatment of general equilibrium, external economies, and welfare economics is included. Although the major emphasis is on theoretical ideas, applications of these ideas are considered, in order to illustrate the range and power of micro-economic theory in dealing with practical economic issues.

Prerequisite: Principles of Economics.

This class is intended to provide a sufficient treatment of macro-economic theory to serve as a basis for other classes in economics which reguire a knowledge of macro-economics. The class is not mathematical in its treatment of the material. Topics covered include: national income accounting; the theory of employment, interest, money, and prices; and the theory of economic growth. Both "open" and "closed" economies are considered. Major emphasis is placed on the development of the theoretical ideas.

theorems and proors. A knowledge of differential calculus would be helpful.

120 Principles of Economics: An Historical Approach, lect.: 2 hrs., tutorial 1 hr. B. Lesser,

This course will analyse a number of episodes from Canada's past as a means of illustrating and developing the principles of economic analysis.

Episodes 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 will be examined as a means of developing the basic analytical principles of

Note: Economics 120 is not open to Commerce students needing to satisfy their Economics 100 requirements.

220A/B Micro-Economic Theory I. lect.: 3 hrs.: (offered both terms).

Microeconomics 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 with the behaviour of groups of household and firms. This class covers material in this area which may be required for other classes in economics at the 200 to 400 level. Geometry and a limited amount of high-school algebra are

221 A/B Macro-Economic Theory, lect.: 3 hrs.; (Offered in both terms).

Prerequisite: Principles of Economics.

222 Economic Statistics I (same as Commerce 204), lect.: 3 hrs.; workshop 2 hrs.; R.E. George.

Topics studied include the definition, functions and sources of statistics; the design and execution of statistical enquiries; statistical tables; graphs and diagrams; measures of central tendency, dispersion, skewness and kurtosis; curvefitting; probability (estimating mean and proportion in population from samples, and testing hypotheses about means and proportions); quality control; index numbers; time series analysis; elementary correlation.

Background knowledge that is essential for this class includes: algebra at approximately Grade XI level; some experience of constructing and interpreting graphs; the ability to think quantitatively which is usually gained by the study of geometry and algebra at the high school and university level; familiarity with national accounting concepts.

## 228 Intermediate Statistics, lect.: 3 hrs.; U.L.G. Rao.

The student who is familiar with the basic statistical theory can appreciate econometric technique better than one who has had a formal training in statistics, which involves training in computational aspects of statistical measurements but which does not give the student any understanding of fundamental theory. The purpose of this class is to equip the student with the basic theory of mathematical statistics. Statistics in its applied form has become a basic tool in all fields; recently, statistical techniques, suited to tackle economic problems, have become increasingly sophisticated. This class is designed as an introduction to econometrics; it is presumed that advanced technques of econometrics can be understood by the student who has taken this class.

This class concentrates on the theory of Probability, building from an axiomatic point of view, mathematical expectation, moment generating function, and statistical inference.

Multiple linear regression models will be discussed and a critique of various problems that arise consequent to violations of the assumptions of the general linear model will be presented. This will prepare the student to undertake applied econometric work; besides, it would provide a springboard for the student to take up advanced econometrics.

The student is expected to have at least a year class in calculus (Mathematics 110 equivalent) and preferably linear algebra too troductory Economics is also required.

## 231B Health Economics, lecture seminar, 3 hrs.; M.G. Brown.

This course examines the allocation of resource to and within the health care sector of economy. Characteristics claimed to be unique the health care sector are analysed within economic framework. Determinants of dema supply and utilization of health services are amined with particular reference to the organ tion and evolution of Canada's health system.

This one-term survey course consists of literature review, lectures, and student sem presentations on selected topics. To commodate part-time student the class will m during late afternoon or evening one day week.

Prerequisites: Principles economi of Economics 220A/B is desirable.

## 232 Canadian Economic History, lect.: 31 (same as History 222); N.H. Morse.

This survey is development of Canada from age of discovery to the present. However Canada from the beginning has formed par larger system, the approach taken in the cla to present Canadian economic history in rela to the larger system which can be br described and analyzed in terms of the rela ships between the Old World and the New. class therefore covers areas of economic h that are considered to be relevant t understanding of the economic development Canada. The aim is to make the class a u much as possible by using themes of trade, modity, technology, vested interests, institute breakup or change in empires, the sh balance of power between countries and rea the role of the Caribbean areas, the rise of No prerequisites are required, although Introduc-Canadian responses to these changes and desirable ternal problems as well.

class than is used in the earlier parts, as Huber. theory is helpful in discussing Canadian

# economics

lems and policies, especially in the twentieth century. However, no strict prerequisites are reury. Although a class in economic principles and some knowledge of history would be beneficial.

234A Pre-Colonial History of Sub-Saharan Africa, lect.: 2 hrs.; Z.A. Konczacki.

The object of the class is to introduce the student to the most important problems of African economic history, with particular concentration on the pre-colonial period, and to prepare him for further reading in this area of study.

The topics considered include: methodology of African economic history; the significance of environmental differentiation; some speculations on economic prehistory; economic contacts between distinct ecological regions and different cultures; introduction and spread of agricultural crops; landholding systems; mining and metalworking; long-distance trade routes and trade centers; overseas trade; slavery and slave trade; Arab and European penetration and its economic impact.

The discussion concentrates primarily on tropical Africa and it is carried up to the times of the partition of the Continent by the European powers in the late nineteenth century.

No prerequisites are required, although Introductory Economics and some knowledge of history is desirable.

235B Economic History of Tropical Africa: Colonial Period, lect.: 2 hrs.; Z.A. Konczacki.

This class deals with an era which began with the "scramble" for African colonies, and ended with the coming of independence. A survey is provided of colonial economic policies, prior to World War II, problems of their implementation and eventual introduction of the "development and welfare" approach. More specifically, the topics discusses and so forth, as a means of developing the include: development of of transport; mining; ment. As the class proceeds, the focus s agriculture and trade; some aspects of investmore and more towards Canada, but the get ment and technological diffusion; growth of subject matter deals with the penetration of labour force and the problems of migrant workers; peans coming from across the Atlantic colonial planning; socio-economic impact of across Siberia into the Western Hemisphere European colonization on Africans; African class therefore is a study in the formation response to economic incentives; a balancesheet of colonialism.

United States to a position of pre-eminence lory Economics and Economics 234A are

<sup>241A</sup> Comparative Economic Systems: Na-More theory is introduced toward the end lional Economics, seminar: 2 hrs., P.B.

### 242B Comparative Economic Systems: Economic Organization and Planning. seminar: 2 hrs., P.B. Huber.

Initially, this class examines the economic behaviour of organizations and the ways in which this behaviour can be controlled. This provides the basis for consideration of the theory and practice of economic planning at micro-economic and macro-economic levels in various institutional contexts. Readings include selections from Dahl and Lindblom, Galbraith, Mishan, Tinbergen, and Ward.

Prerequisite: Introductory Economics, plus an additional half-class in Economics.

Content. The class has three main components. which often run concurrently. They are:

1. Economic Development in Practice. An appraisal of key lessons from the development experiences of a selection of countries and regions. including the Atlantic Provinces. The purpose of this selection will be to give perspective. Often the development problems and programmes of regions and countries are viewed as unique; in practice they are frequently monotonously similar, but inadequate attention has been paid to investigating comparative experiences and so the same mistakes are unnecessarily and expensively repeated.

The object of this class is to sharpen the student's ability to think about problems of economic organization and control, to improve his skills in writing and speaking with respect to these problems, and to provide him with a broad background of institutional material on the structure and performance of a variety of economies. Reading on specific countries provide the basis for several short papers, but there is no written examination.

The student taking this class must understand the interrelated character of economic activity and have a good grasp of the way in which the price system operates. Preliminary reading should have included The Making of Economic Society by R.L. Heilbroner.

Prerequisite: Introductory Economics.

250 Applied Development Economics. seminar: 2 hrs. and tutorials. R.I. McAllister.

Purpose. This class enables participants to review some key lessons from economic development theory and comparative country and area experience, and to apply elements of this background in tackling case studies and current development problems in project teams.

2. Development Plans, Strategies and Programmes. Particular attention will be given to the utilization of Canadian case studies undertaken by the class participants, balanced by lessons from the experiences of agencies such as the World Bank, in order to strengthen the class participants' own appreciation and capability as to how they could themselves be effective members of planning, programme and project teams.

3. Projects and Development. The cutting edge of many development plans and programmes is the development project - be it a steel mill, fish plant, container port or training programme. Through field work and the use of case material, participants will be taken through the project cycle and introduced to the strengths and limitations of such techniques as cost-benefit analysis, criticalpath scheduling and planning, programming, budgeting systems. As a consequence, the participants will rub shoulders with project personnel with a range of disciplines including engineering, law, economics, accounting, sociology, and management skills. The focus will always be on 'doing the task' and not simply on talking about it.

### Class Membership

The class is provided for two main groups of people:-

1. Students interested in applying their background in economics and related subjects (e.g. political science, commerce, sociology) in a working environment, as part of a team that will include colleagues who already have some experience of development economics in practice.

Persons who are presently working in government agencies and business, who have an interest in reviewing how they might learn from comparative development experience lessons of value to their present, or future, work situations.

Prerequisites: Introductory Economics in all cases. For those taking the class at the 440 and 532 levels, either substantial additional economics or a background in political science, business and public administration, sociology, engineering or law are required.

Resources. Experienced advisers from government and private agencies will add further perspective and guidance by participating in some aspects of this class.

## 320A Micro-Economic Theory, lect.: 3 hrs.; G.A.B. Kartasaklis.

This class is mainly concerned with the theory of the firm. The discussion centers around managerial motivation and the equilibrium of the firm in theory and practice. Selected topics include the alternatives to profit maximization,

break-even charts, cost-plus pricing, and the ing of factors of production. This is followed discussion of problems of market conduct un oligopoly: collusive behaviour, administer prices, and basing-point prices are the ma issues in this part. The last part of the cla covers problems of resource allocation and welfare economics. This class will be of particular value for students intending to do graduate w in Economics. A knowledge of calculus would useful.

Prerequisites: Mathematics 110 or equivalent Economics 220A/B which may not be taken on currently.

## 321B Macro-Economic Theory, lect.: 3 hr G.A.B. Kartsaklis.

This is a class for persons who wish to do relation ly advanced work in economic theory, possi with the thought of going on to do graduate w in economics. The class will assume some knowledge of calculus. Topics covered inclus classical models of income and employment Keynesian models of income and employment the theory of economic growth (including the sector models); and trade cycle models.

Economics 221A/B Prereauisite: Mathematics 110 (or equivalent).

## 324 Public Finance, lect.: 2 hrs.; tutorial 1 J.G. Head

Economics 324 is concerned with the princip of public finance and their application. The part of the class deals with the objectives public policy and the reasons for market fail This section provides the elements of a theor public expenditure which is illustrated reference to the major economic functions government.

The second part of the class is concerned the theory of taxation in relation to the object of public policy. This section explores the p ble role of a sample of important taxes in design of a good tax system. The third section amines the role of public finance in relation economic stabilization. The final section of siders the special problems of public finance federal system. The analysis of the various tions will be illustrated from and applied to fiscal systems of Canada and other countries.

Prerequisite: Introductory Economics, nomics 220A/B and 221A/B are desirable.

325 Labour Economics, lect. and semina liveness of monetary policy. hrs.

# economics

some nine million Canadians are directly depensome time wages and salaries for a living, and dent upon angle constitute about 65% of the National income. Over two million of these workers belong to trade unions in critical sectors of our economy. Economic analysis of the factors affecting wages and salaries, employment and unemployment, the conditions of labour, and the abour market is therefore important to an understanding economy as a whole.

The subject is introduced by reviewing: the emergence of the labour problem; the development and structure of the labour market; the growth, structure and outlook of trade unions; and the historical and legal foundations of labour relations.

Most of the year is spent in:

(a) Analysis of the supply of and demand for abour, opening with a review of classical wade theory.

(h) Examination of the theory and practice of collective bargaining, exploring also the interaction and relative strengths of market (economic) forces, and institutional (government-unionemployer) forces.

(c) Study of labour's share of the national income and the relative effect of unions on it.

(d) Analysis of the determinants of employment in the macro-economic sense, and of the measurement and problems of unemployment.

We conclude with a review of public policy with respect to labour, and an effort is made throughout to relate current events to the theoretical framework.

The class structure is intended to be flexible: however, as a base it has two lectures and one seminar (in which student teams of four each provide the materials) each week.

Prerequisite: Introductory Economics and an interest in social science and its methods. Economics 220A/B and 221A/B are desirable.

326A Money and Banking, lect.: 3 hrs.; R.L. Comeau.

This class is concerned with the nature and operation of the financial system, with particular reference to Canadian examples and experience. As such the class is concerned with financial instruments and institutions and with those processes whereby the social control of the supply of money and credit in the system is effected. The class is complete in itself, but is complemented <sup>by</sup> Economics 426B which continues the analysis with a consideration of the theory and effec-

The approach taken in this class is to study "the intellectual efforts that men have made in order to understand economic phenomena" A brief survey of mediaeval and mercantilist literature is followed by an examination of English classical political economy and Marxian economics together with that of other socialists. The focus then shifts to the marginalists, neo-classicists, and the institutionalists. Problems of economic instability and depression, especially in this century, require that some attention be given to Keynesian economics and its extensions. The time allotted to the study of European writers and schools and of various contemporary writers and current topics depends in part on the interests of students. It is recognized that the tremendous expansion of the literature and the emergence of highly specialized fields in economics makes it necessary to select from recent sources only a relatively small sample of writings which relate this class to others which the student may be taking. The links can be forged, nevertheless, by means of a number of topics such as the following: the theory of value, the treatment of money, the theory of economic growth, the theory of distribution, and the relationship between growth and distribution.

Marfels.

Prerequisite: Introductory Economics: nomics 221A/B is desirable.

Eco-

### 327 History of Economic Thought, lect.: 3 hrs.: N.H. Morse.

Although this class is intended to supply a background for several other classes in economics, it is also true that other classes serve as background for this one. It is considered essential, however, that students in this class have taken a class in economic principles. A class in micro-economics (price theory) and in macroeconomics (income determination) would be helpful. The presentation, except for a few specific points, is largely non-mathematical. Therefore, the main requirement of students is an. ability to read and assimilate a certain body of literature rather quickly.

Prerequisite: Economics 220A/B and 221A/B are recommended.

# 328 Industrial Organization, lect.: 2 hrs.; C.

Industrial Organization is the application of the models of price theory to economic reality. In a specific industry, the problems of a firm competing successfully with its rivals in order not only to survive but to acquire a higher market share are far more complex than those in price-theory

where we have to deal with more or less simplified assumptions to find a solution at all. The traditional approach to the analysis of the competitive process in an industry is divided into three parts: market structure, market conduct, and market performance. These are the three main parts of the class.

Briefly, market structure refers to the number and size distribution of firms in general and to economic concentration in particular; in market conduct the pricing process is discussed; market performance concerns the problem of the degree of optimality of allocation of resources. The latter part includes a discussion about whether a reallocation of resources is necessary, and this involves looking at the basic elements of public policies directed towards business.

Prerequisite: Economics 220A/B or equivalent micro-economics course.

329 Urban Economics, lect.: 3 hrs.; T.A. Pinfold.

Urban Economics is essentially the application of tools of economic analysis to the problem or urban areas. Urban area is loosely defined so as to include small towns as well as large cities. Topics discussed include: the origin of cities, factors affecting urban economic growth, the goals of an urban area, problems in intra-urban resource allocation, urban transportation, production of public goods in urban areas, and urban planning. Flexibility in selecting class content is considered important. Topics suggested by students are welcome. Students are expected to present papers on topics of their choice.

Prerequisites: It is strongly recommended that students have a sound background in both macroand micro-economics. Economics 220A/B and 221A/B, or their equivalent would be a minimum. The class is designed as an application of theoretical tools. No theory will be taught. Students will also find a knowledge of calculus useful, but not necessary. If a prospective student is unsure about the suitability of his background, he should consult the instructor.

## 330A International and Interregional Exchange, lect.: 2 hrs.; A.M. Sinclair

This class considers the causes of international and interregional exchange of goods and services and analyzes the effects of international integration on the incomes and growth rates of national economies. 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. Depend-

ing upon class interest and availability of the the subjects of economic integration and of Ca dian commercial policy may be discussed some detail.

Prerequisite: Introductory Economics 220A/B.

## 331A Economic Development: An Environ ment Approach, lect.: 2 hrs.; Z.A. Konczacki

The approach taken in this class reflects economist's view of the relationship between vironmental questions and his own discipline The main emphasis is on the problems of the dustrial countries. Topics considered include p causes of the environmental crisis, an introdution to the general systems theory and some prolems of research methodology, the measurement of costs and benefits, policies for environment protection, the implications of a steady sta model and the relation between econom development and eco-systems in the less and the more developed parts of the world. This class m vides a general background for Economics 3328

Prerequisites: Introductory Economics. Economics. nomics 220A/B, 221A/B and 333A are desirate Students may also be admitted by permission the instructor.

## 332B Resource Economics, lect.: 2 hrs.; NF Morse.

This class is concerned with an analysis of physical and economic characteristics of rent able and non-renewable resource industries a of environmental philosophy. Selected a studies of resource management in Canada a elsewhere will be discussed.

Prerequisites: Introductory Economics. nomics 220A/B, 221A/B and 331A are desirable

333A Theories of Economic Developmer lect.: 2 hrs., Z.A. Konczacki.

The purpose of this class is to provide theoretical framework for the understanding the process of economic development in more and the less developed countries wi view to an eventual application of this framew to the solution of practical problems.

Topics considered include: basic definitions distinctions; measurement of economic m tudes; characteristics of the less developed of tries; selected theories and models of econ development and their appraisal. The conclu-

# economics

seminars are devoted to the problem of the foundations of the theory of economic development. and of distinction between the concepts of unilinear and multilinear evolution is discussed.

prerequisite: Introductory Economics. A class in macro-economics equivalent to Economics 221A/B, and History of Economic Thought is desirable.

336B Regional Development, seminar 2 hrs.: and tutorials; R.I. McAllister.

This class enables students to examine the process, prospects and problems associated with regional development in Canada in particular and in the more industrialized countries in general. the interdependence of economic, political and social forces is markedly in evidence in the evolution of regional policies, and while this class will he oriented largely from a concern with the economic forces underlying the process - these other factors will be taken into consideration. The approach will contain main elements: (a) the apnlication of economic 'principles' in the context of regional development; (b) a comparative review of regional development experiences and policies of a number of industrialized countries; (c) Canadian regional development experiences, with particular focus on the Atlantic region; (d) regional field case study; each student will examine the hackground and the role of one pertinent project such as D.E.V.C.O. in Cape Breton, the Newfoundland centralization program, the Saint John multi-industry complex. The class will visit several such projects over the period.

Prerequisite: The class is intended very largely for graduates (not necessarily in economics), who already have a number of years work experience on problems associated with regional development. A limited number of other students (with a substantial background in economics and/or political science) will be admitted.

337B Recent Economic Developments in Sub-Saharan Africa, lect.: 2 hrs.; Z.A. Konczacki.

This class centres on the last decade of development. Topics discussed include: impact of colonial heritage, present structure of African economies, infrastructure, agriculture, mineral development, industrialization with particular emphasis on import substitution, trade: overseas and intra-African, foreign investment and aid programmes, economic planning, and the prospects or the future of development and co-operation between African economies. This class cannot be taken by the students who already have a credit in

A review of the general linear model will be made. Violations of the assumptions crucial for least squares estimation brings in various problems. The following problems will be discussed in detail: Stochastic regressions, generalized least squares, autocorrelation, heteroskedasticity, distributed lags and dummy variables. All these problems are single equation problems.

Monte Carlo methods as alternatives to analytical techniques will be discussed. This class requires a high level of work. Minimum prerequisites will be an undergraduate statistics course and undergraduate work in micro- and macroeconomics. The prerequisites are Economics 220A/B and 221A/B and Economics 228.

## Economics 340B Models of Communication and Transportation, seminar, 2 hrs.; P.B. Huber

The influence of space and time as well as the interpersonal interaction involved in communication introduces modifications into microeconomic demand and supply models in these industries. In addition regulation imposes constraints. This class reviews some of these issues, and time permitting, also examines cost and benefit calculations in these industries.

Prerequisites: Economics 220A/B and 221A/B.

Comeau

Economics 236A or B.

Prerequisites: Introductory Economics. Economics 234A and 235B are desirable

### 338 Econometrics, lect.: 3 hrs.: U.L.G. Rao.

This class attempts to introduce econometric theory at a fairly advanced level and is designed mainly for one who likes to work on theory or model búilding.

Simultaneous equation problems occupy an important place in econometric model-building. A critical analysis of the problem of identification and single equation bias will be made.

Limited information methods and full information methods of estimation will be discussed.

426B Monetary Policy, lect.: 3 hrs.; R.L.

This class assumes that students have a basic knowledge of monetary institutions and macroeconomic theory and develops out of this a critical analysis of the objectives and effec-

tiveness of monetary policy, with particular attention to Canadian experience. The class reviews the instruments of monetary control and the theoretical framework of monetary policy and then considers the effectiveness of Canadian monetary policy in recent years.

Prerequisites: Economics 221A/B. It is advantageous for students to have completed Economics 326A as well.

Economics 431B International Payments, seminar: 2 hrs.; P.B. Huber.

Selected topics in recent international monetary history are examined, the causes of and remedies for external inbalance 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.

A substantial proportion of class time is devoted to the discussion of papers prepared by students. A comprehensive reading list is distributed.

Prerequisites: Economics 221A/B and Economics 330A, or Economics 220A/B and Economics 326. Albegra and geometry and limited amounts of calculus are employed.

## 432 Regional Economics, seminar 2 hrs.; F. M. Bradfield.

This class analyses why economic growth tends to be differentiated regionally. A variety of growth theories are examined, followed by a discussion of empirical efforts and an assessment of them from the various theoretical points of view. The final part of the classwork involves policy discussion and the presentation of seminar papers. The basic goal of the class is to provide the student with some framework for understanding the reasons for the development of regional problems. The focus of the discussion is on the underdeveloped regions of developed nations although the issues discussed are different more in degree than kind from those of underdeveloped nations.

Prerequisite: Economics 220A/B and 221A/B. Students must have a knowledge of both macroand price theory, especially the market mechanisms determining factor flows and the production relationships between factor prices, productivities and proportions.

433B Intergovernmental Fiscal Relations, lect., and seminar, 2 hrs. J.f. Graham.

This class is concerned with the principles of in tergovernmental fiscal adjustment and their an plication in a federal political system, particular Canada, at both federal-provincial and provincial municipal levels.

Prereguisites: Economics 220, 221, 32 Economics 324 may be taken concurrently Political Science 3220A and 3221B are recom mended, though not required. Students may also be admitted by permission of the instructor.

440 Applied Development Economics seminar: 2 hrs. and tutorials; R.I. McAllister

For description see Economics 250.

446A Utilitarianism, Classical Liberalism and Democracy (Seminar in Philosophy) Politics, and Economics), 2 hrs., D Braybrooke.

(Same as Philosophy 447A and Political Science 4479A. Offered in 1977-78).

448A Social Choice Theory (Seminar in Philosophy, Politics, and Economics), 2 hrs D. Braybrooke.

(Same as Philosophy 448A and Political Science 4480A. Offered 1978-79).

449B The Logic of Questions, Policy Analysis, and Issue Processing (Seminar i Philosopny, Politics, and Economics), 2 hrs D. Braybrooke.

(Same as Philosophy 449B and Political Scient 4490B. Offered 1978-79).

## **Graduate Studies**

The Department offers a graduate progran leading to the M.A. and Ph.D. degrees. Details these programmes, including a list of gradua course, are given in the Calendar of the Faculty Graduate Studies. Senior undergraduates may admitted to some graduate classes at the discre tion of the instructors concerned.

# english

## English

Professor Emeritus C.L. Bennet

Professors A.R. Bevan (Chairman) J. Fraser I Gray M.G. Parks M.M. Ross S.E. Sprott D.P. Varma

Associate Professors

S.A. Cowan B MacG. Dawson A J. Hartley MA Klug S. Mendel R.J. Smith G.F. Waller HS. Whittier

**Assistant Professors** R.S. Hafter

A Kennedy P. Monk H.E. Morgan C.J. Myers N.S. Poburko RL. Raymond H.D. Sproule J.B. Stovel R.R. Tetreault

Lecturer R.M. Huebert

> **Killam Senior Fellow** G. Wickham

Part Time Instructors E. Horlock E. Sutherland

Post Doctoral Fellows T. Brownlow R. Hillman

The study of English literature at Dalhousie is not just the study of the literature of England. To be sure, it is largely concerned with the rich written heritage of the British Isles, but ranges far beyond their shores to include the study of writing in Canada, the United States, parts of the Englishspeaking Commonwealth and indeed, some European countries, in translation.

It ranges widely in time, too, from early Anglo-Saxon works of the eighth century through thirleen centuries of changing ideas and language to the still-changing thoughts, feelings and expres-

sion of the 1960s and 70s. 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 in the values and ideas that they embody.

In the first year, English 100 is required by all students who wish to take further English classes. There are some twenty different sections ranging from historical surveys to more specialized studies of periods or themes. To enable students to choose the one most suited to their inclinations and needs the English Department and the Registrar's Office have an English 100 supplement which includes the aims and reading lists of each section. Only under unusual circumstances is exemption from English 100 grated.

Classes numbered from 200 to 231 are especially suited for students who are 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.

As soon as possible in the academic year, each student who intends to concentrate on English is given a Faculty Advisor who will aid in the arrangement of a programme to suit individual interests. All students in the study of the English language and literature should notify the Department of this interest in order that this Advisor may be assigned.

Indeed, 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 himself 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 the student to his own best expression.

### **Faculty Advisors**

Degree Programmes

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Students should consult with their Faculty Advisors about their choice of classes. The Department expects General students to form coherent programmes of four to eight classes in English 100. Students should note that:

(1) of the classes beyond English 100 required to constitute a programme in English for the general B.A. degree, not more than three should be drawn from any one of the following three groups of

### classes: (a) 203, 214, 218, 224 (b) 206, 208, 215, 216 (c) 209, 212, 213, 217, 301

(2) classes numbered from 201 to 231 (excepting 201, 206, 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 his concentration and has attained at least a second-division average in them.

# The B.A. with Honours in English (Major Pro-

The Honours course in English offers a systemic study of the subject which acquaints the student with 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 Honour 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 50C and 51B) beyond English 100. At least one class must be taken from each of the following six sections:

Section A. English 252 (recommended for third vear) 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 453; English 455

The student may choose his three remaining classes from those not already chosen in Se tions B to F, or from Section G. Section G. English 201, 206, 207, 357, 218, 454

English 50C (Bibliography) and English 0518 (Practical Criticism), non-credit classes which meet one hour per week, are required of all Honours students and are to be taken in the first year of the Honours course. (See page 36 fm details.)

The Honours student must meet the require ments for the General B.A. degree. He is advise to select a minor from one of the subjects lister under either Group A or Group B in the "degree and Courses" section of the Calendar.

## B.A. with Combined Honours

There are several Combined Honours program mes:

English and French English and German English and History English and Philosophy English and Spanish English and Theatre

Students interested in any of these combination or any other that involves English and anoth subject should consult with the Departments con cerned.

A Joint Honours programme, involving operation between the Departments of English Mount Saint Vincent and Dalhousie, has be established.' Students interested in this p gramme are advised to consult the Departme for further details.

## Classes Offered

## 100 Introduction to Literature, lect.: 3 h Members of the Department.,

Since English 100 consists of sections taught many different instructors, statements about objectives and approach must be confined generalizations. All instructors of English have these two broad objectives in common: (a) to involve the student in the serious study literature as a crucial part of education; (b) to involve him in the discipline of words so he will be a more critical and responsive rea and a more exact and imaginative writer.

The subject matter varies from section to sech Detailed syllabi of all sections are available. P Detailed syllabi of all sections are dynamic 206 American Literature of the Nineteenth fortnightly essays.

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Fach section attends three lectures per week. In Each section attached to each session conaddition, indiscussion groups and personal interviews with students.

### **Classes for General Degree**

cor a more complete description of classes and of For a life students should consult the Departmental supplement for Upper-Year classes.

(Tentative List)

2011 The English Language, lect.: 2 hrs.; N.S. Pohurko.

This class is not prerequisite to, but is useful as an introduction to, English 253 and 351 (Old and Middle English).

202 History of the English Language. Lect : 2 hrs.; R.C. MacG. Dawson.

This course provides 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 courses.

203 Masterpieces of Western Literature. lect.: 3 hrs.; H. Whittier.

This class is intended to provide the student with the opportunity to do intensive reading of selected major works from Western literature. The intensive reading 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

This class is devoted to an intensive study of about a dozen representative European novels of the last two hundred years. The method of aproach and the character of tests and examinaons are such as to render it necessary for the student to attend most of the lectures. A conderable amount of attention is paid to the Milosophical ideas which bulk large in many of the novels studied.

Century, lect .: 2 hrs.; S. Cowan.

This class is intended as an introduction to the main thematic and technical trends in the modern novel. Each section has its own emphasis and choice of texts.

poetry.

213 American Literature of the Twentieth Century, lect.: 2 hrs.: R. Hafter.

This class is an introduction to the American Literature works by major writers from 1800 to 1900. Some of the writers studied are Cooper. Hawthorne, Poe. Emerson, Melville, Whitman, Dickinson, and Twain.

207 Canadian Literature, lect.: 2 hrs.; M.G. Parks, P. Monk.

This course follows the development of prose and poetry in Canada from pre-Confederation to the present day through extensive samplings of the major writers in the various genres. Each section has its own emphasis and choice of texts.

208 The English Novel to 1900, lect.: 2 hrs.; H.D. Sproule, A.J. Hartley.

The class is designed primarily to acquaint students with the chief landmarks of eighteenth and nineteenth-century fiction and to present a survey of the origins and developments of the English novel.

209 Twentieth-Century Fiction, lect.: 2 hrs.; H. Whittier, A. Kennedy,

212 British Literature of the Twentieth Century, lect.: 2 hrs.; N.S. Poburko,

This class is a survey introduction to the past seventy-five years of British fiction, drama, and

214 Shakespeare, lect .: 2 hrs.; C.J. Myers, R.M. Huebert.

This class is designed 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. Only minimal consideration is given to textual variations, sources and influences.

215 Poetry of the Romantic Period, lect.: 2 hrs.; R.R. Tetreault.

A class which will focus on the poetry of Wordsworth, Coleridge, Byron, Shelly, and Keats. At the outset some attention will be directed to the pre-Romantic poets and to the intellectual background of the Romantic poets and to the intellectual background of the Romantic movement.

### enalish 96

216 The Gothic Novel, lect .: 2 hrs.; D.P. Varma.

This class will survey 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 will also explore the various chambers of horrorliterature.

217 African Literature/African Studies, lect .: 2 hrs.: R.J. Smith.

This is a class on African Literature written in English. Novels, plays, and poems will be discussed. The bulk of the material will be by Southern African and West African writers. Works to be studied will mainly be modern, and will reflect the attitudes of various African cultures towards racism, colonialism, and African nationalism.

218 Mediaeval Literature, lect.: 2 hrs.; H.E. Morgan.

This board survey concentrates upon a study of heroic and romantic attitudes and ideals in some mediaeval masterpieces, including Beowulf, The Song of Roland, Njalssaga, Tristram, and the saga of King Arthur. Later use of this mediaeval matter, as in Tolkien's Lord of the Rings, is also investigated.

220 English Drama, lect.: 2 hrs., R.M. Huebert.

This class will attempt to trace the development of dramatic literature from Greek times to the twentieth century. The texts are to be examined for their dramatic impact as well as for the themes and social problems they explore.

225 Epic, Romance, and Fantasy, lect.: 2 hrs.; P. Monk. Not offered 1977-78.

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.

This class will give students an opportunity to study the nature and method of tragedy in literature. Examples will be taken from Greek, Shakespearean, and modern drama, as well as from poetry, and from novels.

227 Comedy and Satire, lect.: 2 hrs.; Ja Stovel.

The comedian and the satirist are interested both the laughable and the deplorable antics and eccentricities of human nature. This class w concern itself with their points of view, as e pressed in such varied forms as stage comed graphic satire, the comic novel, and the humoro essav.

228 Short Poems in English, lect.: 2 hrs.; Sr Sprott. Not offered in 1977-78.

Forms and themes in the short poem are studie by means of critical reading of poems written. English. Topics may include the following: self in the short poem; other persons; put events; love; nature; the city; the machine; myth; traditional forms; free verse; the hoke lyric as song; spoken poetry; poetry in print; co crete poetry; and possibly other topics to suit th class.

Recommended Preliminary Reading: C Wheeler, The Design of Poetry, New York Norton, 1966.

229 Victorian Literature, lect .: 2 hrs.; C. Mvers.

This course provides an introduction to Victor Literature with an emphasis on the literature social criticism.

231 Modern American and Canadian Novel lect.: 2 hrs.; A.R. Bevan, M.A. Klug.

This class deals with an equal number American and Canadian novels. The novels wil American and Ganadian notation instructors establishment of texts, particularly older ones. divide their time equally between the two s tions.

## 232 Modern Drama, lect.: 2 hrs.

The principal aim of this class would be to or the major developments in drama during the 100 years. Special attention would be give changes in dramatic style (realism versus s bolism), and to the growth of modern theatro movements (theatre of the absurd, theatre cruelty). Some important supplementary qu design, modern theories of acting and prot tion, the theatre of political protest, the definit qualities of Canadian drama.

233 Science Fiction and Fantasy, lect.: 21 S.A. Cowan

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selected works of speculative fiction will be read Selected well and studied for understanding. The for pleasure on analysis and evaluation of the study will locate and evaluation of the works as literature. Some major classifications of speculative fiction will be suggested, and recurspeculative will be identified. The approach will ting themes will be approach will be largely through discussion, though some lecbe largery the expected. Each student will give oral reports to the class, will participate in panel discussions, and will write term papers, tests, and a final examination. Non-majors are welcome.

301 Modern Poetry in English, lect.: 2 hrs. S.E. Sprott.

a study of the creation and development of modern poetry in English is based on the seminal poets Yeats, Pound, and Eliot, with some attention to Auden, Dylan Thomas, W.C. Williams. Stevens, and others, including Canadians.

Classes for the Honours Degree

(Tentative List)

50C Bibliography, lect.: 1 hr.; (first term only). R.L. Raymond.

This class is 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

The class meets one hour a week during the first term only and includes the assignment of an exercise to be done in the library.

English 51B Practical Criticism, lect .: 1 hr. (second term only); R.L. Raymond.

his is a non-credit class designed to give the student practice (supplementary to that of his regular lasses) in the evaluation and understanding of he purpose and significance of iiterature, largely cruelty). Some important supplementation the Poetry. The class includes some discussion of recent and current attitudes to literature, but the mphasis is upon the practice of criticism on well-known and obscure or unpublished

> Sixteenth-Century Non-Dramatic Lilerature, lect .: 2 hrs.; G. Waller.

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 should consult the instructor for a list of plays and suggested preliminary reading.

## 254 Restoration and Eighteenth-Century Literature, lect.: 2 hrs.; H.D. Sproule.

In this class the emphasis will be placed upon three great satirical authors (Drvden, Pope, and Swift), upon a study of Restoration comedy and tragedy, and upon major works of Samuel Johnson. Since the literature of the period is related exceptionally closely to the men and manners of the age, some time will be spent in class on the contemporary climate of opinion that is 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.; R. MacG. Dawson.

This class offers an introduction to Middle English language and literature through study of Chaucer's poetry and of major literary works by Chaucer's near-contemporaries. Through his readings, the student should gain some historical sense of the language, of the social milieu and especially of the late-mediaeval social tensions

The class will study the literature of the English Renaissance, concentrating on Sidney, Spenser, and Shakespeare's poetry. Some attention will be given to the cultural context including the court.

music, and art, and to influential continental writers like Castiglione and Machiavelli. Classes will be conducted by a mixture of lecture and discussions and there will be frequent use made of slide and other illustrative material.

252 Shakespeare and the Drama of His Time. lect.: 2 hrs.: S.E. Sprott.

### 253 Old English, lect.: 3 hrs.: H.E. Morgan

An introduction is given 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 will also be introduced to some aspects of Old English art and archaeology. Some knowledge of a classical or modern European language (preferably German) is desirable, though not essential, and an understanding of traditional grammatical terminology will be helpful. This class is not recommended, except in unusual circumstances, to those who are not thoroughly fluent in modern English;

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which contributed to the literature's brilliance.

Preparatory reading: Chaucer's poetry and H.S. Bennett, Chaucer and the Fifteenth Century (Oxford History of English Literature, vol. II, 1); W.F. Bolton (ed.). The Middle Ages (Sphere pbk.); J.B. Morrall, The Medieval Imprint (Penguin); M. Keen, History of Medieval Europe (Penguin).

## 352 Seventeenth-Century Non-Dramatic Literature, lect.: 2 hrs.: S. Cowan.

This class is a study of representative works of Bacon, Donne, Jonson, Browne, Burton, Herrick, Herbert, Crashaw, Vaughan, and Milton. The aim of the class is, through a study of representative writers, to provide the student with an introduction to both the individual and traditional characteristics of poetry and prose of the period. Classes are conducted by a combination of lecture and discussion. Students present brief reports to the class that establish starting points for discussion. A paper of moderate length is written each term. There are examinations at Christmas and in the Spring.

## 354 Victorian Novel, lect.: 2 hrs.; S. Mendel.

This class is designed to give the student the opportunity of studying the novels of the period from Scott and Austen to Hardy.

## 356 Literature of the Romantic Period, lect.: 2 hrs.; A.J. Hartley.

A study of the major poetry of Wordsworth, Coleridge, Byron, Shelley, and Keats, supported by a survey of the genesis and development of the romantic movement as well as by representative prose of that period.

## 357 The Making of Modern Poetry in Canada, lect.: 2 hrs.; P. Monk.

This course concentrates on the development of poetry in Canada from approximately 1867 to 1967.

452 Nineteenth-Century Thought, lect.: 2 hrs.

## 453 Twentieth-Century English Literature, lect.: 2 hrs.; J. Fraser.

This seminar is for honours students and for M.A. students in their make-up year. The procedure in it is to present students with a variety of texts and problems in a meaningful sequence and let them argue about them. 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. The following pr works will be discussed: Joyce, A Portrait Artist as a Young Man (Penguin); Conrad Secret Agent (Penguin); Woolf, To the Lighthan (Penguin): Orwell, A Collection of Essays chor); Beckett, Endgame, Pinter, The Birthday ty, Cary. The Horse's Mouth (Penguin); Dire Justine, Storey, This Sporting Life, (Penguin terspersed with these, selections from the four ing poets will be discussed: Pound, Eliot, ya Hopkins, Auden, Dylan Thomas, Hardy Gran Gunn, Hughes, and one or two younger ones editions indicated are the ones that the bookst will be carrying.

## 454 Literary Criticism, lect.: 2 hrs.; R. Hafter

This class is intended for senior hope students. It involves the history, theory, and not tice of literary criticism from Aristotle to the sent.

## 455 Modern American Literature, lect.: 2 hr M.Klug.

This class will study the growth of America literature over the past seventy years. The term will be devoted to poetry and will centre readings from Frost, Eliot, Lindsay, Steve Williams, Crane, Lowell, and Roethke. Thron the second term we will be working with fict-Dreiser's Sister Carrie, Fitzgerald's Great Gate Hemingway's The Sun also Rises, Faulkne Light in August, Ellison's Invisible Man, Bellon Adventures of Augie March, and Maile American Dream. The classroom work will inve lecture and discussion. Each member of the da will write one paper in the fall and spring terms topic of his own choice. A final examination the year's reading will be set.

## 457 Victorian Literature, lect.; 2 hrs.; M. Ros

A study of the major Victorian poets and po writers (other than novelists). Attention will given to the changing philosophical, scient and social pressures of the period. The main phasis of the class will be on the poetry of I nyson, Arnold and Browning and the prose Carlyle, Ruskin Newman, Arnold and Pater.

### **Changes and Additions**

As the Calendar goes to press before all plans the next academic year are completed, there be significant changes in the classes above. Students should consult the Registration fice and the DepartmentalSupplement for revis class and text lists.

# english

Graduate Studies Graduate offers graduate classes leading The Department of M.A. and Ph.D. Details relating to the degree scholarships and fellowships, reto admission, the degree, classes of instruction. etc. can be found in the Calendar of the Faculty of Graduate Studies.

## french

## French

Professors

H.F. Aikens P. Chavy J.R. Lawler (Chairman)

> Associate Professors R. Kocourek D.W. Lawrence

Assistant Professors E. Boyd J.W. Brown T.P. Carter B.F. Gesner W.T. Gordon

People choose to study French for a variety of reasons - desire to gain understanding of one of the world's richest cultures, interest in the language for its own sake, preparation for certain careers (teaching, translating, etc.), or serving the cause of Canadian unity. The Department offers an excellent opprotunity for pursuing such study to those whose interest is strong enough to make them willing to devote a good deal of their time and energy to it.

In general, students are expected to acquire a good knowledge of spoken as well as written French, As students' skill grows, French is used more and more in classes. The accent aimed at is "international": that is, recognized as standard both in France and in French Canada. Much use is made of the language laboratory in the acquisition of oral skills. The object of our language instruction is to provide, through the judicious use of modern methods, a solid basic training that will enable students who spend a few months consolidating their knowledge in a French-speaking community to develop fluency rapidly and with precision.

Some students wish or are required only to gain a reading knowledge of French. Provision is also made for their needs.

If your tastes and abilities lie in the direction of French studies, you should consider the possibility of taking a Bachelor's degree with Honours in French or with Honours in French and another subject combined. Those who wish to do so, or to take French as an area of concentration in a General Bachelor's degree course, are encouraged to discuss the matter at any time (but the earlier the better) with a member of the Department. An Honours degree is norally required for access to graduate studies.

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A. Kom H.R. Runte R Runte M. Sandhu C.J. Simon S.Villani

Lecturers

M. Bishop

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R. Ginsberg K. Waterson Lecturers (part-time)

H.F. Bednarski M. Boss

## French Dearee Programmes

### **General Bachelor's Degree**

With French as the main area of concentration.

### **First Year**

1000 or 1020: 1050 may be taken in addition to one of the aforementioned courses.

### **Subsequent Years**

French 1000 or 1020 is the pre-requisite for courses at the 2000 level and above.

The Department encourages majors to take eight courses in French beyond the first year. Students should take a minimum of three French courses in their second year.

Majors who are enrolled in a general bachelor's degree programme must take at least one French course at the 3000 level.

## Bachelor of Arts with Honours in French

A decision regarding admissibility to Honours is not usually made until the end of the student's sedond year in the Department. Details of the Honours program in French in the Third and Fourth Years are to be arranged by consultation with the Department. Honours standing for courses taken at the 2000 level is B- or higher.

Students in the Honours programme with French as main subject are encouraged to take the maximum of eleven courses in French beyond the first year; concentrated honours students are required before graduation to:

Either: write an Honours essay under the supervision of a member of the Department in an area connected with the programme,

Or: write a comprehensive examination.

## Bachelor of Arts with Combined Honours in **French and Another Subject**

Programmes may be arranged by consultation (as early as possible) with the departments concerned. Students planning a combined Honours course should consider, however, that the number of classes taken in either subject might be insufficient for admission to many graduate programmes without at least an extra year's work.

### Notes

(1) A student may, with the permission of the Department, be admitted to a French 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.

(2) A student admitted to a French course at an

advanced level who obtains credit for a class that level, may not later take a French class lower level for credit except with the express mission of the Department.

### French Classes Offered

Note: The numbers in parentheses correspond former numerical designations of courses.

### 1000 level (102)

Students interested in French studies are couraged to enroll in either French 1000 or Fre-1020 plus French 1050 in their first year. (Nat however, that French 1050 by itself is not a har for further study.)

## First-year French Language Courses

As may be observed below, the French Den ment offers two separate first-year Fre language courses, French 1000 and French in which are mutually exclusive. It should be not that there are certain differences between the courses with respect to the following: gen level of attainment demanded for registration (French 1000 may, in certain cases, accept be ners and French 2000A would be desirable complete coverage of basic structures of spok French: French 1020 is a complete review cour catering to students with a high-school ba ground in French), skills taught (French t stresses principally speaking and listening sk French 1020 whilst also devoting considerable tention to these skills, develops reading writing proficiency in addition), methods teaching (French 1000 involves rigorous varied oral training and frequent usage language lab facilities; French 1020 offers a programme, but classes, conducted primarily French, remain the principal place of an oral p formance applied to a wide range of situat and short readings). Full details of each cou will be found below.

## French 1000(102), Basic Spoken French (Pa 1). lect.: 3 hrs. and language lab, 3-5 hours week according to individual needs.

quire a solid background in spoken Frenc lect.: 3 hrs.; language lab, 1-3 hrs per week. whether or not they have studied French before is thus suitable for serious beginners as well. This course is designed for those who wish to im-

## french

structor). Written work will be included only in so structure as students will learn to write what they learn to say; however, testing will reflect to a very io say, indegree the oral emphasis of the course.

The method used is essentially self-instructional. students are expected to come to each class for students practice in the structures they have already learned and practiced in the language aboratory. A sense of self-discipline and willingness to spend the requisite time in the language laboratory (at hours of the student's any choosing) are therefore indispensable. An aptitude test will help determine students' capacity for second-language acquisition.

French 1000 is offered MWF from 9:35-10:25 or from 10:35-11:25 only. Sections are limited to fifteen students each and there is a limited number of sections, so early registration is advisable. French 1000 is normally followed by French 2000A and 2021B (see separate descriptions below). However, a student may take the equivalent of these three classes in a single year for two credits (French 1000 and French 2000): this double-credit option meets five days per week from 1:35-2:25 only, with a recommended 5-8 hours of independent study in the language laboratory (students taking these combined classes normally take only three other classes at the University). As with the single-credit option, there are few outside assignments other than this individual work in the language lab.

Students interested in registering for French 1000 or the double-credit option (French 1000:& 2000) are required to complete the special questionnaire which may be obtained from : The Secretary. French 1000, Department of French, Dalhousie University, Halifax, N.S. B3H 4H8, (902) 424-2432.

N.B. The language laboratory is open all day and most evenings from Monday to Friday, and for shorter periods on Saturdays and Sundays. Students work in the lab individually, and as long as they wish, at hours of their choice.

This course is designed for those who wish tos 1020, Spoken and Written French in Review.

for those whose previous training in oral Frei prove and extend their present knowledge of has been slight (students who already have go spoken and written French. While it is not command of the spoken language will be advis suitable for genuine beginners, it presents a suffiearly to take another class in the Department clently basic grammar review for those whose The focus of this class is an oral (spoken) granulation training in French has not been mar, phonology (pronunciation), controlled developed to the usual high school level. This pression (through oral translation and a variety class proposes to develop proficiency in speaking other exercises), listening comprehensi and listening skills as well as in reading and (including French-Canadian), and free express writing. These aims will be achieved through a (in regular meetings of 4-5 students with one variety of reading materials upon which will be

424-2432

Readings and discussions in English and/or French (according to students' wishes and proficiency) serving as a general introduction to various aspects of French studies at the university - literary, linguistic and cultural. Intended for any student interested in French studies, including those who do not plan to specialize. In addition, provides orientation for those who may wish to continue in this field. N.B. - This class is open to all students, but does not by itself constitute a basis for admission to 2000 level classes in French. (For admission to 2000 level classes. students must have completed a 1000 level language class or present evidence of equivalent standing).

### 1060 (106), Proficiency in Reading, lect. 3 hrs.

Concentrates on developing the ability to read contemporary French prose with ease and accuracy. Emphasis is placed on the acquisition of tools which 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 whenever 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 not suitable for students who plan to major in French or who might consider doing so. It may, however, be taken by those with no prior training in French.

based oral and written exercises, discussions and some compositions. A largely self-instructional lab programme will be available to reinforce basic oral performance. Testing will reflect the balance among the four skills.

French 1020 is normally followed by French 2020.

Students who desire further information concerning French 1020 are invited to write to: The Secretary, French 1020, Department of French, Dalhousie University, Halifax, N.S. B3H 4H8, (902)

1050 Introduction to French Studies, lect.: 2 hrs., tutorial 1 hr.

2000 Basic Spoken French (Parts II and III), lect.: 5 hrs. language lab, 5-8 hours per week, according to individual needs.

This class continues and completes the work begun in French 1000. It is a combined form of French 2000A and 2021B and may only be taken by students taking French 1000 in the same year. This combined class (French 1000 and 2000)

### French Degree Programmes

### **General Bachelor's Degree**

With French as the main area of concentration.

### **First Year**

1000 or 1020; 1050 may be taken in addition to one of the aforementioned courses.

### **Subsequent Years**

French 1000 or 1020 is the pre-requisite for courses at the 2000 level and above.

The Department encourages majors to take eight courses in French beyond the first year. Students should take a minimum of three French courses in their second year.

Majors who are enrolled in a general bachelor's degree programme must take at least one French course at the 3000 level.

### **Bachelor of Arts with Honours in French**

A decision regarding admissibility to Honours is not usually made until the end of the student's sedond year in the Department. Details of the Honours program in French in the Third and Fourth Years are to be arranged by consultation with the Department. Honours standing for courses taken at the 2000 level is B- or higher.

Students in the Honours programme with French as main subject are encouraged to take the maximum of eleven courses in French beyond the first year; concentrated honours students are required before graduation to:

Either: write an Honours essay under the supervision of a member of the Department in an area connected with the programme,

## Or: write a comprehensive examination.

### Bachelor of Arts with Combined Honours in **French and Another Subject**

Programmes may be arranged by consultation (as early as possible) with the departments concerned. Students planning a combined Honours course should consider, however, that the number of classes taken in either subject might be insufficient for admission to many graduate programmes without at least an extra year's work.

### Notes

(1) A student may, with the permission of the Department, be admitted to a French 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.

(2) A student admitted to a French course at an

advanced level who obtains credit for a class that level, may not later take a French class, lower level for credit except with the express mission of the Department.

### French Classes Offered

Note: The numbers in parentheses correspond. former numerical designations of courses.

### 1000 level (102)

Students interested in French studies are couraged to enroll in either French 1000 or Fren 1020 plus French 1050 in their first year. (No however, that French 1050 by itself is not a bas for further study.)

## First-year French Language Courses

As may be observed below, the French Den: ment offers two separate first-year F language courses, French 1000 and French 102 which are mutually exclusive. It should be not that there are certain differences between the courses with respect to the following: gene level of attainment demanded for registration (French 1000 may, in certain cases, accept beg ners and French 2000A would be desirable complete coverage of basic structures of spoke French; French 1020 is a complete review cours catering to students with a high-school ba ground in French), skills taught (French 1 stresses principally speaking and listening sk French 1020 whilst also devoting considerable: tention to these skills, develops reading writing proficiency in addition), methods teaching (French 1000 involves rigorous a varied oral training and frequent usage language lab facilities; French 1020 offers a programme, but classes, conducted primarily French, remain the principal place of an oral p formance applied to a wide range of situation and short readings). Full details of each course will be found below.

### French 1000(102), Basic Spoken French (Par 1). lect.: 3 hrs. and language lab, 3-5 hours pe week according to individual needs.

quire a solid background in spoken Frenc whether or not they have studied French before is thus suitable for serious beginners as well? command of the spoken language will be advise mar, phonology (pronunciation), controlled pression (through oral translation and a variety

french structor). Written work will be included only in so structor, students will learn to write what they learn tar as showever, testing will reflect to a very significant degree the oral emphasis of the course.

The method used is essentially self-instructional. Students are expected to come to each class for further practice in the structures they have already learned and practiced in the language already. A sense of self-discipline and willingness to spend the requisite time in the language laboratory (at hours of the student's own choosing) are therefore indispensable. An aptitude test will help determine students' capacity for second-language acquisition,

French 1000 is offered MWF from 9:35-10:25 or from 10:35-11:25 only. Sections are limited to fifteen students each and there is a limited number of sections, so early registration is advisable. French 1000 is normally followed by French 2000A and 2021B (see separate descriptions below). However, a student may take the equivalent of these three classes in a single year for two credits (French 1000 and French 2000); this double-credit option meets five days per week from 1:35-2:25 only, with a recommended 5-8 hours of independent study in the language aboratory (students taking these combined classes normally take only three other classes at the University). As with the single-credit option, there are few outside assignments other than this ndividual work in the language lab.

Students interested in registering for French 1000 or the double-credit option (French 1000 & 2000) are required to complete the special questionnaire which may be obtained from : The Secretary, French 1000, Department of French, Dalhousie University, Halifax, N.S. B3H 4H8, (902) 424-2432.

N.B. The language laboratory is open all day and most evenings from Monday to Friday, and for shorter periods on Saturdays and Sundays. Students work in the lab individually, and as long as they wish, at hours of their choice.

## This course is designed for those who wish to a 1020, Spoken and Written French in Review, lect.: 3 hrs.; language lab, 1-3 hrs per week.

This course is designed for those who wish to imfor those whose previous training in oral Frence prove and extend their present knowledge of has been slight (students who already have gov spoken and written French. While it is not sultable for genuine beginners, it presents a suffiearly to take another class in the Department clently basic grammar review for those whose The focus of this class is an oral (spoken) gra previous training in French has not been developed to the usual high school level. This class proposes to develop proficiency in speaking other exercises), listening comprehensite and listening skills as well as in reading and (including French-Canadian), and free express<sup>6</sup> Writing. These aims will be achieved through a (in regular meetings of 4-5 students with one Variety of reading materials upon which will be

among the four skills.

Students who desire further information concerning French 1020 are invited to write to: The Secretary, French 1020, Department of French, Dalhousie University, Halifax, N.S. B3H 4H8, (902) 424-2432.

### 1050 Introduction to French Studies, lect.: 2 hrs., tutorial 1 hr.

Readings and discussions in English and/or French (according to students' wishes and proficiency) serving as a general introduction to various aspects of French studies at the university - literary, linguistic and cultural. Intended for any student interested in French studies, including those who do not plan to specialize. In addition, provides orientation for those who may wish to continue in this field. N.B. - This class is open to all students, but does not by itself constitute a basis for admission to 2000 level classes in French. (For admission to 2000 level classes, students must have completed a 1000 level language class or present evidence of equivalent standing).

### 1060 (106), Proficiency in Reading, lect. 3 hrs.

Concentrates on developing the ability to read contemporary French prose with ease and accuracy. Emphasis is placed on the acquisition of tools which 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 whenever 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 not suitable for students who plan to major in French or who might consider doing so. It may, however, be taken by those with no prior training in French.

### 2000 Basic Spoken French (Parts II and III), lect.: 5 hrs. language lab, 5-8 hours per week. according to individual needs.

This class continues and completes the work begun in French 1000. It is a combined form of French 2000A and 2021B and may only be taken by students taking French 1000 in the same year. This combined class (French 1000 and 2000)

based oral and written exercises, discussions and some compositions. A largely self-instructional lab programme will be available to reinforce basic oral performance. Testing will reflect the balance

### French 1020 is normally followed by French 2020.

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counts for two credits in a single year. Students taking this intensive, combined option normally take only three other classes at the University; permission to take more than three other classes must be obtained from the University Committee on Studies. Offered MTWRF from 1:35-2:25 only.

Prerequisite: Registration for French 1000 in the same year (see description for French 1000).

2000A Basic Spoken French (Part II), lect.; 3 hrs., language lab, 3-5 hrs. per week, according to individual needs.

This one-semester, half-credit class continues and completes the work begun in French 1000; language laboratory hours are freely chosen as in French 1000.

Normally followed by French 2021B.

Prerequisite: French 1000 or permission of the instructor.

## 2020A/2021B (202B), Practice in Language Skills, lect.: 3 hrs.

Each section of French 2020A/2021B concentrates on a specific content area, as listed below. All classes and assignments are entirely in French, and evaluation is based on a balance of progress in language skills and basic comprehension of course content. Work may be assigned in the language laboratory. Students are encouraged to consult with the instructors concerned for further details about each section.

All sections of French 2020A/2021B are mutually exclusive for a given term, i.e. students may enroll in no more than one A or B section per term for credit. Students who have not taken French 1000 or 1020 at Dalhousie must obtain written permission from the course coordinator in order to enroll in 2020A/2021B. All sections are limited in size to 15 students, so early registration is advisable. Students must register for French 2020A and French 2021B separately.

Topics may be chosen from the following list of titles (N.B. Most Topics are offered at different times, so it will be necessary to arrange student schedules accordingly.).

2020A Du Livre à la Scène Le Roman policier

2021B La Compréhension auditive Etudes africaines Le Deuxième Sexe Actualités et Réalités

### 2040 (204) Composition, lect.: 3 hrs.

The aim of this course is to clarify grammatical

elements acquired earlier and to place them logical frame of reference. Selections repress ting the different literary genres, discussions, exercises in translation are integral parts of course.

2200 (230) Introduction to French Literature lect.: 3 hrs.

A critical introduction to the literature of Fran. and French Canada, from Molière and Voltaire Apollinaire and Sartre.

## 3000, Advanced Oral French, lect. 3 hrs.

A two-term course employing an attractive , proach to the teaching of advanced oral expre sion and conversation.

Not offered in 1976-77

## 3010 (321), Phonetics, lect.: 3 hrs.

An introduction to the study of the sounds language, with special reference to English a French: how these sounds are perceived and pr duced, their classification, practice in the user phonetic symbols, basic phonemic theory formation on French pronunciation, but n primarily a class in remedial pronunciation).

Prerequisite: familiarity with the spoken forms: English and French.

### 3020 (322) Linguistics, lect.; 3 hrs.

The topics discussed include the nature of huma language; branches and applications of language study, including various approaches to foreit language teaching; relation between sound and meaning and problems of translation; relations between speech and writing; linguistic diversion bilingualism, and standard language; linguis change, related language families, and ma world languages. Emphasis will be placed on non-historical aspects of language structu (words, sentences, sounds).

### 3040 (304), Composition, lect.: 3 hrs.

Detailed and comprehensive coverage of gra mar with emphasis on acquiring skill in comp tion. Supplementary written exercises consist translating selected French and English texts.

3070 (325) Applied Linguistics for Teacht of French, lect .: 2 hrs. Same as Educa 4520.

This class is intended for students in Educal Enrollment requires the written consent of the

## french

structor. See description under Education 4520.

3080 (326), Methods of Teaching French, lect. 3 hrs.

The course deals with traditional and, especially, contemporary theory and practice of teaching French as a second language. Students may register for this class only with the consent of the instructor.

## 3100 (312), Civilization of France and French Canada, lect.: 3hrs.

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.

prerequisite: good basic knowledge of spoken and written French.

## 2110A/2111B (212 A/B), Civilization of French Canada, lect.: 3 hrs.

This course will examine French Canada from a socio-political viewpoint with focus on the ideaology of the major historical periods and also on various social groups.

3200 (310 A/B), Literary Appreciation, lect.: 3 hrs

This class is an approach to the critical reading of modern French prose, poetry and drama. It will study representative works of major authors of the nineteenth and twentieth centuries by way of close textual analysis. It will also include some discussion of recent and current theories of literature.

3300A (350A), Introduction to Medieval French Lit., lect.: 3 hrs.

Textual analyses of selected works representing the major literary genres (epic, romance, theater, poetry) from the chansons de geste to Francois Villon (most texts in modern French translations). The discussion of the origins and the development of a national French literature will provide a convenient introduction to critical approaches to literary texts.

Not offered in 1976-77.

<sup>3401</sup> (350B), Introduction to 16th Century French Lit., lect.: 3 hrs.

eliving the awakening, bloom and decline of the Renaissance period in literature and language

Not offered in 1976-77.

The theatre in seventeenth 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.

### 3601B (330B), Introduction to 18th Century French Lit., lect.: 3 hrs.

Basic survey course designed to introduce the student to the literature of the 18th century which includes works by such authors as Voltaire, Rousseau, Diderot and Marivaux. The Enlightenment (from the death of Louis XIV to the French Revolution) will be discussed in terms of its philosophical, historical and social impact.

### 3700A (331A), Introduction to 19th Century French Lit. lect.: 3 hrs.

An introduction to the main literary movements of the 19th century: Romanticism, Realism, Symbolism. Focus will be placed on representative authors and/or texts belonging to one or more of these trends.

French Lit., lect.: 3 hrs.

Poetry and Theatre: 1900-1975

sent day.

lect.: 3 hrs.

Critical investigation into the historical, sociocultural, linguistic and literary significance of past and present Acadian writing. (may be preceded by 2000 A/B).

lect.: 3 hrs.

## 103

through the works of Marot, Rabelais, DuBellay, Ronsard, Montaigne and the poets of the baroque. The century's concern with the French language will provide a convenient introduction to the study of the development of modern French.

3500A (330A), Introduction to 17th Century French Literature, lect.: 3 hrs.

# 3801 (331B), Introduction to 20th Century

3900A/3901B (340 A/B), Introduction to French-Canadian Literature, lect.: 3 hrs.

This course concentrates on the in depth study of a few major works of French Canadian literature with emphasis on the period from 1945 to the pre-

### 3910 The Development of Acadian Literature,

4000 (420), History of the French Language.

This introduction to Old French, followed by a study of Middle and Classical French, should enable students to approach texts from any literary period. Phonetic and grammatical changes will explain many so-called oddities of to-day's langauge. Attention is given to dialects, past and present, including Canadian French. Some knowledge of Latin is desirable, though not essential.

# 4010 (423), Evolution of Linguistics, lect.: 3 hrs.

Development of language study from early times to the present day. Emphasis is on the interpretation of selected French texts of important writers on language. The second term is entirely devoted to twentieth century authors.

4015, Advanced Translation into English, lect.; 3 hrs.

A two term course dealing with the difficulties and techniques of French-English translation.

## 4020 (425), Acoustic Phonetics, lect.: 3 hrs.

This course aims at providing the student with the fundamental concepts necessary for a study of the sounds of language from the point of view of the physical properties of sounds. By the year's end, the student should be able to interpret 'visible speech' from spectrogrammes, oscillogrammes and other modes of scientific analysis. Also by year's end the student himself will have analysed sample portions of speech and will have the possibility of investigating a specific problem of interest to him (i.e. sounds of Acadian, French-Canadian or Standard French).

Not offered in 1976-77.

4040 (404), Composition, lect.: 3 hrs.

Continues the work of 3040 at a higher level.

Prerequisite: French 3040.

4300A/4301B (430 A/B), lect.: 3 hrs.

### A) Le Roman courtois

A close, literary analysis of medieval French Arthurian romances. Texts in bilingual (Old French/ French) editions.

### B) La Poésie courtoise

A stylistic and socio-cultural study of French courtly love poetry from the ninth to the fifteenth centuries. Early texts in modern French translations.

Not offered in 1976-77.

### 4400A/4401B (431 A/B), Sixteenth Century French Literature, lecture-seminars: 3 hrs.

This course surveys the development Humanistic thought, the poetics of the Pleiad tragedy, comedy and the plastic arts in the Frence Renaissance. In seminars, a close textual stud will be made of the major writers: Clement Maro Marguerite de Navarre, Sceve; Rabelais, Ronsan Du Bellay, Montaigne. A basic knowledge spoken and written French is essential.

# 4500A/4501B (432 A/B), Literature of the Seventeenth Century, lect.: 3 hrs.

A) Major seventeenth century "moralistes" keen observers of man, society and the huma condition): Pascal, LaRochefoucaut LaBruyère, La Fontaine. Not offered in 1976-77.

B) Molière

# 4600A/4601B French Literature of the 18th Century, lect.: 3 hrs.

4601B not offered in 1976-77.

This is an in-depth study of the French Enlighter ment which will treat some of the longer workst major authors, as well as introduce the students secondary authors whose works are also a significant literary, philosophical or historic value. The study will be unified by an examination of recurring philosophical ideas: utopia, har piness, and good/evil, and literary themes important to understanding the development of neugenres and styles.

# 4700A/4701B (434 A/B), French Literature the 19th Century, lect.: 3 hrs.

4700A, Romanticism: Romanticism is viewe primarily as a rebellious and creative force which greatly contributed to reshape traditional society The origins, main themes and trends of the move ment are studied with an attempt to show Romai ticism as a European movement, the impact @ which was felt in fields extended beyond the boundaries of literature (painting, music, socials theories etc.) Classes are conducted as seminar - entirely in French; students are required to a a great deal of personal research, to prepare poses and participate in class discussions. choice of texts depends largely on the student previous experience; they include works by M de Staël, Chateaubriand, Lamartine, Hugo, Vign G. Sand and others.

4701B, La Crise du Vers et le poeme en Pros Traditional French poetry underwent a crisis the 19th century which led poets to seek out or

## french

vent new forms of expression. The poeme en prose is an attempt to create a new poetic language; as such, it serves as a formal transition between traditional and modern poetry. This seminar will focus on the prose poems of the following authors: Bertrand, Baudelaire, Rimbaud, and Mallarme.

# 4710A (436A), French Poetry from Mallarme to Char, lect.: 3 hrs.

The object of this class is to study the evolution of the language of poetry over the past one hundred years. It will take as its starting point Stephane Mallarme, who discovers a wholly new role for the poet. Other poets to be discussed and critically analysed will include Valery, Claudel, Apollinaire and Rene Char.

4800A/4801B (435 A/B), French Literature of the Twentieth Century, lect.: 3 hrs.

A) 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.

### B) Anti-novels of the 20th Century.

In this course we are mainly interested in ficitional techniques: how the author creates his illusion. Each of the works selected for detailed study is important on account of the author's rejection of conventional ideas regarding the form of the novel.

4810B (436B), French Poetry from Mallarme to Char, lect.: 3 hrs.

## See description for 4710A.

4994A/4995B; 4996A/4997B; 4998A/4999B (460 A/B), Independent Research for Honours Stucents.

### Graduate Level Courses

Courses in the 5000 series are for graduate students. Their subject matter, century designation, etc. correspond to 4000 level courses (e.g. French 5800 will deal with some aspect of 20th century French literature). Special seminars will be offered on a variety of topics (please consult the Graduate Advisor) in addition to the following:

5024 (524), Linguistics Seminar

Not offered in 1976-77.

## 5200 A, B, C (512 A, B, C), Research Methods

Practical introduction for honours and M.A.

students to reference works, journals, libraries, bibliographies and publications in the students' field of specialization. Actual application of methods concerning editing, reviewing, abstracting and article and paper writing connected with the students' thesis work.

5994A/5995B; 5996A/5997B; 5998A/5999B Independent Research for Master's Thesis

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### Geology

### Professors

H.B.S. Cooke (Carnegie Professor) M.J. Keen (Chairman) G.C. Milligan (Undergraduate Advisor) P.E. Schenk (Graduate Co-ordinator)

### Associate Professors

F. Aumento D.B. Clarke J.M. Hall F. Medioli D.J.W. Piper (jointly with Oceanography) P.H. Reynolds (jointly with Physics)

### **Assistant Professors**

W.B. Ervine G.K. Muecke J.W. Peirce M. Zentilli

### **Departmental Demonstrator** N. Lyttle

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.

Its economic importance is by now self-evident. Mankind has used more fossil fuels - oil, natural gas and coal in the last twenty-five years than in all its previous history; the world's reserves of oil and gas are counted in terms of two decades or so. Production of all minerals, including fossil fuels, counts for a very substantial part of Canada gross national product. This importance is recognized by all governments in Canada; the federal government maintains a large geological survey, and the provincial governments maintain comparable organizations. Its environmental importance is also self-evident. We cannot plan a pipe line from the Arctic without considering the properties of the rocks through which, or over which, it will run. We cannot design cities without concern for the sources of building materials and of aggregates for roads, and for water supplies and sewage disposal.

The intellectual excitement of the study of the earth has been enormous in the past ten years and promises to continue so in the next. During this time scientists studying the earth have shown that the continents really do drift - that North America and Africa really were once together; indeed, part of Nova Scotia may be really parts of Africa, left behind! The questions now are of the sort: What has caused these vast motions on the surface of our globe? When did they start in the history of the earth? Does knowledge

of them help us in our search for minerals? Man of the recent exciting discoveries about the early have come from the study of the earth beneath the sea, and scientists from Dalhousie have been leaders among Canadians in this work. But the earth cannot be thought of in isolation from the other planets and the sun, and all sorts of new discoveries important to an understanding of the earth have come from the studies by space probes of the solar system.

Halifax and Dartmouth together have facilities which make the region one of the best places in Canada in which to study the earth. The depart. ments of geology, oceanography and physics at Dalhousie are all involved in one way or another as is the department of mineral engineering at Nova Scotia Technical College. The Atlantic Geoscience Centre at Bedford Institute is an arm of the Geological Survey of Canada, responsible for their work offshore. The government of Nova Scotia is involved through its Departments of Mines and Environment, and the Nova Scotia Research Foundation.

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, oceano graphers 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 in terested 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 ther 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 such as metals. petroleum and water. Geologists competent i mathematics, or indeed mathematicians wit some background in geology, might be involved in processing and analysing data using digita computers; those interested in going to sea might work with the Federal Government's marine in stitutions. The federal and provincial govern ments employ geologists in their geological surveys and Departments of Mines; the Canadian government is responsible for supplying get logists to agencies such as UNESCO to work in underdeveloped countries. A graduate with a geology degree and a reasonable background in other sciences would find teaching in high school challenging.

## geology

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 geophysical following subjects in Grades XI and VII.

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 we do strongly advise them. The student should aim to make up deficiencies in his or her high school preparation in the first year at Dalhousie. Note too that at present Grade XII Geology is not counted as equivalent to a Geology 100 level class (in Geology) at Dalhousie.

## **UNDERGRADUATE PROGRAMMES**

These fall into three categories: (1) Programmes and courses for those not majoring in geology, (2) Honours programmes - concentrated, or combined with other subjects, (3) Three-year degree programmes with a major in geology.

### (1) Programmes and courses for those whose maior is not geology

These courses 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 courses are:

(i) Geology 102, especially designed for students in the humanities and social sciences. Geology 101 and 140 (an evening class) are also suitable introductory classes.

(ii) Two-hundred level classes taught in the evening: 240, 241B, 242A, open to all with 100, 101, 140 or high grades in 102. These are not normally suitable for students whose major is geology.

(iii) For engineering students and science students in other disciplines: Biologists: 223B, 240, 241B, 242A, 423 Chemists: 201, 425, 310, and 424 with extra work. Engineers: 103B Physicists and mathematicians: 103B, 313A, 427A, 428B, 429.

## (2) Honours programmes

Honcurs programmes are designed for students who want a thorough training and think that they are likely to use this training in their careers. An honours degree is almost essential for any professional work in the earth sciences, and for graduate study.

Honours programmes fall into three groups, (a) concentrated, with a major in Geology (b) combined with another subject, (c) unconcentrated, combined with two subjects.

TABLE 1 (a) Concentrated Honours with a Major in Geology: A Typical Programme Year 1 Geology 100 (note (1), (d)) Mathematics 100/101 One class in two of Physics. Chemistry and Biology An elective (note (1), (a)) Year 2 Geology 201 Geology 202A and 223B One class in two of Physics, Chemistry, Biology and Mathematics An elective Field Camp (Note (2)) Year 3 Geology 310, 311A, 312B, 313A, 314B One class in Physics, Chemistry, **Biology or Mathematics** An Elective Year 4 Geology 420 (note (3)) Three 400 level classes in Geology An elective A comprehensive examination (note (3))

(b) 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, normally mathematics. The recommended first classes are: Physics 110, Chemistry 110, Mathematics 100/101, Biology 1000 or 2000. Recommended second classes are: Biology 2000 or 3321, Chemistry 211B, 220A, 231A, 232B, Physics 221 or 230, Mathematics 200, 220, 206 (or 106/107), 225/227.

(c) Students should choose electives using as guidelines that an elective should be enjoyable, or interesting, or useful or, hopefully, have all these

The tables which follow are not considered rigid requirements, but are a guide. All students in honours programmes must consult the Chairman or the undergraduate advisor each year.

### Notes to Table 1

### (1) Classes in Other Subjects

(a) The elective of first year must satisfy the faculty requirements for a class in which the ability to write is emphasized; see the Programme Planning Guide. Students are advised that their ability to write clear and concise English will be an important part of all Geology classes.

characteristics. They should appreciate that they live in a bilingual country, that they will have to write and read many reports in their careers, and deal with businesses and governments. Consequently, classes in English, French, Economics and Political Science may be thought of as useful courses. Such classes may also be interesting and enjoyable.

(d) Exceptionally a student may offer Geology 101 in place of 100.

(e) 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 offer Geology 100 and 210 in Year 2, if he or she has a B + standing in Year 1. A student who has taken Geology 100, but whose program does not meet the other reguirements should consult the department.

(f) Students with a good background in high school Biology are permitted to take Biology 2000 in their first year (see: Biology). If this is done it cannot be counted as one of the classes beyond the 200 level required for an honours degree (this is no disadvantage, but you should know it when planning).

### (2) Field Camps

Students in a concentrated honours programme must complete one field camp at the end of sedond year, and another at the beginning of the third year. Both are integral parts of Geology 311A. A third field camp at the beginning of the fourth year is an integral part of Geology 420. Field work elsewhere may be substituted for the third field camp, but only with departmental approval. This will normally require a letter from the field supervisor, describing the kind and variety of work done.

## (3) Thesis and Comprehensive Examination

A student may choose one of three options: (a) A thesis as Geology 420, followed by an oral examination based on the subject area of the thesis, (but not necessarily restricted to the thesis topic itself). This oral examination will count as the honours comprehensive examination.

(b) He or she may choose not to have an oral examination on the thesis, but to write a written comprehensive examination. This written examination will reflect the content of the 300 and 400 level classes which the student has taken.

(c) He or she may write the honours thesis in addition to four 400 level classes in the fourth year. In this case the thesis will count as the honours comprehensive examination.

Theses must be completed by March 15 of the fourth year (to ensure adequate time for preparation for examinations in other classes). Students who complete them after this date will have graduate in the fall, not the spring. A thesis sub mitted after September 1st following the fourth year will not be accepted, and a general, rathe than an honours degree will be awarded. Only special circumstances is it possible for a studen to receive an honours degree if the thesis is com pleted after September 1st, and in these cases payment of full fees for Geology 420 is required

### (b) Combined Honours and Unconcentrated **Honours** Programme

Honours programmes with other disciplines such as Physics, Chemistry, Biology and Mathematics are often arranged. Such programmes are usefu for students who decide to specialise Geophysics, or Paleontology (as examples Students must consult with the departments con cerned. Possible programmes are shown in the table. The following general comments apply. A normal first year programme would be: Geology 100 Math 100/101

Two classes from Physics 110, Chemistry 110 and Biology 1000 or 2000, which will include the field or fields with which the combination is being made.

An Elective

In the second and third year the student must nor mally include Geology 201, 202A and 223B. In the third and fourth year the student will normally take at least one full credit from Geology 310 311A, 312B, 313A and 341B, and sufficient 400 level classes to meet the requirements. The facul ty requirements for a comprehensive examination will normally be met by meeting the requirements for students in concentrated honours program mes established by any of the departments concerned. Students in combined honours and unconcentrated honours programmes will normally attend the field camp which is a part of Geology 311A, whether or not they register for 311A. This may be taken at the end of second, or third year the second is best.

The tables following give possible programmes. They are only suggestions. Timetable problems may make them difficult to follow precisely.

### TABLE 2 **Combined honours with Biology**

Year 1	Geol 100 Math 100/101 Biol 1000/2000 <sup>2</sup>
	Elec <sup>1</sup>
Year 2	Geol 201 Geol 202A and 223B
	Biol 2040A or B Biol 2060A or B
	Chem 110 or Phys 110

### geology Elec Two from Geol 310-314 Biol 2000 or 3321 or 33235 A class in Phys, Chem, or Math<sup>4</sup> Flec

Geol 420 or Biol 49003 Year 4 One from Geol 310-314 One from Geol 421-423 Biol 3321 or 3323 Elec Comp<sup>3</sup>

year 3

### TABLE 3 **Combined honours with Chemistry**

- Geol 100 Year Math 100/101 Chem 110 Phys 100 or Biol 1000 or 2000 Elec<sup>1</sup> Year 2 Geol 201 Geol 202A and 223B Chem 211B, 220A Chem 231A, 232B or 240 Math 200 or 220 Geol 310 Year 3 One credit from Geol 311-314 One 300 level credit in Chem Phys 110 or Biol 1000 or 2000 Elec
- Two 400 level classes in Geol Year 4 Two 300 level credits in Chem Elec Comp<sup>3</sup>

### TABLE 4

**Combined honours with Mathematics** 

- Year 1 Geol 100 Math 100/101 Two from Phys 110, Chem 110, Biol 100 or 2000
- Elec<sup>1</sup> Year 2 Geol 201 Geol 202A and 223B Math 200, 220 or 250 Math 203 and 204, or 213 One from Phys 110, Chem 110,
- or Biol 1000 or 2000 Year 3 Math 300 or 350 Math 206

Comp<sup>3</sup>

Two from Geol 310-314 A class in Phys or Chem Year 4 One from Geol 310-314 Two credits from Math 335, 462 337, 320, 402 A class in Phys or Chem Elec

TABLE 5 **Combined honours with Physics** Year · Geol 100

Phys 110 Math 100/101 **Chem 110** Elec<sup>1</sup> Year 2 Geol 202A and 223B Phys 230 Phys 221 Math 200 Elec Year 3 Geol 201 Geol 311A, 312B Geol 313A, 314B Phys 320 or 335 or 300 Math or Chem elec Year 4 Geol 310 or 420 Geol 427, 428B, 429 Phys 321 or 335 or 320 or 416 Math or Chem Elec Comp<sup>3</sup>

(1) This elective must satisfy faculty requirements - see Planning Guide.

(2) Biology 2000 should be taken if you are eligible - see Biology section of this calendar, and the notes following "concentrated honours".

trated honours").

(4) Suitable classes include organic, inorganic and physical chemistry, biochemistry, statistics, numerical analysis.

(5) Combined honours with Biology must include Biology 2000 or 3321 and 3323, and 2040A or B and 2060A or B.

### (3) Three Year General Degree Programmes with a Major in Geology

Three year degree programmes with a major in Geology are suitable for students who intend to take further professional training (in Law or Business Administration, for example, or to enter fields where they are likely to need their geological training as background (as a business executive in the mining industry, or as a librarian. in a science library, for example). Three year general degree programmes are of little value to students who plan professional careers in the earth sciences.

One programme recommended for students

### Notes to Tables 2, 3, 4, 5

(3) The thesis requirements and comprehensive examination requirements may be met by meeting the requirements of either department for students in concentrated honours programmes; consequently a student may, for example, choose to write a thesis as well as to take five classes in the fourth year (see notes following "concen-

undertaking a general B.Sc. with a major in Geology is the first three years of the concentrated honours programme (see the table). This programme may not be suitable for all students, and others can be arranged. They must include Geology 201, 202A and 223B. Your attention is drawn to the Faculty regulations under which a student graduating with a general degree with a major in Geology may convert it to an honours degree by certificate. In this connection, you should note that although other 200 level classes may be taken as well as 201, 202A and 223B as part of the General Degree programme, they do not form a part of the core of the programme for concentrated honours in Geology, and cannot count as credits towards an honours degree. Students undertaking a general degree with a major in Geology must attend an approved field school, which will normally be the first of the two field schools offered by the department. It should normally be taken at the end of second year.

### Classes Offered

### Geology 100, Geology 101, Geology 103 and Geology 140.

The study of the earth is based upon observation of natural phenomena, upon experiment and inference. In the last few years intensive study of the rocks of the ocean-floor has led to a revolution in our ideas about the processes responsible for the development of continents and ocean basins; it has led, in a sense, to a new geology. Let us illustrate one aspect only. We know that a huge mountain chain is buried beneath the Atlantic Ocean, running many thousands of miles and rising above sea-level at islands such as St. Helena and Iceland. This Mid-Atlantic Ridge is the place where rock is slowly brought from the interior of the earth, increasing the area of the Atlantic Ocean; the Americas slowly move westwards away from this Ridge, and Europe and Africa slowly move eastwards. One consequence of this as a theory is that the youngest rocks will be found in the middle of the Atlantic, but the oldest on either side. This turns out to be true. But ask yourself questions of this sort: how would you find the ages of the rocks? or how would you make a map of the rocks of the ocean floor or of Nova Scotia for that matter? Animals living in the sea die and their remains are found in the mud on the seafloor. They provide the record of evolutionary changes; it is only by the study of fossils that we can trace the rise of man from primitive organisms living billions of years ago.

### 100 Introduction to Geology, lect .: 3 hrs.; lab .: 3 hrs.; W.B. Ervine.

This is an introduction to geology for students who plan to take a degree in geology, in another science or in engineering. The course covers the

whole field of geology, from the origin of the solsystem and the Earth through Earth history to the details of the structure of the ocean floors and mountains, the ore and energy minerals of the Earth and the future responsibilities of geologist in a world suffering from increasing environment tal pressures. The lecture programme combine the results of the most modern techniques user by geologists with the practical knowledge near ed for geological mapping and rock and mineral identification, and illustration using movies and geological samples is a strong point. The laboratory course takes the student into the fire during the fall to look at the complex and i teresting geology of the Halifax area. During th winter through handling samples, student become familiar with minerals, rocks, fossils and geologic maps and also benefit from videotaper field trips to more distant parts of the province.

## 101 Introduction to Geology, lect.: 3 hrs.; lab 3 hrs. (alternate weeks); Sect. I, H.B.S. Cooke Sect. II, F.S. Medioli.

This is an introductory class for students who do not plan to major in geology but who are in terested in the subject as a science elective or as the basis for taking it as a minor. Good students in Arts should not encounter serious difficulties It covers the whole field of geology, emphasizing the concepts and ideas that make possible an interpretation of the world we live in.

### 102 The Earth and Man, lect .: 3 hrs; tutorial/ lab.: 1 hr.; Staff.

This class is designed especially for students in the social sciences and humanities. It will deal briefly with the nature and structure of the earth and its crust in order to provide background, but will not involve detailed study of rocks and minerals. Its objective is to consider the influence of geological factors on man's history and upon economic, social and political decisions of the past and future.

103B Introduction to Geology, Lect.: 3 hrs. Lab.: 3 hrs.; G.C. Milligan.

This is a half-class in Geology designed for taken Physics 110 (or equivalent), Mathematics 100/101 (or equivalent) and Chemistry 110. One purpose of the course is to show students in civ and mining engineering the principles of physica geology which apply in planning and design of mining and civil engineering works, and to troduce them to historical geology. This designed as a service class for students engineering, and is not normally acceptable as class introductory to an honours programme geology.

## geology

140 Introduction to Geology, lect.: 3 hrs.; lect. and demonstration and lab. one evening per week); J.W. Peirce.

This is an evening class intended, like 101, for those interested in the earth, but do not plan a career in professions involving geology. Examples from Canadian geology are stressed in this class. There are no science or Math. Prerequisites for this class. Under normal circumstances a student cannot go from this class into Geology 201, 202A or 223B, but can enter Geology 240, 241A, and 242B.

201 Introduction to Mineralogy, Lect.: 3 hrs.: lab.: 3 hrs.; M. Zentilli.

Accurate identification of minerals is one of the fundamental skills of the geologists. The laboratory of this class will be largely dedicated to learning the techniques of identification, whereas the lecture material will deal with other aspects of minerals such as their internal structure, chemical composition, mechanisms of growth, environments of formation, and importance as economic deposits.

202A Sedimentology and Historical Geology, Lect.: 3 hrs.; lab.: 3 hrs.; D.J.W. Piper.

The first part of the course concentrates on the development of sedimentary rocks; by examining modern depositional environments, and applying this information to ancient sediments. Both ancient and modern sediments are examined on field trips. The second part of the course examines the geological evolution of the North Atlantic region, especially Nova Scotia, Emphasis is placed on the interpretation of the sedimentary rock sequences.

Text: R.C. Selley, Ancient Sedimentary Environments.

223B Biostratigraphy, Lect.: 3 hrs.; Lab.: 3 hrs.; H.B.S. Cooke.

The objective of this class is to provide a broad picture of the fossil record - the record of life with emphasis on changes through time, and on students in science and engineering who have methods of interpretation of the fossil record that are useful in stratigraphy. Studies of morphology and taxonomy will, in this class, be only at an elementary level. This class, and Geology 423 are suitable classes for Biology students who do not have a 100 level class in Geology.

> 240 Marine Geology and Geophysics, lect., lab. and discussion: 3 hrs.; one evening per Week, D.J.W. Piper and M.J. Keen.

tions).

Prerequisite: any first level class in geology.

# M.J. Keen.

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.

Prerequisite: any first level class in geology.

The surface features of the earth are undergoing constant modification, and their present form is the result of a variety of erosional and depositional processes, including the action of ice. rivers, the wind and the sea. In this class, we will examine the development of the landforms of Canada, the importance of the last ice age, and the erosional processes still taking place today. We will examine the appearance of these landforms in conventional, aerial, and satellite photographs, and in maps.

Prerequisite: any first level class in geology.

310 Igneous and Metamorphic Petrology, lect.: 3 hrs.; lab.: 3 hrs.; D.B. Clarke/G.K. Muecke.

The mineralogy and texture of rocks are the products of their environment and mode of formation; thus macroscopic and microscopic investigations of these rocks provide clues to the conditions prevailing at the time of their formation.

### This class presents the new ideas concerning the earth that have developed in recent years, largely through studies of marine geology and geophysics. It also attempts to show the range of marine geological work, and its relevance to other fields of science, as well as engineering, economics and politics. There is one day-long cruise on a Saturday or Sunday. The class may not be taken by students majoring in geology; it is suitable for students who have geology as their minor; and those who would simply like a second class in geology (including high school teachers, or interested professionals at government institu-

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241B Environmental Geology, lect., lab. and discussion: 3 hrs.; one evening per week,

242A Geomorphology, lect., lab. and discussion: 3 hrs. one evening per week; D.J.W. Piper and H.B.S. Cooke.

Igneous rocks will be discussed under such topics as mineralogical and chemical classification, methods of depicting chemical data, mechanisms of magma evolution and comagmatic provinces.

The mineralogical, textural and chemical changes in igneous and sedimentary rocks as a result of metamorphism will be discussed in the second term. Stability relations of minerals and mineral assemblages under varying temperature-pressure conditions and the concept of metamorphic series will be stressed.

311A Field Methods, lect.: 3 hrs.; lab.: 3 hrs.; G.C. Milligan and staff.

This class is an introduction to field techniques useful to the practising geologist. Approximately half the work of the class deals with elementary surveying techniques, including the use of transit, plane tables, photogrammetric methods, and surveying astronomy. The other half deals with geochemical and geophysical exploration methods, such as gravity, magnetic, and seismic surveys. The field camps conducted at the end of the second year and the beginning of the third year are considered to be inegra! parts of this class.

### 312B Principles of Stratigraphy, Lect.: 3 hrs.; lab.; 3 hrs.; P.E. Schenk.

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 paleogeographic reconstruction. The scale of the layers varies from the millimeter-thick layers of stratified sediment to continental blocks and ocean-floor plates, whether of sedimentary, metamorphic, or igneous rock. Establishment of time-surfaces within this rock is essential for interpretation of complexes of depositional environments - the paleogeography. The purpose of the ocurse is to show how rock may be attacked for such reconstruction whether for scientific, cultural, or economic purpose.

The first five weeks deals with stratigraphic principles, such as vertical variability, classification and nomenclature, lateral variability, and correlation techniques. The remaining eight weeks apply these principles to the geologic record. North America appears to have both gained and lost segments to other continents; therefore, some analysis of these other continents is necessary to explain the geologic evolution of Canada. Within this segment, four weeks are concerned with continental sequences, and the remaining four with mobile zones, including the Appalachian-

Mauritanide (Africa), and Hercynian-Caledonia (Europe) belt, and the Cordillera.

Laboratory assignments involve statistical and stratigraphic map problems aided by the com puter. Although statistics and machine-aids and introduced, some prior knowledge is helpful

This class is suitable for those specializing sedimentary rock, but especially for those other areas of earth science, general cours B.Sc., and emphatically earth science teachers

313A Physical Properties of Rocks, lecthrs.; lab.: 3 hrs. every other week; PL Reynolds.

To understand quantitatively the present mineralogical, lithological and structural state the Earth's crust we need to know something of the physical properties of rocks. For example knowledge of the heat capacity of a recent emplaced granite batholith, and the thermal con ductivity of the country rock, will allow us to estimate the temperatures and times needed to produce the observed thermal aureole about the batholith. This example indicates that the course is not a dry catalogue of numbers, but is aimed a showing how specific rock physical properties measured in the laboratory or the field, can be us ed to train the geologist to replace inspired quesses by reasonable quantitative estimates in assessing the phenomena he observes.

### 314B Structural Geology, lect.: 3 hrs.; lab.: hrs.; G.C. Milligan.

This class is an introduction to the behaviour of rocks during deformation. It stresses th geometrical aspects of rock structures of th dimensions of those normally encountered by the exploration geologist, and their interpretation The laboratory involves exercises in the constru tion and interpretation of geological maps and designed to develop skill in the interpretation structures in three dimensions, and in th graphical representation.

(Apporximately one-half of the laboratory time) Geol. 313A will be devoted to the exercises of th class.)

### **420 Thesis**

The B.Sc. thesis may be counted as a class in I normal geology programme. Special regulation govern this, and the student should consult the undergraduate advisor.

421B Siliclastic sedimentology, lect.: 3 hrs lab.: 3 hrs.; D.J.W. Piper.

## geology

This class will examine the physical processes of transport of granular sediments, and the transport and deposition of clays. This information will be integrated in a study of modern and ancient littoral and continental shelf sedimentation. In the lab, techniques for analysing and interpreting unconsolidated sediments will be learnt. (The content of this class changes substantially from year to year.)

prerequisite: 202A. Students will find 312B, 313A and Oceanography 512A provide useful background material.

A22A Carbonate Petrology, lect. 2 hrs.; lab.: 3 hrs.; P.E. Schenk.

sedimentary rock consists of siliclastics (Geol. 421B and authigenic suites. This course deals nrimarily with depositional and diagenetic environments of carbonates, although other authigenics such as sulfates and chlorides are also reviewed. Carbonates are forming now in both the most beautiful, and also the harshest environments on earth. These environments are distinctive in their reliance on life - both plant and animal. The authigenic suites are of prime importance economically because they act as reservoirs for petroleum, natural gas, groundwater, and ore deposits (as at Gays River).

The course 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 environments as Grand Bahama Bank, Bermuda, Florida and Cuba (humid environments) and the Persian Gulf and Western Australia (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.

Text: Bathurst, Carbonate Sediments and Diagenesis, paperback edition, 1975.

## 423 Systematic Paleontology, lect.: 2 hrs.; lab.: 3 hrs.; F.S. Medioli.

This class comprises a systematic survey of the major phyla of fossil organisms. The emphasis will be on morphology and taxonomy of invertebrate phyla, including microfossils. The purpose of this class is primarily to enable the student to recognize at sight the members of the various phyla. However, it is intended also that he should learn how to tackle invertebrate fossil material so as to classify it accurately when the resources of a library and museum are available.

Prerequisite: Geology 201 and 223B or Biology

classes.

424 Advanced Mineralogy and Petrology, lect.: 3 hrs.; lab.: 3 hrs.; F. Aumento, D.B. Clarke, G.K. Muecke.

This course is subdivided into three parts. The first deals with some advanced techniques of mineralogy, including use of the universal stage, X-ray diffractometer and electron microprobe. In this section will also be discussed the crystal chemistry of the main rock-forming minerals. The second part deals with current topics of interest in the petrogenesis of igneous rocks. The origin of certain magma types will be considered in the light of recent information from the fields of experimental petrology, geochemistry, isotope geochemistry, and geophysics.

Topics in metamorphic petrology will generally include: metamorphic rocks as equilibrium systems; the role of fluids in metamorphism; metasomatism and mass transport; kinetics of metamorphic processes. Laboratory projects and special topics will be chosen to suit the student's interests.

# W.B. Ervine.

The first term of the course will deal with general problems in geochemistry. The abundance of the elements and their distribution in the solar system, lithosphere, hydrosphere, and atmosphere will be investigated. The emphasis will be on demonstrating how principles of crystal chemistry, thermodynamics, solution chemistry, etc. can be applied to geological problems.

In the second term environmental and exploration geochemistry will be stressed. Geochemical surveys, exogenic element dispersions and the origin and evaluation of geochemical anomalies will be discussed in detail.

In the laboratory the student is introduced to methods of rock and mineral analysis and will be exposed to classical, spectrophotometric, flame photometric, atomic absorption, X-ray fluorescence, microprobe and neutron activation analysis.

Prerequisites: Geology 201 and 310, or a good background in Chemistry. Students wishing to take this class should have a good background in either geology or chemistry and should consult the instructor before registration. Note that this class may be taken by students with a good background in Chemistry who have taken no previous geology classes.

2000 or Biology 3321. Note this class is suitable for Biology students without previous geology

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# 425 Geochemistry, Lect.: 3 hrs.; lab.: 3 hrs.;

## 426 Hydrogeology, lect.: 3 hrs.

This class studies the occurrence, movement and distribution of water, as related to earth materials, with emphasis on the exploration, development, utilization of groundwater and related environmental issues.

The class work includes the principles of groundwater flow, aquifer hydraulics, water chemistry, hydrologic systems, i.e. groundwater-surface water interactions, and digital modelling. Problems regarding the groundwater flow system and natural and artificial contaminants will be discussed, including such items as solid waste disposal, land use relationships and contamination due to de-icing salts, oil and gas, fertilizers, pesticides, herbicides, and other pollution sources. The disruption of the natural groundwater flow system due to construction works will also be examined. Problems, literature reviews and assignments on special topics are an integral part of the class. Reference texts and pertinent periodicals for reading will be announced.

427B Applied Geophysics, lect.: 3 hrs.; P.H. Reynolds.

This is a course in exploration geophysics which will expand on material offered in parts of 311A (Field Methods) and 312A (Physical Properties). Topics will include: seismic interpretation theory, potential field theory, reduction and interpretation of gravity data, reduction and interpretation of magnetic data, electrical prospecting methods, electromagnetic induction theory, methods and interpretation.

Assignment will be project-oriented and will attempt to involve the student in interpretation of realistic geophysical data via computer simulation, model laboratory experiments, etc.

428B Marine Geophysics, lect.: 3 hrs.; lab and occasional trip on small boat to be arranged.

We study the principal techniques used by geophysicists working at sea, and some of the principal results obtained concerning the structure and evolution of the ocean basins.

The main topics considered are: navigation, sounding, seismic refraction and reflection at sea, gravity at sea, magnetic field measurements at sea. A background equivalent to Geology 427B or the first half of Geology 429, Mathematics 100/101 and Physics 110 will be assumed.

429 Solid Earth Geophysics, J.M. Hall, C. Beaumont (Oceanography).

This course is essential for geology, or physics

students who intend to be geophysicists. The course covers the physical state and behaviour of the Earth as a whole, and shows how geo. magnetism, Earth electrical conductivity, earth quake seismology, study of the gravitational field and of the loss of heat from the Earth yield our present detailed picture of the Earth's interior while the methods of absolute age determination and other isotopic studies together with paleo. magnetism allow us to follow aspects of the Earth's evolution to its present state. Taught con. currently with Physics 445. A good grounding in math and physics is a prerequisite and registration for the course requires the consent of the in. structor.

430 Economic Geology, lect.: 3 hrs.; lab.: 3 hrs.; M. Zentilli.

The search, analysis and exploitation of geologic bodies and materials that can be utilized profitaby by man, including metals, nonmetallic minerals and fuels are the concern of a large proportion of professional geologists. In this class, many concepts of geology are brought together to explain the nature and distribution of their genesis. Ore associations are analyzed within their detailed and regional geological environments, taking into account relationships with petrological, stratigraphic, structural and geomorphological parameters, including the unifying theories of plate tectonics. Economically significant mining districts in Canada and elsewhere are used as examples. Aspects of legislation regulating the exploration and exploitation of mineral resources are covered briefly. Although metallic minerals are emphasized, some time is devoted to prob lems pertaining to the geology of fossil fuels.

The laboratories are an introduction to the methods and techniques used in the study of mineral deposits, the microscopy of opaque minerals, the writing of mine reports and element tary problems of ore reserve calculation.

A text is recommended, but a considerable volume of reading from technical journals is also required.

431A Marine Geology, lect.: 3 hrs.; lab and oc casional trip on small boat to be arranged M.J. Keen.

We study the principal techniques used b geologists working at sea, and some of the pri cipal results obtained concerning the geology the ocean basins. We look at this geology fro the point of view that the ocean basins are depre sions created as igneous rocks form at mid-ocea ridges: these depressions are filled by sedime from the continents, and by sediment of bioger origin. The distribution of sediment is dominate

# geology

therefore by the interacting effects of the creation of ocean basins, and the properties of the water masses of the oceans themselves. A background equivalent to 300 level classes in Geology will be assumed; students without this level of geoassume the instructor.

432 Advanced Structural Geology, lect.: 3 hrs.; G.C. Milligan. inas in all of north over e dris

By means of one or two projects, this class will investigate the tectonic history of selected regions as a means of study of the processes involved therein. To some degree this also involves the apnication of the student's knowledge of stratigraphy and other aspects of geology.

the class is taught as a colloquim and participants will be required to do considerable reading from the relevant journals.

### Seminars

A department seminar is held once a week. Other specialized seminars are arranged on an ad hoc basis.

### Graduate Classes

some graduate classes may be suitable: examples are Micropaleontology and Pleistocene Geology. Please consult the Graduate Calendar and seek advice from the Department.

> tems pertaining to the geology of the lutilities methods and techniques clockern mineral deposits the most scope manerals, the writing of mine sparts invureblams of ore reserve onicidial

### german

## German

Professors J. Doull F. Gaede

Associate Professor D. Steffen

Assistant Professors J. Lowry A. Roulston H.G. Schwarz

Lecturer G. Josenhans

Special Lecturer Colin Starnes

German studies are the investigation of German culture and its place in the formation of the modern world. By concentrating on significant aspects of the literary and intellectual culture of the Germanies, the Department, far from following an idle interest in the past, aims to understand the nature of our contemporary world.

Many Canadian students take German to become fluent in one of the more useful languages. German is generally understood in Central and Eastern Europe. German is also needed in many fields of study, such as Classics, History, Music, Philosophy, Religion, and the social and natural sciences.

The literary and intellectual culture of the Germanies is immediately present to us in the many ways the thoughts of Karl Marx, Nietzsche, and Freud have moved men and nations to change the course of the modern world. Revolutionary Marxism, nationalism, and the influence of Existentialism and Psychoanalysis on contemporary conceptions of human freedom have led to the divisions of the modern world. As we try to overcome the divisive forces so prominent in the contemporary world we have to understand their relative truth.-We are thus led to an inquiry into the very nature of the Modern Age. The Reformation gave. the first expression to its principle: the freedom of man in and through faith. The Enlightenment of the 18th century developed this principle, but it ended with the seemingly irreconcilable opposition of man and nature, and of one man's freedom with the freedom of all other men. The German Idealists struggled with these oppositions, and they offered a resolution that appears in the music of Bach and Beethoven, in the writings of Goethe and the Romanticists, and in the philosophy of Kant and Hegel. These men of the 18th and early 19th centuries developed in the Arts, in literature, and in speculative thought a

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profound understanding of the Modern Age. The course of history since the Revolutions of the 18th century is the history of this freedom, both in the Old and New World, in the East and in the West. Revolutionary Marxism and Existentialism, in its religious and secular form, take hold of a particular aspect of freedom. By concentrating on the Age of the Reformation, the intellectual conflicts of the Enlightenment, and the literary and philosophical achievements of the Idealists, German studies aim to contribute to a profound understanding of our world.

## Degree Programmes

## General B.A. in German

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 student to take an honours degree combining German with French, Russian, Spanish, English and Greek. 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 (German 300) b) philology and linguistics (German 350) c) teaching methods (German 351) d) work in German civilization

## German Language Studies

## Introductory Classes Offered

## 100 German for Beginners, lect.: 3 hrs.; G. Josenhans, A. Roulston.

German 100 is a seminar class for beginners, and no previous knowledge other than a reasonable background of English grammar is required. Its equivalent is two years of German in high school with a final mark of 75% or better.

The class is taught mainly in German, emphasizes the spoken language, and provides the student with the knowledge of basic grammar.

Language laboratory work and attendance of small conversation groups is required.

The class or its equivalent is a prerequisite for all classes on the 200 level.

## 105 German Reading Course for Beginners lect.: 3 hrs.; A. Roulston.

The students will 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 English. For purposes of admission to advanced classes in German it is equivalent to German 100

150/151 Intensified German, lect.: 5 hrs.; lab 2 hrs. Not offered in 1977/78.

This class counts as two credits in one year as combines the objectives of both German 100 and 200; no previous knowledge of German is re toul demain beausy quired.

Students will spend an average of two hours a week in the language laboratory and in conversa tional classes.

## Intermediate Classes Offered

Intermediate classes are based on German 101 high school German Grade 10, 11, 12 or an equivalent basic knowledge.

A combination of German 200 and German 2 serves as an accelerated Intermediate Germa course and is designed for students who want make rapid progress in the language.

200 Intermediate German, lect.: 3 hrs.; 6 Josenhans, H.G. Schwarz, A. Roulston.

The main aim of this class is to develop a cert degree of speaking fluency as well as reading a writing skills.

Language Laboratory work is required. Small of versation classes once a week as an aid to spea ing fluency are compulsory.

201 Scientific German, lect.: 3 hrs.: Roulston.

This is primarily a reading and translation cla designed to enable science students to scientific papers, reports, and articles in sci tific journals in the original language. A read

## german

knowledge of German is a prerequisite for many ph.D. degrees.

prerequisite: German 100 or equivalent.

### 202 Exercises in Translation and Composition, lect.: 2 hrs.; G.Josenhans. Not offered in 1977/78.

English and German texts from various periods of different types will be translated.

These translations will 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 will be conducted mainly in German.

prerequisite: German 100 or equivalent.

Advanced Classes Offered

Advanced classes are based on German 200 or any equivalent knowledge. to advitate

203 Advanced German, lect. 3 hrs.; G. Josenhans.

dents with spend, an average of to Readings and discussions will promote fluency in the language.

Prerequisite: German 100 or equivalent.

## Study of German Literature

210 Bertolt Brecht and the Tradition of Drama, lect .: 2 hrs.; F. Gaede. Not offered in 1977/78.

215 Goethe's Faust. Lect .: 2 hrs.; J. Lowry. Not offered in 1977/78.

Quinted distantiates Conneg. A lecture and seminar class on Goethe's Faust Parts I/II) - a literary work in which a total world view is expressed in language both beautiful and appropriate. Students may, if they wish, study independently another work, such as, Homer's Odyssee, Kazantzakis' Odyssee, Mann's Doktor <sup>raustus</sup> and Hesse's Magister Ludi (Glasperlenspiel) in relation to the Faust text.

German 220 Introduction to German Literature lect .: 2 hrs.; H.G. Schwarz.

study is made of texts representing major Periods of German Literature since the 18th cenuy. Special emphasis is given to the interaction between literature, society and the other forms of The class also serves as an introduction to erary crticism.

This course will be taught in German.

310 German Literature and Thought from Reformation to Enlightenment, lect.: 2 hrs.; F. Gaede. Not offered in 1977/78.

The class studies 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. Not offered in 1977/78.

A study is made 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. Not offered in 1977/78.

This class will study the plays of Bertolt Brecht and selected prose texts of Kafka and Thomas Mann.

335 Goethe, Hegel and the Ancients, Sem. 2 hrs. Not offered in 1977/78.

Study of German Culture Aesthetics, Philosophy, Religion

230 In pursuit of Freedom: from Luther to

Beginning with an examination of both the Notion of Freedom and the Principles of the Modern World, the course aims to investigate the peculiar form of Freedom in the modern world.

235 Germanic and Greek Mythology, Lect.: 2 hrs.; J. Lowry.

All people have myths. Through them they first grasp the origin of the world, the order that governs it and their destiny within it. In this course we will study the two main forms of western mythology - the Greek and Germanic and the relation of religion and secularism in the modern world to myth.

240 Luther and Kierkegaard: Faith, Enlightenment and Modern Secularity. Not offered in 1977/78.

## 117

Nietzsche. lect.: 2 hrs.; J. Lowry.

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As against the Ancient and Medieval Worlds, the modern world takes its rise in Luther's doctrine of "justification by faith alone". Beginning with a study of the implications of this teaching in Luther's work, the course deals with Kierkegaard's treatment of faith in the light of the modern secularity which developed from the Protestant principle, and of his criticism of German Romanticism and Idealism as an inadequate and perverse realization of that principle.

245 Kant and the history of German Idealism Sem. 2 hrs.; D. Steffen. Not offered in 1977/78.

A study of Kant's relation to modern Rationalism and Empiricism, and an inquiry into the principle of Idealism.

330 Seminar on the Philosophy of Kant, 2 hrs.; D. Steffen.

A study of the three critiques.

349 Heidegger and German Idealism Sem.: 2 hrs.; J. Lowry. Not offered in 1977/78.

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 German/345 Classics, Hegel's Philosophy of Nature, J.A. Doull, W.J. Hankey. Not offered in 1977/78.

Hegel's Philosophy of Nature and its relation to ancient physics and modern science. The course 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.

350 Marx and German Idealism Sem. 2 hrs. R. Friedrich

410 Aesthetic Theories, seminar, 2 hrs.; F. Gaede.

420 Seminar on Hegel's Phenomenology of Spirit, 2 hrs.; D. Steffen. Not offered in 1977/78.

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.

1 761 199

425 Studies in German Idealism, Seminar on Ancient and Modern Dialectics. J. Doull.

### Graduate Studies

The department offers a graduate programme leading to the M.A. degree. Details of the MA programme are given in the Calendar of the Facul ty of Graduate Studies.

## health education

## Health Education

HE412 Human Sexuality and Educating about It, lect. and discussion: 3 credit hrs.; normally Spring; E. Belzer.

### This class is concerned with basic knowledge and understandings regarding biomedical, psychosocial, historial, 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.

prerequisite: Permission of the instructor.

## history

History

## Professors P. Burroughs M. Cross J.E. Flint

P. Fraser H.S. Granter R.M. Haines G.R. MacLean P.B. Waite J.B.Webster

## Associate Professors

C.B. Fergusson J. Fingard P.D. Pillay (Chairman) M. Reckord L.D. Stokes

## Assistant Professors

J.E. Crowley J.F. Godfrey G.S. Kealey J.T. O'Brien hi montal and represented N.G.O. Pereira D.A. Sutherland G.D. Taylor

A sense of history is a primitive need felt by individuals and by groups. Just as a person needs to know who he is and how he arrived where he is, human groups, races, classes, states and nations need a sense of their own past as part of their culture. This primitive sense of history is revealed in myths and legends, when peoples embroider what has come to them from the past to create a comfortable set of beliefs about their own previous exploits and origins. There are still those who wish to use history in this way, as a means to soothe doubt and demonstrate the essential rightness of their own beliefs.

The academic study of history, however, 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 in 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

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## History as a Subject for Study at University

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.

History is the study of how and why changes in human life occur, and with what results.

## Aims of Teaching and Study

Many students entering university history classes have difficulty in adjusting to the university levels of study. The ability to repeat what has been heard in lectures and to memorize events which fall between dates at the end of the class title is of little value. Students should understand the nature of the problems which have been studied; they should also command the knowledge which has been gained, in the sense of being able to arrange it in significant patterns and to allow ideas to be tested against such knowledge.

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; he learns to think for himself.

At all levels of study in history, students are guided through lectures and tutorials and encouraged to read books and articles which consider the same problems from different viewpoints. Dalhousie has an excellent collection of historical literature and the Killam Library provides students with good conditions for private study and reading. Students are encouraged to acquire gradually a small, well-chosen personal library from the large number of excellent books published in paperback form.

## Degree Programmes

Classes in history are set out below. There are several levels of study. 100-level classes are primarily for first-year students; 200-level classes treat broad geographical areas over specified periods; and 300/400-level classes provide opportunity for specialized study and advanced work for the undergraduate.

The Department appoints advisors to counsel students. Before registration students should consult the departmental advisors concerning their programme of study and should secure departmental approval for admission to the particular classes they wish to take.

## 1. General Degree Programmes

Students who wish to major in history choose a

100-level class and at least five or six and no more than eight upper-level classes, of which two or three should be at the 300-level. First-year students may take two 100-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 in an cient history from the Classics Department, in economic history from the Economics Depart. ment and in contemporary history from classes offered in Political Science. The Biology and Physics Departments also offer a class in the history of science. Such classes are listed in the Calendar under the heading of the department concerned.

## 2. Interdisciplinary Programmes

Mediaeval Studies Programme. African Studies Programme (for details consult the Department). Canadian Studies Programme.

## 3. Honours Degree Programmes

Students may choose from several honours programmes:

European: A selection of classes in Mediaeva Early Modern, and Modern European history with emphasis, if desired, on the national history of a European country.

North American: A concentration of classes in the history of Colonial North America and in Cana dian and United States national history.

African: Classes in African history may be combined with classes in British colonial history.

British and British Imperial: A concentration of classes in the history of England and of the British Empire and Commonwealth.

General: A wide selection of classes from Nor American, British and Imperial, African and Euro pean history.

All programmes include related studies language, literature, philosophy, economics and political science.

## Classes Offered at the 100 Level

## 103 Europe in the Two World Wars; G MacLean.

This course examines the causes, course aftermath of the two World Wars as they relate European political history in the first half of twentieth century. In addition to a review of major political movements of the period, the will be a close examination of the role a

## history

character of key individuals such as Hitler and churchill. While this is not a course in military history as such, major strategic and tactical developments will be studied in some detail. Lectures will concentrate on some of the lesser known aspects of the wars (for example, the nalkan intrigues of 1914 in World War I and the underground resistance to the Nazis in World War In Students will be expected to gain their general knowledge of the period through a text to be assigned. Lectures will be supplemented by selected readings and the frequent use of audiovisual material.

120 History of Canada, lect.: 3 hrs.; P.B. waite.

This class will cover the development of Canada from prehistoric Indian cultures to Pierre Trudeau. It will have a central core of social and political history, but will range across economic history as well as Canadian literature. This is history for people who like Canada.

140 Europe and the Third World. Lecture/tutorial, 3 hrs., J.E. Flint.

This class introduces students to university level work in history. It 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 — India and Africa. For each unit there are lectures and tutorials, and students write an essay each month in class time on each unit. The written work is then discussed in tutorials designed to improve the quality of the analysis and writing.

## 199 Problems of Historical Study and Writing, seminar 2 hrs.

This class is for first-year students only. It is inlended to introduce the student to the problems of historical study, including the nature of historical evidence, how problems are analyzed, what is meant by such concepts as "causes" and results", and especially how the student can learn to think for himself about historical problems and to express his thoughts in carefully organized written work. No lectures take place; instead, each student registers for a section dealing with the type of history which interests him. 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 parlicular problems in a field of special interest to the student. This is history for people who like

### history.

Some of the sections that may be offered: 199/1 Community and Conflict in Colonial America, J.E. Crowley. 199/2 Indians in the Maritimes, 1600-1900, J. Fingard. 199/5 Mediaeval Life and Thought, R.M. Haines. 199/6 Blacks and White, 1496- 1970, M. Reckord. 199/7 Facism and Nazism, L.D. Stokes. 199/8 British Imperialism and Nigerian Nationalism, 1800-1970, J.B. Webster. 199/9 Canada, 1835-1935: Gentlemen versus Rebels, D.A. Sutherland. 199/10 America and the Cold War, 1940-1970, G.D. Taylor. 199/13 (new section): From Artisan to Worker: Topics in Canadian Working Class History, G.S. Kealey. 199/14 Impressions of the Russian Revolution, N.G.O. Pereira 199/15 The City in American History, J.T. O'Brien.

History 100, 103, 120, 140 199 provide appropriate preparation for 200-level classes.

# European History

Within a broader framework the class will give particular attention to the Age of Charlemagne, The Twelfth-Century Renaissance, and the concept of decline in the context of the Later Middle Ages.

This class studies the following topics in European history, 1500-1800: the Reformation and Counter-Reformation, economic and cultural expansion overseas, social structure, and reactions to political centralization. The readings include writings and biographies of religious reformers, Europeans' first-hand accounts of exploration and colonization overseas, documents (such as diaries, leases, marriage settlements, population statistics) which reveal social organization within particular communities, and a juxtaposition of early modern political theory with historians' accounts of political change.

### 205 Modern Europe, N.G.O. Pereria, L.D. Stokes.

This class discusses selected topics in European history between the French Revolution and the end of World War II. Among these are France during the revolutionary and Napoleonic era; the In-

Classes Offered at the 200 Level

200 Medieval Europe, lecture/discussion/tutorial sessions; 2 hrs.; R.M. Haines.

201 Early Modern Europe and Its Expansion Overseas, tutorial: 2 hrs.; J.E.Crowley.

dustrial Revolution in Britain and on the continent; Marxism and the revolutions of 1848: Darwin, Freud and modern science; the First World War; the Soviet Union under Lenin and Stalin; and Facism and Nazism between the wars. For each topic, there will be one week of general and a second week of specialized readings, followed by a week devoted to student projects. There will also be several guest lecturers during the year. Attendance and active participation in all sessions are required. One section of the course will be given in the evening.

## British and British Imperial History 210 The History of England, lect .: 2 hrs. plus discussion groups, H.S. Granter.

The main features of English history, from Anglo-Saxon times to the present are given selective treatment and put in historical focus. The emphasis is on the development of a society and culture which, though similar to Western European, has its own particular and peculiar characteristics.

213 British Empire and Commonwealth, lecture/discussion: 2 hrs.; M. Reckord, P.D. Pillay.

This class examines a series of 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 will be discussed. A section of this class may be given in the evening.

## North American History

220 A People at Work: Social and Economic History of Canada, lecture: 1 hr.; discussion: 2 hrs.; G.S. Kealey, M. Cross.

A broad perspective on Canadian social and economic development, from New France to the 1950's, this course will consider such themes as social classes and social conflicts, immigration, the role of women, organized and unorganized labour, and the processes of economic change. There will be one interpretative lecture and a twohour seminar each week.

221 A People At Work: Social and Economic History of Canada, lecture/seminar, 2 hrs.; D. Frank, N. Reilly

The themes of this evening session parallel those of History 220 concentrating on the economic and social development of Canada in the nineteenth

and twentieth centuries. The Atlantic region will receive special emphasis throughout the year in both the lectures and seminars.

## 222 Canadian Economic History, lect.: 3 hrs. (for details see Economics 232).

227 The Atlantic Provinces, lecture/tutorials 3 hrs.; D. Sutherland, J. Fingard.

Through a combination of lectures and tutorials students will be offered a survey of Maritime and Newfoundland history from the beginnings of European penetration to the "triumph" of Cana dianization. Attention will be given to the interaction tion of environment and culture which has given rise to a durable but nevertheless vulnerable regional character. The course will seek to define internal patterns of social change and social con flict while simultaneously placing regional development within a broader national and inter national context. Enrollment in 1976/77 is limiter to sixty students.

## 230 American History, lect.: 2 hrs.; J. O'Brien, G.D. Taylor.

The focus of this course is on the emergence an American society and economy and the impart of these developments on political ideas and stitutions. Within this framework certain base themes and issues will be examined, such a how did regional differences in social and economic arrangements affect the way in which people viewed one another in the British imperi system, and later the American nation? Ho closely did ideas about American social equal and economic opportunity reflect the realities the emerging society? How did the rise of an dustrial and urban nation alter the values at ways of life of a people whose traditions we shaped in small towns, city neighborhoods a rural communities? The course will emphase basic changes and tendencies in America history.

## 242 Tropical Africa Before 1800, ture/tutorials; 2 hrs.; J.E. Flint.

This class examines the themes and problem African history before 1800. It begins with discussion of the origins of man in Africa, and emergence of ethnic and linguistic groups. coming of agriculture, iron technology and distance trade will be discussed in relationsh the formation of the medieval civilization of west savanna. Other themes include the exp sion of the Bantu, the creation of kingdoms, the impact of the Portugese, at effects of the slave trade on African societies

## history

245 History of Tropical Africa in the Nineteenth and Twentieth Centuries, lecture/ tutorials: 2 hrs.; J.B. Webster.

In lectures and tutorials students will be enabled to grasp and absorb some of the major themes of African pre-colonial history by a study of the internal politics and developments of African states and societies such as the Yoruba empire, Ashanti and Dahomey in West African, and African states like Buganda around the East African great lakes. The theme of cultural contact and its effects will he prominent in considering Muslim revolutions in West Africa, and Arab penetration in East Africa, as well as the impact of Christian missionaries in both areas. The second term will deal mainly with the impact of European colonial rule; the partition of Africa, the establishment of differing types of European rule; and African responses, resistance and nationalism which culminated in the emergence of independent African states.

## Classes Offered at the 300 Level

300-level classes in history are intended for thirdyear students who have completed work at the 100 and 200 levels. In general, these classes are concentrated in area and time and allow students to pursue interests developed in 200-level classes. The Department will probably be offering additional 300-level classes, details of which will be available at registration.

European History 300 Mediaeval Civilization, discussion/ tutorial: 2 hrs.; R.M. Haines.

History 200 provides the appropriate background for this class. Each year a number of topics is chosen, wide enough to be used as central themes in the context of which mediaeval civilization can be studied; for instance, monasticism, universities, papal government, and architecture. Such topics will be studied in depth, with the help of original documents (in translation) where these are available, and using periodical literature. Students are expected to master the basic work in certain areas, but will also be encouraged to develop special interests of their own. Class discussion will be used to unravel more difficult aspects, and all students will be expected to conubute in this way and in the writing of a small humber of well argued and documented papers. Some general books should be read before star-

ing the class. Suggestions of this kind, with a list of the topics and appropriate explanation and bibliography will be available well in advance.

<sup>302</sup> The Mediaeval Church, discussion/

This class will cover the period 1917-1964. Beginning with the Great October Revolution of 1917 it will follow the course of Soviet power through the Civil War and War Communism, N.E.P., Collectivization and the Five Year Plans, the Purges, the Cult of Personality, the struggle against Fascism, Reconstruction and the Zhdanovshchina, De-Stalinization and the Thaw, ending with the fall of Krushchev. Seminar format: readings, discussions, papers and optional exams.

1976/77).

306 Modern France from the Revolution of 1848 to the Collapse of 1940, seminar: 2 hrs.; J.F. Godfrey. (not offered 1976/77)

History 205 provides the appropriate background for the class which examines selected topics in 19th and 20th century German history. These include German nationalism and liberalism, the role of Prussia, industrialization, the political parties and civil-military relations. Extensive reading in primary and secondary sources is required and each student will prepare a research paper during the second term. A reading knowledge of German is not necessary.

(Same as Biology 3400 and Physics 340. Class description to be found under Biology 3400.)

English History 314 England under the Tudors and Stuarts, discussion/tutorial with occasional lectures: 2 hrs.; H.S. Granter.

This class will deal with such topics as the religious reformation in England, the rise of the gentry, the age of Elizabeth, and agrarian revolution, Anglican, Catholic and Puritan, the Civil War and the restoration of the establishment, parliamentary monarchy and the rule of law, and the growth of individual liberty.

tutorial: 2 hrs.: R.M Haines.

303 European Social and Intellectual History, 1890-1914. Seminar, 2 hours, M. Gluck.

304 Twentieth Century Russia, discussion/ tutorial: 2,hrs.; N.G.O. Pereira.

305 Nineteenth Century Russia, discussion/ tutorial: 2 hrs.; N.G.O. Pereira. (not offered

307 Modern Germany, discussion/tutorial: 2 hrs.; L.D. Stokes.

310 History of Science, lect.: 2 hrs.; tutorial: 1 hr.; J. Farley, R. Ravindra.

316 England in the Nineteenth Century to 1867, discussion/tutorial, with occasional lectures: 2 hrs.; H.S. Granter.

The Nineteenth century was England's century, the Victorian Age, the time of England's greatness. The class is devoted primarily to the study of the making of Victorian England, examining the impact of new machinery and new ideas on an older agricultural aristocratic society.

## 317 Late Victorian and Edwardian England, seminar, 2 hrs.; P. Fraser

The class will examine selected aspects of political, social and intellectual history, such as the transformation of the Liberal party under pressures from Socialist groups, the Labour movement and the varied forces of Imperialism; the ideals and policies of special movements associated with temperance, social reform, imperial federation, tariff reform, women's suffrage, national service and defence; and the methods of political organization (whether of central or local government), parties, electioneering or campaigns in the press.

319 Britain in Two World Wars, tutorial: 2 hrs.; P. Fraser.

This course covers the 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, Kitchner and Lloyd George, Chamberlain, Churchill and Attlee. Attention will be concentrated on the important episodes, both political and military or diplomatic.

## North American History

324 Society, Economy, Conflict in the Canadas, 1791-1872, seminar: 2 hrs.; M. Cross.

A study of the nature of the society and economy of Upper and Lower Canada, between the creation of the colonies and the Printers' Strike of 1872, and of the social and political conflicts generated in their evolution. The themes emphasized will include: the growth of local and provincial communities; the nature and causes of political and social violence; social classes and the relations between classes; the development of political protest; women in colonial societies; preindustrial and industrial workers. Specific seminar topics will be chosen by consultation between instructor and students. Useful preparatory reading would be J.M.S. Careless, ed., Colonists & Canadiens.

325 Canada Within the Empire, 1760-1896 discussion/tutorial: 2 hrs.; P. Burroughs. (not offered 1976-77.)

## 326 The Response to Industrial Capitalism in Canada, 1850-1935, seminar: 2 hrs.; G.s. Kealey.

This seminar will study the evolution of the Cana. dian economy from 1850-1935 with a special focus on industrialization. Although involving excur sions into economic history the course will be primarily concerned not with the process of in dustrialization but rather with its social effects Most time will be spent on the working class response but attention will also be paid to agrarian and middle class responses. Considera tion will also be given to the regional nature of these developments. Students will be expected to write research papers based on primary sources No prerequisite.

## 327 The Nova Scotian Experience, 1815-1945 2 hrs.; D. Sutherland.

The first term is to be taught in a lecture/discus sion format and will survey provincial history from the Napoleonic era to the Second World War. The second term will be conducted in a seminar to mat in which student papers are presented in group discussion. Given the nature of the second term work load, students taking this course should be history majors with previous back ground in Canadian history.

## 329 The Social Outcast in Canadian History seminar: 2 hrs.; J. Fingard.

This class will examine the plight and flight of the poor and oppressed, the transient and theshur ned, fcussing in particular on the predicaments such elements in Canadian society as Indians Blacks, immigrants, sailors, navvies, the deline quent and the diseased. The emphasis will be the 19th Century and opening years of the 20 Century. A major research paper will be required

## 335 The American Revolution, seminar hrs.; J.E. Crowley.

This class studies the origins of the America revolution in imperial and provincial politics and investigates the alterations of social, economic and political life resulting from the cris Students must have command, at the class' sta of the narrative of political, military and const tional events, and a bibliography of appropria readings is available from the instructor.

336 Enslavement and Emancipation. History of Afro-Americans in the South

## history

## 1900, seminar: 2 hrs.; J.T. O'Brien.

This course begins with the enslavement of Africans in the North American colonies during the 17th and 18th centuries. It continues with tudies of slave societies in the American South during these centuries and employs studies of lave societies in Latin America and the Carribean noth to make comparisons and draw distinctions. it explores the ways in which slavery shaped the development of the larger southern society and prought about the American Civil War. Because slavery bound together in intimate and often cruel ways blacks and whites, the focus of the course empraces both racial groups: it examines white attitudes towards free and enslaved blacks and the development of racist thought; it probes the affects of slavery on Afro-American society and the creation by blacks of their own culture and society. Finally, the course sets forth the main terms of the Reconstruction process after the Civil War and studies the roles that former free Negroes and slaves played in the remaking of the South.

## 337 Slaves, Peasants and Workers: Caribbean History from 1750 to the Present; seminar: 2 hrs.; M. Reckord.

The Caribbean islands have always produced wealth; sugar, bananas and bauxite have made fortunes for the few. Consequently the Caribbean has always been an area where imperial powers have struggled with one another. But most of the people in most of the islands have remained poor most of the time. This course investigates why this situation developed and what efforts have been made to alter it. Special attention will be given to the struggles of the slaves to overthrow slavery, the efforts of the people to acheive independence and, in the case of Cuba, to make a socialist revolution.

## 339 The United States in the Twentieth Century: The Architecture of Complexity, tutorial: 2 hrs.; G.D. Taylor.

his class investigates the response of American political and economic institutions to the probems of industrialization and urbanization. Study ocuses on patterns of organization: the growth of Public and private corporate forms of bureaucacy; the emergence of new interest groups; and he impact of these developments on the tradional American political and social structure. The lass will emphasize discussion and individual esearch by the student within this general amework.

<sup>44</sup> African History from Oral Tradition, eminar: 2 hrs.; J.B. Webster.

## 345 History of South Africa, lecture/tutorial, 3 hrs.; P.D. Pillay.

History 213 provides an appropriate background for this class, or History 220 for students wishing to make comparative studies with themes from Canadian history. The class concentrates on the period since the British acquisition of Cape colony, and examines the development of relations and tensions between the English and Afrikaans speaking groups, and between the white population and other races. The main topics considered are the rise and fall of the Zulu nation, the opening up of the interior, the imperial factor and its effects on Cape and Transvaal politics of the late nineteenth century, South African Union, Afrikaner nationalism and the development of apartheid.

## 349 Studies in Decolonisation, tutorial, 2 hrs.; J.E. Flint.

The class is intended for third year students, who have taken second year classes in British, British Imperial, European, or African history. It will be conducted as a seminar, and students will be asked to make written and oral presentations of the topics to be discussed. These will be case studies of the events leading to the transfer of power from Britain to former colonial or pseudo-colonial territories. Examples will be chosen in consultation with the class, but could include Nova Scotia, the Dominion of Canada, South Africa, Ireland, Egypt, Ceylon, India and Pakistan, Palestine, Ghana, West Indian examples, Nigeria, Kenya, Uganda and Tanzania. Through comparison of case studies consideration can then be given to some general themes such as the nature and power of colonial nationalism, the decline of imperialism, the impact of the British Labour party on colonial policy, the relationship of colonial rule to economic and strategic interests, the concept of neo-colonialism, the reception of British institutions overseas, and the emergence of dictatorships and military governments.

Classes Offered at the 400 level

History 344 is designed for an elite, for those students who did well at the 240 level and who have a keen interest in African history. The course 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 course concentrates upon dating oral traditions through genealogies, eclipsereferences, famines and cross referencing.

Both History 460 and History 499 are required of fourth-year history honours students; first-year M.A. students may also attend History 460.

399 Great Historians, seminar: 2 hrs.; P. Fraser.

Examples of the works of great historians from Thucydides to the present will be considered. Schools of historiography will be identified, their characteristics examined, and their relationship to contemporary societies explored. The "history of history" will be traced, with emphasis on the emergence of the modern discipline of history in the nineteenth century with its classical writers, its theorists, and its impact on the modern world. Canadian and American historiography will be covered, according to the interests of students, as well as British and European.

## 499 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 will be related to one of their 300 or 400 level classes and will be 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

## Humanistic Studies in Science

Attention is drawn to the following classes, of fered in several departments. All of these classes are concerned with the humanistic aspects of scientific thought and its development.

History of the Sciences

Biology 3400/Physics 340/History 310, The History of Science; J. Farley, (Biology), R Ravindra (Physics). Not offered for the period covered by this edition of the calendar.

Biology 3401A History of the Biological Sciences, lect. 2 hrs.; tutorials; J. Farley.

German 345/Classics 345, Hegel's Philsophy of Nature, J.A. Doull, W.J. Hankey

Psychology 458, History of Psychology; J.W Clark.

## Philosophy of Science

Biology 3410B, Man in Nature, lect .: 2 hrs tutorials: 1 hr.; K.E. von Maltzahn.

Philosophy 365, Causation and Explanation, A Rosenberg.

Psychology 353B, Philosophy of Science and Experimental Psychology, W.K. Honig. A Rosenberg.

Religion 351, Religion and Science, R. Ravindra.

Sociology of Science

Sociology of Science

Details of the above classes will be found under the appropriate departmental listings.

# linguistics

# Linguistics

the departments of French, German and Spanish each offer classes inlinguistics, details of these classes will be found under the departmental listing.

M. Edelstein .A. Fillmore H. Radjavi R. Rosen A.J. Tingley

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Professors

E. Blum

**Associate Professors** H. Brunner

D.S. Chehil (N.S.T.C.) J.C. Clements C.A. Field L.A. Grünenfelder R.P. Gupta E.L. Heighton R. Paré S.N. Sarwal (N.S.T.C.) W.R. Smith P.N. Stewart (Chairman) W.R.S. Sutherland S. Swaminathan K.K. Tan J. Thiébaux A.C. Thompson

### Assistant Professors B. Abraham

J. Borwein K. Dunn M. Epelman J.F. Goodfellow (N.S.T.C.) C.S. Hartzman R.D. Holmes A. Jafarian L.L. Keener J. Lester E.B. Mercer J. Philips W. Schelter

Lecturers I. Fraser

K.L. Weldon

D. Gray

**Killam Postdoctoral Fellows** R. O'Brien S. Power

A. Finbow I. Raeburn O. Scalise

Degree Programmes One full credit in mathematics is required for a B.Sc. degree.

## mathematics

## **Mathematics**

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Postdoctoral Fellows and Research Associates

Mathematics is an area of concentration. Students who plan to major in Mathematics should arrange a programme in consultation with the Department.

Majors in Mathematics are required to obtain at least four Mathematics credits beyond the 100 level. Amongst these, the following are required: Math 200 (or 250 or 220), 203-204 (or 213), and at least one credit beyond the 200 level.

The Department offers courses in Applied Mathematics, Pure Mathematics and Statistics. The Mathematics Major Information Booklet contains detailed information about Mathematics programmes and career opportunities. Students may obtain a copy of this booklet from the Mathematics Department.

Those students who wish to arrange interdisciplinary programmes (with such fields as Computer Science, Physics, Chemistry, Biology, Psychology and Economics) are invited to discuss their interests with the Department.

## **Honours in Mathematics**

The following programme will normally be 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 one of the special sections of Math 100 and 101.

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 350 and six additional classes at least two of which will be numbered 400 or above.

Students may choose programmes with a concentration in Applied Mathematics, Pure Mathematics or Statistics. Further requirements will depend on the concentration chosen. All Honours programmes must be approved by the Chairman of the Mathematics Department.

# Honours Comprehensive Examination

The Honours Comprehensive examination will be a verbal presentation of a suitable topic requiring comprehensive knowledge. The topic is to be selected in January of the graduating year for presentation in March.

## **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 an propriate for many. Students contemplating combined honours course in mathematics and another subject should, however, bear in minthat the work in either subject would probably h insufficient for admission to a regular graduan programme. A qualifying year would usually be necessary.

## Classes Offered

The listed prerequisites indicate the mathe matical background expected of students enter ing any class but may be waived with the consen of the instructor.

described here. The student should consult the polar coordinates, sequences and series, Taylor 1977-78 university timetable or the department determine those classes which are given 1977-78.

# hrs. (non-credit course)

This class may be offered in place of seniry Prerequisite: Math 100. matriculation mathematics as a prerequisite first year classes at the University. Normal, No more than one credit will be given for Math junior matriculation mathematics as taught Grade XI in Nova Scotia is expected as a back ground but mature students or others who at 102 Mathematics for Liberal Arts Students, well motivated are able to cope with the workd lect. 3 hrs. this class. After a review of elementary algebra this class is intended for students who wish to functions (exponential, logarithmic and trig recome acquainted with mathematics as an art nometric) and analytic geometry are studied after than as a tool for the sciences. It will addition to preparing students for the calcula discuss some of the more elementary yet inaddition to preparing students those wishing lessing aspects of the subject with an emphasis build up their knowledge of the fundamentals much historical origins of the various topics. mathematics for other reasons.

The following two classes, Mathematics 100 Mathematics 101, are designed to introduce basic ideas of the calculus and together a stitute a solid foundation for study i Sciences, (Physics, Chemistry, Biology, nomics, etc.) as well as for further stud Mathematics.

These two half-classes are offered in both te

gramme in mathematics or some related sub tions.

## 100 Differential and Integral Calculus. 3 hrs. (Half-course)

Mathematics 100 is a self-contained introd to differential and integral calculus. The top clude: functions, limits, differentiation

# mathematics

olynomials, trigonometric, exponential and athmic functions, product, quotient and rules, applications of differentiation, anvatives and definite integrals, integration by titution.

A sequel to this class is Math 101.

sudents are expected to attend tutorials at least hour per week.

prerequisite: Senior High School Mathematics.

of Differential and Integral Calculus, lect.: shrs. (Half-course)

vathematics 101 continues the study of calculus topics including: techniques of integration, In any one academic year, the mathematic elementary differential equations and applicadepartment offers only a selection of the classer lons. Riemann sums, parametric equations and

sequel to this class is Math 200 (or 250 or 220).

001 Fundamentals of Mathematics, lect. Students are expected to attend tutorials at least

ese topics will include elementary number neory; finite and infinite sets; graph theory; coluring problems; elementary topology; topics om geometry.

erequisite: Senior High School Mathematics.

### Introductory Statistics for Nonhematicians, lect.: 3 hrs. (Half-course),

ugh extensive use of illustrative real-life ex-Students who are contemplating an honours, the student is introduced to the basic cepts of statistics: data reduction, estimation, gramme in mathematics of administration about special and hypothesis testing. These examples will be from a wide variety of disciplines. The ems of the course will be on statistical conrather than mathematical manipulations. Ourse is open to students of any year.

> principal aim of the course will be to enable ents to identify and formulate the statistical

107.

### 107 Statistical Techniques of Scientific Experimentation, lect.: 3 hrs. (Half-course).

ques.

### 110 Mathematics for Commerce and Economics, lect.: 3 hrs.

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 are encouraged to follow this course with Math

129

Topics will include descriptive statistics, elementary probability and distributions, estimation, hypotheses testing and regression.

Math 107 is a natural sequel for this course.

Prerequisite: High school algebra.

Not more than one credit will be given for Math 106-107 and Math 206.

This course extends the introduction of statistics provided by 106 to include a collection of techni ques that are widely used in the experimental sciences. Topics will include regression and correlation analysis, analysis of variance, and curvefitting techniques. The presentation of these topics will include consideration of the statistical aspects of experimental design.

The objectives of this course are:

1) to explain what information can be obtained from experiments through use of these techni-

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.

Prerequisite: Math 106.

Not more than one credit will be given for Math 106-107, 206. Students planning to take higher level statistics courses are strongly advised to take Math 206 instead of 106-107. However, students with a B- standing in Math 107 plus Math 100 may then take math 334, 335, 338 or 339.

The class provides a survey of mathematical techniques which are useful in analyzing mathematical models in economics and management. The material covered in the class is similar to that presented in Mathematics 100 and 101. However certain topics (such as Taylor's series, volumes of revolution) included in Mathematics 101 are not covered in Mathematics 110. In their place Mathematics 110 includes an introduction to matrix algebra, maximization of functions of

## two variables and Lagrange multipliers,

This class is intended as 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 as Mathematics 100/101 uses a more rigorous mathematical approach. Throughout the class, applications of mathematical techniques to economic and management problems will be stressed.

Prerequisite: Senior High School Mathematics.

## 111 Finite Mathematics for Commerce, lect .: 3 hrs. (Half-course).

This half course is designed to give the student an introduction to finite mathematics with an emphasis on applications in commerce. This course and Math 112 together satisfy the mathematics requirement in the Commerce department. Students planning to take more advanced courses in mathematics may wish to take Math 100/101 and should consult the department in this regard.

Topics include: probability theory, linear algebra, linear programming, decision theory, and the mathematics of finance.

## Prerequisite: Senior High School Mathematics.

## 112 Introductory Calculus for Non-Mathematicians, lect.: 3 hrs. (Half-course).

This course is designed primarily to fit the specifications of the departments of Commerce and Pharmacy (with different sections for each). Elementary calculus is taught and computational techniques are stressed. These technquues are extensively applied to those functions which occur most often in commerce and pharmacy; namely, power functions, exponential functions and logarithmic functions. Topics studied include limits and continuity, the derivative, the definite integral and applications of these to pertinent examples. In addition, commerce students will study functions of several variables while pharmacy students will study elementary differential equations.

## Prerequisite: Senior High School Mathematics.

Credit will be given for only one of Math 100 and Math 112.

## 128/129 Differential and Integral Calculus for the Four-Year Engineering Programme

Math 128 is a three hour per week course with two hour laboratory. It includes a review of precalculus mathematics, functions, limits, contidifferentiation and integration of polynomial ponential, logarithmic and trigonometric tions. Applications to finding areas, grand maximum-minimum problems, and physical blems are included. Several of the basic then of calculus are covered, including the Mean theorem. Vectors and complex numbers and troduced.

Math 129 is a continuation of the stud calculus. It is a four hour course with one laboratory. Topics include, techniques of tegrating, solid analytic geometry, function several variables, partial differentiation, and wath 204 is an appropriate sequel for this course. tor, calculus. Further applications to physical problems are made.

Prerequisite: Senior High School Mathematics

## 200 Intermediate Calculus, lect.: 3 hrs.

It is assumed that students taking this class already acquired some knowledge of Calcu Topics will include the following: Vector spaces, themselves readily to applications in physics matrices. engineering.

Topics include: real number systems, contin functions and their fundamental properties, a tot more than one credit will be given for Math tial derivatives and applications, double inter m204 and 213. functional determinants, geometry of Eucli vector spaces with emphasis on three dim as Projective Geometry, lect.: 3 hrs. sions, elementary differential equations.

## Prerequisite: Math 101.

Credit will not be given for more than one of the 200, 220, 228 and 250.

# Mathematics, lect.: 3 hrs.

The course consists of three parts. I. Mathematical Logic. A simple presentation cometries. The axioms are those for Projective made of the Propositional Calculus and Restricted Predicate Calculus as far as Henry Completeness Theorem.

(into, onto, 1-1), operation, relations (order, particle plane, cross ratios, Pappus's Theorem, the (into, onto, 1-1), operation, relations (or cereil adamental cross ratios, Pappus's Theorem, the total), partitions induced by equivalence relation adamental Theorem of Projective Geometry, and conversely. The axioms for Set Theory at the Introduction of Coordinates in a projectroduced to show that a Peano System exists plane, discussion of Klein's Erlangen Pro-

III, Number Systems. From the Peano Sys constructed the natural number system and is course is intended for anyone with an init the System of Integers and then the Rail in mathematics and geometry, especially Number System. The Real Number System is those who enjoy engaging in deductive structed from the Rational Number Syster Soning using decimal rationals.

# mathematics

# Prerequisite: Math 101.

203 Matrix Theory, lect.: 3 hrs. (Half-course).

ropics will include the following: solutions of of linear equations, matrices and matrix equivalence, rank, inversion, deternts, and applications of matrix techniques to her branches of mathematics as well as to ther sciences and other disciplines. An inoctain to linear algebra will be given with apications to matrix algebra.

prerequisite: Senior High School Mathematics.

Not more than one credit will be given for Math n3 204 and 213.

Int Linear Algebra, lect.: 3 hrs. (Half-course).

Conceptual aspects will be treated, while streases, dimension, linear transformations, is laid on manipulative techniques which supresentation of linear transformations by

## verequisite: Math 203.

lebegin with a brief discussion of the role of the estulates" of Euclidean geometry, especially Parallel Postulate of Euclid, and go on to me elementary theorems of Non-Euclidean metry. Some of the basic properties common the Euclidean and Non-Euclidean geometries 202 An Introduction to the Foundations investigated. We introduce axioms for metry which describe these properties and axioms are shown to be consistent and inrendent by giving finite models or finite metry.

ective geometry is then studied in detail with cs including duality, Desargues Theorem, the II. Set Theory. The basic concepts of man monic relation, algebraic models for the pro-

"quisite: Math 203 or concurrent registration

### in 203.

## 206 Probability and Statistics, lect.: 3 hrs.

This class provides a basic introduction to the concepts of probability and statistics. The subject matter will be developed systematically with an emphasis on results of an important practical nature. The course is well-suited for any student with knowledge of calculus who wants a basic understanding of statistical procedures and tests.

This class is recommended for any student with a knowledge of calculus or for any student interested in taking higher level statistics courses.

Topics include: Probability, discrete and continuous random variables, sampling, sampling distributions, estimation, tests of hypotheses, regression, analysis of variance, general experimental design.

Prerequisite: Math 100.

ing Math 206.

106-107 and 206.

### 213 Linear Algebra, lect.: 3 hrs.

This class is designed 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 course provides an excellent background for further study in Mathematics. See the prerequisites for Math 250. 302, 303, 305, 330 and 350.

Prerequisite: Math 101 or consent of instructor.

Not more than one credit will be given for Math 203, 204 and 213.

## 220 Applied Mathematics, lect.: 3 hrs.

This class is designed with the needs of science students in mind. It includes the topics: functions of several variables, vector analysis, line and surface integrals, integral theorems, differential equations, series, complex analytic functions.

Prerequisite: Math 101.

A natural sequel for this class is Math 334, 335. Math 338 and Math 339 may also be taken follow-

Not more than one credit will be given for Math

Credit will not be given for more than one of Math 200, 220, 228, 248-249 and 250.

225 Introductory Numerical Methods and Fortran Programming. lect.: 3 hrs. (Halfcourse).

This class provides an introduction to the use of desk calculators and to the Fortran computer language, which is in wide use throughout the sciences. Examples and applications are included. Particular emphasis is placed on numerical techniques appropriate to linear algebra.

Prerequisite: Senior High School Mathematics.

227 Numerical Methods, lect.: 3 hrs. (Halfcourses).

This class provides an elementary introduction to some of the numerical methods used in almost all fields of the sciences. The numerical techniques studied include those for the solution of polynomial equations, the approximation and interpolation of functions, some methods for numerical integration and differentiation and differential equations. These techniques are applied to a variety of problems chosen from the physical and social sciences. A knowledge of Fortran programming to the level of Math 225 is assumed.

Prerequisite: Math 101 and 225.

230 Introduction to Operations Research, lect.: 3 hrs. (Half-course).

This class provides an elementary introduction to some of the numerical methods which are being applied to problems in business, economics and the sciences. These methods generally determine a best, or optimal, solution to a model of the original problem. Using digital computers it becomes feasible to consider some of the actual applications of these methods.

The mathematical methods studied include optimization techniques from the calculus, solution of polynomial equations, the simplex method for linear programming and the special versions of the assignment and transportation problems, as well as methods for dynamic and random processes as in inventory and queueing problems. These techniques are applied to a variety of problems chosen from business, government and the sciences.

Prerequisite: Math 101 and 225.

248-249 Intermediate Calculus for the Four-Year Engineering Program, lect .: 3 hrs.; tutorial: 3 hrs.

Math 248 is a one-half year course concentrating

on the calculus of functions of several varia vector-valued functions of several variable infinite series. Topics include partial differ tion, multiple integrals, curl, div., grad and n series.

Math 249 continues with Green's, Gauss' Stokes' theorems, topics from ordinary diff. tial equations, topics from linear algebra topics from the theory of analytic function complex variables.

Pertinent material from earlier courses is rev ed as necessary; including, 3-dimensional tors, continuity and limits, methods of int tion.

Prerequisite: Math 129.

250 Introductory Analysis, lect.: 3 hrs.

Mathematics 250 is an approximately par course to Mathematics 200 and is designer honours students and other serious student mathematics. This course forms the first half 2 year sequence in analysis and advan calculus; Mathematics 350 completes the quence.

Topics included in the course: Real and Com series.

Prerequisite: Good standing in Math 101 and a Math 300. current registration in Mathematics 213.

Credit will not be given for more than one of l 200, 220, 228, 248-249 and 250.

254 Basic Set Theory; lect.: 3 hrs. course).

This course is intended as a simplified intro tion into basic topics of set theory. Ma discussed will include: sets and relations, cotable and uncountable sets, cardinality in gene partial order, maximal and minimal eleme functions and operations on them; element topics.

Prerequisite: Consent of instructor.

260 Theory of Interest, lect.: 3 hrs. [" course).

This course will examine in detail the theo simple and compound interest. The syllabu simple and compound interest. The theory a In this first course in abstract algebra the follow-

# athematics

vest portion of Exam 3 in the Society of Acexamination series is based. Some of the discussed are: nominal and effective rates prest and discount, force of interest, anperpetuities, price of bonds, callable special topics.

sourse should appeal to students in mematics, economics and commerce. udents interested in an actuarial career should this course and are urged to consult the artment for guidance in course selection and ional information. The sequence Math 225A an 260B is suggested as good preparation for an 3 in the Society of Actuaries examination res. Sequels to this course may be available in uture years.

prerequisite: Mathematics 101 or 110.

Advanced Calculus, lect.: 3 hrs.

Functions of several variables, continuity. difterentiation, implicit differentiation techniques. ravior's expansion; Jacobians (their geometric meaning). Implicit function theorem; extreme alues; multiple integration (especially transformation of double and triple integrals), line and numbers, Set Theory, elementary topology surface integrals. Green's and Stokes' theorems; Euclidean Space, limits and continuity, difference of functions; uniform convergence; Fourier tiation of functions of several variables, series (sine and cosine series; convergence Riemann' integral, line and surface integrationers). Applications: boundary value prob-Green's, Gauss' and Stokes' theorems, por lems, partial differential equation's. Students who ntend to honour in mathematics, or do graduate work in mathematics, should take Math 350, not

Prerequisite: Math 200.

No more than one credit will be given for Math 00, 328, 350,

102 Set theory and Foundations of Analysis, ect.: 3 hrs. (Half-course).

his course concerns the basic objects of mainematics and the proper way of dealing with minity". It is essential for a clear understanding most modern aspects of mathematics. The topics for discussion include: operations with topology of the real line, continuity and reasts, countable and uncountable sets, cardinal mbers, Ordered sets, Well-ordering, Ordinal <sup>bers,</sup> Axiom of choice and its equivalents, and axiomatics in set theory.

<sup>Equels</sup> to this course: Math 304, 332.

<sup>requisite</sup>: Math 200 and 213 (or 204).

303 Abstract Algebra, lect.: 3 hrs.

nectedness.

305 Differential Geometry and Tensor Analysis, lect.: 3 hrs.

and connexions.

course).

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.

Prereguisite: Consent of instructor.

course).

cients.

## 133

ing topics will be treated: groups, sub-groups, factor groups, homomorphisms, rings, ideals, euclidean domains, polynomial rings, and fields.

This course is a good sequel to Math 204 or 213 and leads to Math 403.

Prerequisite: Math 204 or 213.

304 Metric spaces and elementary topology. lect.: 3 hrs. (Half-course).

The topics discussed in this class will include: Metric Spaces, examples. Bounded, totally bounded, compact and complete sets in metric spaces. Lipschitz and contraction mappings. Topological spaces, examples, open and closed sets, bases. Continuity, compactness, con-

Prerequisite: Math 200 and 213 (or 204);

The material presented in this course will consist of two parts. The first part will discuss the theory of curves and surfaces in three-dimensional Euclidean space. Topics treated will 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 will consist of an introduction to Riemannian Geometry and, if time permits, an introduction to general relativity as an application of Riemannian geometry. Topics treated will include: Foundations of tensor calculus, differentiable manifolds, foundations of Riemannian geometry, absolute differentiation

Prerequisites: Math 200, and 213 (or 203 and 204).

307 Theory of Numbers, lect.: 3 hrs. (Half-

Properties of binomial and Q-Binomial coeffi-

311 Differential Equations, lect.: 3 hrs. (Half-

One of the aims of this course is to give the student 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 course 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 area of interest.

Prereguisite: Math 200 ...

312 Differential Equations, lect.: 3 hrs. (Halfcourse).

The topics discussed in this course are of great importance to any student interested in applied mathematics. Areas treated include Euclidean spaces, Fourier series, orthogonal polynomials, Sturm-Liouville problems, the classical partial differential equations, and some applications to physics, chemistry and engineering.

### Prereguisite: Math 311.

### 320 Introduction to Numerical Analysis. lect.: 3 hrs.

One aim of this class is to derive efficient methods for the numerical solution of problems from various branches of mathematics. The other, more important aim is to provide an understanding of these methods by using rigorous mathematical analysis: under what conditions does a particular algorithm work, and, perhaps even more essential, when and why does it fail to yield the desired results.

The class will cover the following topics: Iterative solution of nonlinear algebraic equations (and systems of such equations), direct and iterative methods for systems of linear algebraic equations, iterative methods for eigenvalue problems of matrices, linear approximation of functions (interpolation, least squares approximation, Chebyshev approximation, approximation by spline functions), numerical differentiation and integration, linear difference equations, finitedifference methods for ordinary differential equations (initial-value problems and boundary-value problems).

### Prerequisite: Math 200.

### 328 Applied Mathematics for Engineers II, lect.: 3 hrs.

### The following topics will be discussed.

### First term:

(a) Linear algebra: matrix theory, systems of linear

algebraic equations (theory and num methods for solution), eigenvalue problem matrices.

(b) Linear ordinary differential equations, re tion of higher-order equations to systems of order equations, applications.

(c) Numerical solution of ordinary different equations: one-step methods for a single a tion and for systems of first-order equation discussion of stability properties (abso stability, A-stability) of these methods, exam of multistep methods for first-order equations

### Second term:

(a) Fourier series and integrals, orthogonal is tions.

(b) Linear partial differential equations of , two; Model problems from mathematical ph (wave equation, heat equation, Laplace's Poisson's equations).

(c) Elementary probability and statistics.

Prerequisites: Math 228 or 200, or equival class.

No more than one credit will be given for h 300, 328, 350.

## 330 Linear and Integer Programming; lec hrs. (Half-course).

Linear programming, at its simplest, consists procedure for finding the optimal allocation scarce resources. It is perhaps the most wid used technique in Operations Research and Elements of graph theory, paths and cycles, business, government, and even to prov theorems in linear algebra.

In this class, the mathematical structure of the model will be studied and several solu methods developed. The duality theorem and uses will be emphasized. An economic interp tion of LP models will be presented using ad analysis concepts (or possibly game theory) efficiency of several solution methods wi compared by using computerized packages certain applied problems. Finally the cu plane method will be developed for the all-inter problem.

Prerequisite: Math 200 and 213 (or 204).

### 331 Discrete and Dynamic Program lect.: 3 hrs. (Half-course).

This class extends the variety of optimil models of Math 330. Initially the study of it LP problems is continued with the assign and transportation models. This leads in general network problems and to matching lems in graph theory. The basic theory of cu

# nathematics

rogramming and the method of Lagrange multiis presented. This is followed by an induction to models of dynamic and Markovian amming. Finally some special methods for scale problems are considered. In each applications will be presented. These incapital budgeting decisions, production heduling and multi-period planning models.

# prerequisite: Math 330.

132Applied Group Theory, lect.: 3 hrs., (Half-

this interdisciplinary half course is intended for mird year undergraduate and first year graduate students majoring in either Physics, Chemistry or wathematics. The topics covered will include: indamentals, normal subgroups, homomormisms, representations, character, orthogonaliv symmetry groups in crystallography, symmetry groups of the Hamiltonian operator and its presentation. Applications to quantum nechanics.

prerequisite: Math 213 (or 204).

this course can be combined with Math 302 or Math 311.

### 333 Graph Theory and Combinatorics, lect .: 3hrs. (Half-course).

been applied to a wide range of problems Eulerian graphs, trees, planar graphs and the Euler polyhedral formula, Hamiltonian graphs, promatic numbers, the five-colour theorems; tems to be selected from the following topics to suit class; graphs and matrices, graphs and groups, extremal problems, and enumeration roblems

Prerequisite: Consent of instructor.

334 Regression and Analysis of Variance, ect.: 3 hrs., (Half-course).

introduction to regression with emphasis on practical rather than the theoretical aspects. pics include fitting a straight line in matrix erms and fitting of general linear models, analysis of residuals, transformation of data, cor-Plation, multiple and polynomial regression, eighted least squares, indicator variables, selec-<sup>10</sup> the best regression equation. Also includes alysis of variance models and an introduction non-linear least squares.

s course will make extensive use of existing <sup>mputer</sup> packages.

<sup>reequisite</sup>: Math 206 or Math 106/107 with a

### grade of B or better and Math 100.

335 Applied Multivariate Analysis, lect.: 3 hrs., (Half-course).

The course deals with stochastic behavior 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, and categorized data; analysis of interdependence; structural simplification by transformation or modeling; and hypothesis construction and testing.

Prerequisite: Math 206 or Math 106/107 with a grade of B or better and Math 100.

## formerly Math 306.

This course is intended to engender an understanding of the basic concepts of probability, compatible with the student's mathematical background, and to illustrate the great variety of practical applications of probability to science and industry.

Topics covered will include: (a) fundamentals and axioms used in the construction of models: (b) the classical models: binomial and hypergeometric, the multinomial distribution, the Poisson and exponential, and the uniform distribution: (c) definitions of random variables, independence, functions of random variables, and distributions of sums of independent random variables: (d) conditional events and their probabilities; (e) the uses of conditional probabilities in modeling real processes; (f) laws of large numbers and the Central Limit Theorem.

Examples chosen to illustrate the applicability of probabilistic formulations will be taken from the natural and physical sciences.

Prerequisite: Calculus to at least the level of Mathematics 200. This may be taken concurrently.

## course), formerly Math 317.

This course will develop the concepts of (a) Markov Chaings and continuous time Markov processes, (b) vector independence and the multivariate normal distribution, (c) stationary time series,\* with an emphasis on practical applications. The

336 Probability, lect.: 3 hrs. (Half-course),

337 Stochastic Processes, lect.: 3 hrs. (Half-

ability to translate from a physical context into the language of a probability model will be stressed.

This course is a natural sequel to Math 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.

## Prerequisite: Mathematics 336.

## 338 Sample Survey Methods, lect.: 3 hrs., (Half-course).

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, mutlistage and multiphase sampling; nonsampling errors and non-respondents, etc.

Prerequisite: Math 206 or Math 106/107 with a grade of B or better and Math 100, or consent of instructor.

## 339 Non-parametric Methods, lect.: 3 hrs., (Half-course).

This course is intended to equip students with enough knowledge of non-parametric methods to be able to perform the statistical analysis themselves and to interpret results. Topics include basic tools, order statistics, goodness of fit tests, location problems on one and two samples including signed rank tests, Mann-Whitney, Wilcoxon procedures, Kruskal-Wallis test, inference on scale parameters, confidence interval procedures, tests of randomness and association analysis. Also includes comparison of more than two treatments including randomized complete blocks.

Prerequisite: Math 206 or Math 106/107 with B and Math 100.

## 350 Intermediate Analysis, lect.: 3 hrs.

Mathematics 350 continues the analysis sequence begun in Mathematics 250.

Topics included in the course: 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, coordinate transformations, Analytic functions, Cauchy-Riemann equations, Cauchy's theorem, Power series, Laurent series, residues.

Prerequisite: Math 250 and 213 or consent structor.

Credit will be given for only one of Math 300 . and 350.

## 401 Measure Theory and Integration, lect. hrs.

The fundamental position of the Lebesque tegral in modern mathematics makes this com a requirement for serious students of the sun Topics include measure, outer measure, inte tion, the classical function spaces, different tion, product measures, and the Riesz represent tion theorem.

## Prerequisite: Math 213, 350 (or 300).

## 402 Theory of Functions of a Compl Variable, lect.: 3 hrs.

Topics include: topology of the complex plane tegration, analytic functions. Cauchy's theorem elementary functions, maximum mod theorem, conformal mapping, power sen analytic continuation, Riemann surfaces, Laur series, theory of residues, meromorphic to tions, normal families, Riemann map theorem, harmonic functions.

## Prerequisite: Math 350 (or 300).

## 403 Advanced Abstract Algebra, lect.: 3 htt

This second course in abstract algebra deals the structure of groups, rings, fields and mod Topics which may be discussed include Sy theorems, tensor products, Ext and Tor, mod over a principal ideal domain and Galois Theor

### Prerequisite: Math 303.

## 405 Introduction to Algebraic Geome lect.: 3 hrs.

Introduction to the basic concepts of alge geometry, starting from the classical point of to the way in which algebraic geometry is don day. Many concrete examples will be stu Some topics are: irreducible algebraic sets Zariski topology, affine varieties, pre-vari dimension, spec, affine schemes, pre-scheme

## Prerequisite: Math 303.

## 406 Statistical Inference, lect.: 3 hrs.

Sampling statistics are generally used to a information concerning the known character of the population. Such general

# mathematics

trom sample to universe is statistical inference. when we reach a conclusion by inference from sample data, we do so at the risk of being in error. this risk can be calculated numerically. It is the purpose of this class to describe methods which lead to valid inferences and to calculate the risk of error in those inferences. Several tests of hypothesis will also be derived regarding these interences. Treatment will be of a mathematical nature. Students will be able to apply statistics competently in such fields as the social sciences, biological sciences and medical sciences. After this class, every branch of statistics will be open for further study.

the topics covered will include the following: noint estimation, consistent, sufficient, efficient and unbiased parameters, method of maximum likelihood, method of least square, method of moments, method of minimum X<sup>2</sup> minimum variance unbiased estimation, interval estimation. minimax and Baye's estimation. Nevman-Pearson's lemma, composite hypotheses, goodness of fit tests, likelihood ratio tests, critical region, locally most powerful tests, non-parametric tests.

Prerequisites: Math 200 and 310.

### 410 Decision Theory and Theory of Games. lect.: 3 hrs.

In the last few years, statistics have been formulated as the science of decision-making under uncertainty. Decision theory applies to statistical problems the principles that a statistical procedure should be evaluated by its consequences in various circumstances. This model for decision theory is a special case of game theory. A game is characterized by a set of rules having certain formal structure, and governing the behaviour of certain groups.

The central ideas and results of game theory and related decision-making models will be studied in this class: general decision problems, Bayes and minimax solution of decision problems, construction of Bayes decision rules, sequential decision estimation rules, empirical decision rules and testing as aspects of decision theory, rectangular games, games in extensive forms, games with infinitely many strategies, continuous games, separable and cooperative games, zero sum and non zero sum n person games.

Prerequisite: Consent of Instructor.

# 412 Ordinary Differential Equations, lect.: 3.

The course is intended to be of interest to physicists and biologists as well as mathematiclans. No previous course in differential equa-

theorems.

course).

course).

An introduction to the theory and applications of continuous linear operators on Hilbert spaces,

tions is necessary. The course will introduce the qualitative theory of ordinary differential equations and several applications. Included are existence and uniqueness theorems, systems of linear and non-linear equations, stability theory, perturbation theory, Poincare-Bendixson theorem & non-autononomous equations.

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Applications included are RLC circuits, the nbody problem and Hamiltonian mechanics, and mathematical ecology. The applications are designed to illustrate some of the qualitative information that may be derived about mathematical models from the theory developed. The latter part of the course will be devoted to reading several original papers the subjects of which will depend upon the interests of the students.

Prerequisite: Consent of the instructor.

413 Ring Theory, lect.: 2 hrs.

Structure of associative rings including Grothendieck's functional representation of commutative rings. Primary decomposition. Jacobson's theorems. Goldie's theorem. Artin-Wedderburn

Prerequisite: Math 303 and consent of instructor.

414 Introduction to Functional Analysis. lect.: 2 hrs. (Half-course).

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.

Prerequisites: Math 213 and 304.

415 Functional Analysis, lect.: 2 hrs. (Half-

Topological vector spaces, locally convex spaces, normability, function spaces, strict convexity, uniform convexity, reflexive spaces, support functionals, geometry of convex sets and other topics.

Prerequisite: Math 414.

416 Operator Theory, lect .: 2 hrs. (Half-

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; spectral theorem.

Prerequisites: Math 401 and 414.

## 417 Introduction to General Topology, lect .: 2 hrs. (Half-course).

Topological spaces, examples. Classification in terms of cardinality of bases, separation, etc. Product spaces, Tychonoff Theorem. Compactness, Compactifications, Tychonoff Spaces. Metrization.

## Prerequisite: Math 304.

## 418 Introduction to Algebraic Topology, lect.: 2 hrs. (Half-course).

Homotopy type and the Fundamental Group, geometry of simplicial complexes. Homology theory of complexes, chain complexes, homology groups for complexes, subdivision, induced homomorphisms, applications. Axioms for algebraic topology. Singular homology, the singular complex. Properties of cell complexes.

## Prerequisite: Math 417.

## 421 Introduction to Partial Differential Equations, lect.: 3 hrs.

In the first term, attention will be focused on the classical theory of partial differential equations. This will include the classification, study and solution (by the methods of eigenfunction expansions, Fourier and Laplace transforms, etc.) of partial differential equations of applied mathematics. The second term will involve the introduction and study of the concepts of modern numerical analysis as they apply to the solution of scientific and engineering problems involving partial differential equations. Examples of some specific applications to current problems will be examined.

## Prerequisite: Math 311.

## 430 Optimal Control Theory and Applications, lect.: 2 hrs. (Half-course).

This class retraces the historical path in the search for optimal solutions using methods from differential calculus. Initially the calculus of variations will be studied and the sufficiency conditions emphasized. A constructive solution of the Euler equations will be presented. Then the modern theory of optimal control will be

developed using techniques of mathematical programming. This approach will be applied to a variety of problems such as economic growth theory, inventory control and regulator problems Numerical methods will also be presented.

# Prerequisites: Math 300 and 331.

## 431 Nonlinear Programming, lect.: 2 hrs (Half-course).

This class presents 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 course is a basic prerequisite for understanding and contributing to recent developments in mathematical programming.

## Prerequisite: Math 300.

## 462 Data Analysis and Design of Ex. periments, lect.: 3 hrs.

Many aspects of the application of statistics to research problems do not arise naturally out of technique-oriented courses in statistics. This course is a problem-oriented approach to statistical design of experiments and data analysis. The problems discussed will be based on consulting experiences of the members of the Statistical Consulting Service of the Mathematics Department, although an attempt will be made to expose the general principles that underlie each specific case.

Students will be encouraged to develop novel ap proaches to solve the design and analysis prob lems of the case studies. It is expected that the students will work intensively on the problems that interest them most. This work may be o case studies, themselves, or it may be a mathin matical development motivated by the case studies. Students will be required to make forma presentations of their work during regular class hours.

Prerequisites: Statistical techniques which main be useful as background for this course would i clude any techniques covered in Math 206, 334 335, 336, 337, 338 or 339 although it is no necessary to have taken all of these as prequisites. Admission to the course is by consente the instructor.

# mediaeval studies

# 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 nistory, 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 storing 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

he Honours degree in Mediaeval Studies must have a major field consisting of 9 classes. selected from those with Mediaeval Studies umbers, which will include at least one in each a literature, history, philosophy and Latin. ther classes will depend on the individual stucent's interests, but all four disciplines must be epresented. The minor field may be varied to suit e taste of the student: he may wish to continue later periods in his favourite discipline or he y wish to acquire another language to help him his work. No class in the minor field may be m the Mediaeval Studies group. The four asses not in the major field may be widely scated: one or more of them may be 100-level preresites which may be necessary for later diaeval work, e.g., introductory German or in or Political Science.

ed are:

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 210, and 314. 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.

(English 202)

4000)

4300 A/B)

Literature 214)

199/5)

### Some sample programmes which might be follow-

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. 210), German for Beginners (German 100), and Intermediate German (German 200).

### 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. The numbering of the classes reflects subject and department, rather than order of difficulty or of priority.

201 History of the English Language

202 Old English (English 253)

203 Medieval Literature (English 218)

204 Middle English (English 351)

210 Introduction to French Mediaeval Literature (French 3300A)

211 History of the French Language (French

212 French Mediaeval Literature (French

214 Arthurian Romances (Comparative

301 Mediaeval Life and Thought (History

302 Mediaeval Europe (History 200)

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## 303 Mediaeval Civilization (History 300)

304 Roman History: The Cultural History of the Roman World (Classics 223)

306 The Mediaeval Church (History 302)

311 Paleography (History 400)

401 Mediaeval Philosophy (Classics/ Philosophy 338)

402 Latin Philosophical Texts (Latin 204)

403 Seminar on the Philosophy of the **Church Fathers (Classics 440)** 

414 Political Philosophy from the Stoics to the End of the Fifteenth Century (Poli. Science 2405, not offered 1977-78.

### microbiology

### Microbiology

### Professors

K.R. Rozee, Head K.B. Easterbrook C.E. van Rooyen

**Associate Professors** J.A. Embil L.S. Kind

S.H.S. Lee

**Assistant Professors** G.C. Johnston D.E. Mahony R.S. Martin E.S. McFarlane D.B. Stoltz C. Stuttard

The program in Microbiology is designed to pro vide the student with an understanding microorganisms - their structure, their function their diversity, and their contribution to the biosphere. The field of Microbiology considers the activity of such diverse organisms as bacteria viruses, fungi and algae and the program offered by the Department attempts to give a basic train ing which may serve as preparation for graduate or professional work in microbiology related to Medicine, Dentistry, the Health Professions, the Food Industry, Agriculture and Environmental Management.

The Department of Microbiology is located in the Sir Charles Tupper Medical Building and offers microbiology programs in the Faculties of Medicine, Health Professions, Arts and Science and Graduate Studies. Its members take part in teaching in all faculties and the research done b the faculty members is relevant to both general and special fields of Microbiology.

### **Degree Programmes**

The Department, in conjunction with the Biolog Department, offers both a coordinated 2-year pro gramme and a combined honours programme Microbiology. These programmes are designed for students entering their second year of stud and lead, respectively, to the general B.Sc. and the honours B.Sc. degree. Combine Biology/Microbiology honours students doin thesis work in the Microbiology Department ma participate in a weekly Microbiology Department seminar program (Mondays, 1-2 p.m.) in lieu of th Biology Department Honours Seminar series Students intending to study Microbiology as major subject are urged to consult the depa ments concerned at their earliest opportunit faculty advisors are: D.B. Stoltz (Microbiolog Dept.) and R.G. Brown (Biology Dept.).

# microbiology

As a general rule, students will have previously aken a comprehensive course in general inroductory biology (either Biology 1000 or 2000), nior to embarking upon any programme in Micronology. It should be noted in the class offerings sted below that Microbiology 2100 A/B is a prerequisite for all courses given in this Departent except Microbiology 302.

, number of courses offered by the Biology nepartment have been approved as part of the pint Biology/Microbiology undergraduate prorammes in Microbiology. These are:

Riology 3111B, Bacteria in Nature Riology 3113A, Bacterial Physiology Biology 3116R, Mycology Biology 4066B, Microbial Ecology

course descriptions for these will be found in the Riology Dept. listings in the calendar.

### Classes Offered

Microbiology 2100 A/B: Introductory Microbiology, 2 hour lecture; 3 hour lab.; D.B. stoltz (course coordinator), R.G. Brown, G.C. Johnston, R.P. McBride

This class introduces the basic concepts of Microbiology through lectures, laboratory sessions, demonstrations and films. Subjects to be covered 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. The course is a prerequisite for all the other Microbiology courses listed below, with the exception of Microbiology 302. Students considering Microbiology as a major area of study are encouraged to take 2100A followed by Biology 3111B in the same academic year.

Microbiology 302: General Microbiology, 2 hour lecture; 3 hour lab.; S.H.S. Lee.

This class is intended to provide a general knowledge of microbiology at an introductory evel for students in Pharmacy and in other disciplines. The lecture topics to be discussed are broadly divided into three sections. The first of these introduces the microbial world, the basic concepts and facts of structure and function, growth, genetics, and immunology. The second omprises a systematic survey of the medically mportant groups of microorganisms, with special mphasis on host-parasite relationships. The hird 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 ex-Perience in the isolation, identification, cultiva-

ed.

Microbiology 3114A: Introduction to Virology, 2 hour lecture; 3 hour lab.; E.S. McFarlane,

Prerequisite: Microbiology 2100 or 302.

Microbiology 3115A: Introduction to Immunology, 2 hour lecture; 3 hour lab.; L.S. Kind.

This course will deal with 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.

Mahony.

This course consists of a broad survey of the major bacterial groups. 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.

## tion and control of microorganisms.

Microbiology 3112A: Microbial Ultrastructure, 2 hour lecture; 3 hour lab.; K.B. Easterbrook, D.B. Stoltz.

This course covers the ultrastructural features of microbes. Principles and practical aspects of techniques for analysing periodic structure, and ultrastructure in general, are considered in the first part of the course; particular emphasis will be given to electron microscopy. In the second part the ultrastructure of macromolecules and their organization into more complex structure in viruses, bacteria, yeasts and protozoa is discuss-

Students are expected to have already an understanding of structure at the light microscope level and hopefully will not have an aversion to elementary physics.

Prerequisite: Microbiology 2100 or 302. Note: this course may not be given in its present format in 1977; please consult Dept.

This course is designed to provide an introduction to Virology, and will to some extent discuss all kinds of viruses - animal, bacterial, insect and plant. Important concepts relating to the isolation, biophysical characterization, classification and replication of viruses will be considered.

Prerequisite: Microbiology 2100 or 302.

Microbiology 3118B: Systematic Bacteriology, 2 hour lecture; 3 hour lab.; D.E.

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Prerequisite: Microbiology 2100 or 302.

Microbiology 4022B: Microbial Ultrastructure Project, 5 hour lab.; K.B. Easterbrook; D.B. Stoltz.

A research project using one or more of the skills acquired in Microbiology 3112A, selected by the student in consultation with the instructor.

Prerequisites: Microbiology 2100 and 3112A.

Microbiology 4033R: Microbial Genetics, 2 hour lecture; 3 hour lab.; C. Stuttard, G.C. Johnston.

This course is concerned with the study of heredity in microorganisms - especially bacteria and their viruses. Although there will be some discussion of the chemical basis of mutation, DNA replication, recombination and repair, the main emphasis will be placed on mechanisms of gene transfer in microbes, gene mapping and the use of microbes as model systems for the study of general genetic phenomena. The latter part of the course will consist of student-led seminars on topics raised during lectures, such as: drugresistance transfer (R) and other plasmids; restriction endonucleases, and the isolation and cloning of genes; genetic control systems.

Prerequisites: Microbiology 2100 and Biology 2030.

Microbiology 4414B: Virology, 2 hour lecture; 3 hour lab.; E.S. McFarlane.

A class for advanced students in Virology. Several aspects of Virology will be discussed in detail: virus structure; virus replication, viruses and cancer, viral genetics, virus-cell interaction, etc.

Prerequisite: Microbiology 3114A

# Microbiology 4115B: Immunology, 2 hour lecture; L.S. Kind.

Students will read and be prepared to discuss articles from the current Immunological literature. While all major areas of immunology will be included, the emphasis will be on topics previously studied in 3115A.

Prerequisite: Microbiology 3115A.

Microbiology 4900: Honours Research and Thesis.

# music

# Music

# **Teaching Staff**

Ray Byham — Piano and Músic History Kaye Dimock — Music Education Philippe Djokic - Violin Kenneth Elloway - Band Instruments Dennis Farrell — History and Composition Clifford Ford — Theory and Composition Elvira Gonnella - Voice Gary Karr - Double Bass Harmon Lewis — Harpsichord and Organ Ann Manicom — Music Education Jeff Morris - Voice Jeff Stern - Trumpet Lynn Stodola — Piano Steve Tittle — Theory and Composition William Tritt - Piano William Valleau - Cello Carol Van Feggelen — Guitar and Lute David Wilson - History

Halifax is the home of the Atlantic Symphony of chestra as well as being one of the centres musical activity in Canada. It is therefore possin to supplement the full time teaching staff with m perienced instructors covering every orchestra instrument. The Music Department's we equipped offices, lecture studios, teaching studios, rehearsal and practice rooms a situated in the Dalhousie Arts Centre. Included this Centre is the Rebecca Cohn Auditorium, h major concert hall in the Atlantic Provinces, a there are regular orchestral concerts by the Alla tic Symphony, performances by international famous artists sponsored by Dalhousie Univer ty, and many other chamber, contempora choral and operatic performances. Regular Si day afternoon concerts are free to the public a students may buy tickets for most other concer at reduced prices.

# Objectives

There is a great difference between loving m and electing to embark upon full time mus training: the difference between a profitable re ation open to all and a singular concentration specialized skills, open only to those with ta and specific pre-university training. resources of the Music Department are ge towards providing a thorough musical training those wishing to specialize in music, but they equally available to the many non-specia students who wish to increase their mus awareness and involvement.

In the specialist field, the Department offers ing as teachers or performers or both. Pract and general musicianship are prerequisite both the performer and the teacher. Schools a need of performing musicians to pass on skills to the young, and performing music

# music

have a need to understand the practice of educational institutions, which are shaping the attitudes of their future audiences. The Department's concentrated courses are aimed at musicians of high performing ability who, as a result of that ability, feel an inner compulsion to follow a career which involves specialized practical music making of one sort or another.

If teachers or performers are to excite others with music, they must themselves have been constantw excited by music. This excitement is usually horn out of an increasing insight and ability for solo and ensemble performance and by a continuing discovery of music, new and old. It must be the first obligation of a University Music Department to incite ever improving performance standards and a curiosity and wonder about music through ensemble playing, creativity, informed inmuiry into musical trends, and styles and a critical awareness of the living musical scene.

# The Nature of Concentrated Music Study

western music has developed into a most complex language. Music is conceived aurally and written down in notation in order to be translated into sound. Before musical notation can be translated into sound, three demanding skills are required: a thorough knowledge of musical theory, the ability to hear complex scores aurally and the practical facility needed for performing. No profitable study of music in depth can be undertaken until these skills have been acquired. If these basic skills are to be acquired in the first two years, so that study in depth, greater practical facility and the teaching and education studies can be programmed for the remaining two years, time will not allow for any prolonged study of other subjects. However, in pursuing the degree courses outlined, music students will inevitably be brought into contact with many other relevant fields of study.

# Admission to Music Major Courses

Students who wish to enroll in a degree programme in the Department of Music must satisfy the requirements for admission to the Faculty of Arts and Science and must satisfy additional requirements in the Department of Music. Candidates will be required to deomonstrate proficiency as instrumental or vocal performers, and in he basic rudiments and theory of music.

Inder the discretionary powers of the Admisons Office, students who do not meet the normal requirements of the Faculty of Arts & Science y be considered for admission if they can <sup>nemonstrate</sup> sufficient skill as instrumentalists.

then making application for admission to the versity, music applicants should request the oplementary application form for the Departent of Music.

the ena of April.

# Degree Programmes

The B. Mus. Ed. is a four year course which covers a Nova Scotia Teacher's Certificate (Class 5), provides continuous instrumental or vocal instruction with ensemble opportunities, basic theoretical and aural skills, opportunity to study and research into a variety of musical styles and periods and the teaching observation, skills and practice required for teacher's certification. Students are required to take five full credit classes in each of the four years. In their first year, students will normally be required to take classes 100, 101, 120 and 130 plus one arts elective. In their second year, students will normally. be required to take classes 200, 201, 220, 230 and an Education Foundation class in the Education Department. In their third and fourth years students must include classes 350, 360, 450A or 451A, 450B, 460C, and at least one Music Education C project class. Other classes may be chosen from those listed. Classes in keyboard playing are available for non-pianists during the first two years and no students will be admitted to the third year until they have passed a formal test of ability to accompany and chord at sight a simple folk tune and to play their own theoretical exercise at the keyboard.

The B.A. (Honours) is a specialist four year course with a major concentration in music. Students meeting the department's qualifications for immediate entry into this course may take four classes out of five in music in their first year and twelve classes out of fifteen in their second, third and fourth years. The requirements of the first two years are as for the B. Mus. Ed., with the exception of the Education Foundation class. Keyboard requirements are also the same as for the B. Mus. Ed.

In their third and fourth years students may choose to concentrate in performance, music history or composition.

Requirements for concentration in Performance

Third Year 300R Applied Skills 301R Applied Skills Arts Elective

Fourth Year 400R Applied Skills 401R Applied Skills Arts Elective

Applicants are advised to send in their forms by

One historical period One whole credit in Projects

One historical period One whole credit in Projects

# 144 music

Class 346R (Music in Contemporary Canada) or Class 333R (The Contemporary Scene) must be included somewhere in this programme.

Requirements for concentration in Music History

## Third Year

300R Applied Skills

333R The Contemporary Scene One other historical period One whole credit in Projects Arts Elective

## Fourth Year

One historical period One whole credit in Projects Arts Elective The remaining two credits may be taken from Projects and Historical periods. They may also include 400R (Applied Skills) and/or one additional Arts Elective.

# Requirements for concentration in Composition

Third Year 300R Applied Skills 310R Composition 333R The Contemporary Scene One historical period or whole credit in Projects Arts Elective

# Fourth Year 410R Composition

## 411R Composition

The remaining two credits may be taken from Projects and Historical periods. They may also include 400R (Applied Skills).

Mark requirements are the same as for those of any other B.A. (Honours) in the Faculty of Arts and Science. All students in the programme must give evidence of substantial achievement. This will be a Graduation Recital for concentration in performance, a paper on a chosen period or subject for concentration in Music History and a portfolio of compositions for concentration in Composition.

Approval is currently being sought to operate this programme as a B. Mus.

The B.A. (General) is a three year course involving less specialization than the B.A. Hons. Students must include the general musicianship classes in their course of study. Other classes are arranged to suit the students' individual needs and interests.

Class 101: Survey of Music Literature counts as a formal class in which written work is considered frequently and in detail.

Students with a B.A. from another institution may apply to take a one year course providing Teachers Certificate 5 in the Province of Nova Scotia.

# B.A., B.Ed.; Major in Music

This is a four year integrated course run cooperatively between the Music and Education Departments. Students do not normally decide to enter this until their third year. Details are available from the Music Department.

# **Classes for Non Majors**

A number of classes are offered as arts electives for non-majors. These are listed at the end.

# **Classes offered for Music Majors** A. Practical Musicianship 100, 200, 300, 400, 301 401. Applied Skills

Offered in: violin, viola, cello, bass, flute, oboe clarinet, bassoon, horn, trumpet, trombone and tuba, percussion, piano, organ, harpsichord voice, and guitar and lute.

In general, all students will receive at least one hour per week individual instruction from an ex perienced professional performer of their major instrument. In addition, at the discretion of the Department, students may receive up to one hour Abasic class designed to increase the clarity and per week of instruction on a second instrumentor in composition groups. The programming of lessons will be flexible so that, where appropriate students may spend up to three hours a week in a ques employed will be group improvisation and group instruction situation. The various levels of applied study indicate the year of study in the Department and are not intended as an assess 201 Survey of Instruments and Instrumentament of standard. Students automatically more tion up a level each year unless, exceptionally, they are advised to repeat the whole year. Term gradings are based on progress as well as on a tual performing standard. At the discretion of the Department, students may opt for Composition a a second applied skill in their third or fourth years Students with sufficient talent and achievement may be permitted to take two full credit classes on their major applied instrument in their third or 20 Theory and Analysis fourth year.

Students will be encouraged to do as much ensemble playing as possible and chamber and written skills. groups will be scheduled according to the range of abilities and specialities within the Depart ment. Students will also be encouraged to per form in recitals.

Regular ensembles include the Band, Chorale and Chamber Singers. Many other chamber ground are scheduled according to needs and cumstances.

# 310, 410 Composition

cular works from any period of history will be to serve as a springboard for original stition by the students. Student's work will aposition of the second of the sessions with the instructor. Students encouraged to include in their work comins for performance by students and comns in a contemporary style that are relevant ne school classroom situation.

# R General Musicianship: 1st and 2nd Years

# at Survey of Music Literature

in introduction to the styles and forms of An music, including contemporary music with some reference to non-western musics.

# 120 Theory

the study of musical styles will be used as a key a pasic understanding of the techniques of melody, harmony and formal structure in Western MUSIC.

# 130 Aural Perception

sensitivity of aural responses to music. The aim is indevelop aural awareness of pitch, rhythm, harmony, sonority and texture. Among the technicomposition in the experimental music studio.

Asurvey of the evolution and history of the main istrument families in relation to the music they were expected to play and to styles of orchestra

rerequisites: 101 or permission of the instructor.

ore advanced study of musical techniques actorms including further development of aural

requisites: Music 120 and 130 or permission of siluctor.

# Music History

advanced history class covering stylistic <sup>ads</sup> from the Middle Ages to the present day.

<sup>quisites</sup>: Music 120 and 130 or permission of

**Project Classes** The purpose of the projects classes is to enable groups of students to study in some depth particular aspects of music of their own choosing and, where possible to apply their practical skills to each study. The role of the instructor responsible for each project will be to guide the students towards appropriate source material, records and books and to correlate the activities, researches, and practical presentations of the students. The following topics are currently offered:

340B The organ and its literature 341A Early Keyboard instruments and their music 342B **Piano** literature 343R Opera history 344A&B Opera workshop 345A Chamber music 346R Music in Contemporary Canada 349R Band instruments and techniques (for description of this class, see Music Education classes).

# **Historical Period Classes**

330R	Mediaeval
	(includes p
	struments).
331R	Baroque Mu
332R	'The Sympho
333R	The Cont
	description,
	non majors).

# **C. Music Education Classes**

# **349 Band Instruments and Techniques**

Work will include a practical introduction to the flute, clarinet, saxophone, horn, trumpet, trombone, tuba and percussion; elementary scoring for band, basic conducting routines, rehearsal methods, study of band literature, care and maintenance of instruments, purchase of instruments and the historical background of the Wind Band.

# 350 Classroom Teaching Methods

Explanation of different methods of teaching music in class with emphasis on the Elementary School. Work will include creativity, Orff and Kodaly methods, song material and presentation and the integration of music with other subject areas.

360 Classroom Field Experience

The purpose of these classes is to enable students to choose particular periods for in-depth study. The periods are divided as follows:

> al and Renaissance music s performance on early inits).

Music

phonic Tradition

ontemporary Scene (for ion, see courses available to

# 146 music

Practical application in Elementary Schools of skills explored in class 350, including observation.

# **450A Secondary Teaching Methods**

Explanation of different methods of teaching the various facets of music in the Secondary School.

# 451A Band Teaching Methods

Explanation of specific methods of teaching band instruments and rehearsing bands in schools.

# **450B Field Projects**

Students will choose their teaching area and, under supervision, be "articled" to a suitable teacher in the area.

# 460C Classroom Field Experience

Four weeks of supervised classroom teaching practice prior to and at the end of the academic year.

# **Music Education Project Classes**

455C Teaching music appreciaton 456C Contemporary music in the classroom 457C Choral literature and choral conducting

# D. Classes Available to Non-Majors

# **135 Introduction to Music**

This is the usual first year class for nonspecialists. Exposure to and consideration of all forms of music: classical, contemporary, rock, jazz, electronics, etc.; attendance at recitals and workshops; lectures and demonstrations by Faculty and visiting artists. No prerequisite.

# 207 Guitar and Lute

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 history of fretted instruments.

Prerequisites: Personal interview with instructor.

# **226** Experimental Music

Group improvisation and composition in a contemporary medium using the percussion and electronic resources of the sound studio. Students will explore basic musical structures and learn the use of synthesizers, special recording techniques and tape mixing and editing. Detailed knowledge of music will be of less use in this course than imagination and an interest in temporary culture and in electronics.

Prerequisites: Personal interview with instrum

# 235A&B History of Musical Styles

An in-depth study of composers and their . in relation to their lives and cultural backgroup The class content will relate to music being formed in Halifax. Essentially for students have already taken a 100 level class in mus who can demonstrate a correspondingly background of listening and musical knowled

Prerequisites: Music 135 or permission of inst tor.

# 333 The Contemporary Scene

This course will attempt to foster an understa ing of the main trends in 20th century "ser music, with particular emphasis on the musical practices of the past twenty-five year so. As one of the primary aims will be to deve perspective regarding the various syntheses cross-cultural influences in contemporary m the course will include some consideration dis inaddition, one undergraduate class is offered. history and present status of rock and jazz, the fluence of "non-western" musics, etc. Inclus 185R Introduction to Oceanography, lect.: 3 will be opportunities for performance, computers, R.O. Fournier. tion, individual experimentation, and group tivities involving improvisation, tape and a this class surveys the field of Oceanography in tronic techniques, etc.

tor.

# E. Ensembles

The Dalhousie Chorale meets on Monday eff ings and performs four concerts a year with chestra.

The Dalhousie Wind Ensemble meets on The

Students interested in joining either of should contact the Music Department.

# oceanography

# Oceanography

nceanography is an inter-disciplinary science cludes studies of tides and currents, the ustry of sea water, plants and animals that the sea, and ocean bottom sediments and lying crustal structures. Career oceanoare employed in Canada in a few univerin various federal laboratories that are ed in both basic research and applied probas which meet a national need, such as fisherinvestigations, exploration for offshore ral resources, and studies of ice in navigable valers, and in a number of private companies inarested in marine environmental protection or ex-

A good background in basic science is a recessary prerequisite to entering the department. Properly prepared undergraduates are perinted to take one or more graduate classes as electives. There are graduate introductory classes mich survey the entire field and advanced classes in each of the major specialties envsical, chemical, geological and biological meanography and fisheries biology.

eneral and shows how the oceans, which acount for more than 70c of the earth's surface. Prerequisites: Personal interview with the insta function as a dominant environmental force. Consteration also will be given to man's impact on hisecological system.

his class is designed to give the student a tackground or feeling for the ocean, what meanography is, and what oceanographers do. It s not a good "background to science" course. nce little feeling will be obtained for scientific echniques which would otherwise be acquired in day evenings and performs two concerts a year alaboratory class. Most of the material which will covered will be descriptive rather than basic, asmuch as it is impossible in the time allowed the material covered to also teach the basic lired sciences.

> equisite: Restricted to second year, or more inced students.

# philosophy

# Philosophy

# Professors

A.H. Armstrong D. Braybrooke F.H. Page R.P. Puccetti

**Associate Professors** R.M. Campbell W.F. Hare I.A. MacLennan R.M. Martin (Chairman)

# **Assistant Professors** S.A.M. Burns

P.K. Schotch S. Sherwin T. Tomkow

Philosophy can best be described by listing some of the questions philosophers try to answer: Are people in any sense free, or are they conditioned and determined by their environment, heredity, etc.? Have people souls (which may survive death), or are they made completely of matter which obeys the laws of physics? Are there general ethical truths which can be rationally discovered or is it only a matter of individual feelings? What do we mean when we talk about justice, or when we demand equal treatment for women? Related to these questions are general ones concerning the meaning and purpose of life. Then there are questions about the nature of knowledge: Are there truths which can be proven without reliance on sense-experience? What are the aims of the sciences, and how do they work? Does religion provide us with knowledge, perhaps of a different sort? How can we deal systematically with the difference between good and bad reasoning?

These provide only a small sample of philosophical questions. Since philosophers themselves disagree on the answers to philosophical questions, students will not be expected to accept any position as dogmatic truth. The emphasis is on comparing and evaluating many different answers; philosophy students are judged not on the basis of what they believe, but rather on the basis of their mastery of the various answers philosophers have given to such questions, and of the clarity, precision of expression. imaginativeness, relevance, and coherence of their arguments for their positions.

Philosophy classes in general are not formal lectures, but provide a forum for presentation and discussion of various positions. As a result, students acquire training and discipline in philosophical technique - rational judgement and argument - which will be of benefit whatever subject they specialize in. To cite one example:

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the training in logical argumentation provided by philosophy is recognized by law schools as an excellent preparation for the study of law.

# The Arrangement of the Classes

Students who are interested in taking a beginning class in philosophy may take Philosophy 100 or any class numbered in the 200's. These classes have no prerequisites and are open to first year students, and to students of any other year, with or without background in philosophy. This makes it possible for students in any year to begin work in philosophy in a variety of different ways, suited to their interests. Many students take Philosophy 100 as their first philosophy class; this is a general introduction to philosophy, and treats a variety of topics. Many others, however, including those in their first year of university, find the more particular subject matter treated in some 200-level class more to their interest, and take that as their first class. Students interested in philosophy should carefully read over the descriptions of Philosophy 100 and all the offerings in the 200's. Students intending eventually to take classes numbered in the 300's should note, however, that these classes usually require as prerequisite one or more of Philosophy 100, 200, 201, and 202. The 400-level classes are normally open only to advanced students in philosophy.

# Degree Programmes General B.A. in Philosophy

Students are strongly urged to take at least one of Philosophy 200, 201, 202, 305, and at least one of Philosophy 230, 235, 310, 319, 320, 346. All students proposing to take a General degree in philosophy should arrange their course in consultation with the undergraduate advisor in the department.

# **B.A. With Honours in Philosophy**

Students intending to specialize in Philosophy should take the honours course. It is the normal preparation for graduate study in philosophy. The honours course generally consists of ten classes in philosophy, two clases in a minor subject approved by the Department and four elective classes in at least two subjects other than philosophy. The ten philosophy classes in an honours course must include: Philosophy 200 (or 201 or 202), 230, 305, 310, 320 and one 400-level class. Philosophy 100 may be included in the ten classes of the honours course, if it was taken at the beginning of the course. In addition, students taking honours in philosophy must satisfy the regulations for the first year of study for the General B.A. and also the overall requirements for the General B.A. Students intending to take honours in philosophy should arrange their course in consultation with the undergraduate advisor in the department.

## **Combined Honours**

There are several combined honours progra mes:

Philosophy and Economics Philosophy and English Philosophy and Psychology Philosophy and Sociology or other combinations that can be arranged

Students interested in taking any of these conbined honours programmes should consult the undergraduate advisor in the department

# 100 An Introduction to Philosophy meetings weekly, Staff.

There are several sections of Philosophy 100 and all of them provide a general introduction several areas of philosophical concern. There are however, two distinct types of Philosophy in classes, each with its own approach. The tu types are described below:

# Great Philosophical Writers and their Systems

these sections, readings will be taken from a la of the works of some of the greatest philosopher in history; the emphasis here will be on the take reaching systems created by each of these philosophers for treating several different philosophical questions. This approach will be taken in all even-numbered sections.

stead of studying the work of each of a few great arguments as they are found in philosophy, philosophers in depth, students will read a science, law, ethics, or any other subject in which number of short articles from a much greate there is an appeal to reason. In order to develop a variety of sources; five or six short articles will be tacility in the employment of symbolism to apread giving a variety of different views on each a proximate the meaning and determine the logical several philosophical questions of current in consequences of statements in natural language. terest. This approach will be taken in all out students complete a minimum of forty ungraded numbered sections.

who prefer one approach to the other should try to the schedule one of the appropriate sections; if you cannot fit any of the preferred sections into your everyday life. In the course of the year, the conschedule, or if you feel no preference, be assured that any section of Philosophy 100 will provide in the discussion of topics common to metagood and thorough introduction to philosophi shysics and the foundations of logic: existence and philosophical technique. All sections we and the existential quantifier; Russell's theory of make provisions for a good deal of discussion small class groups. Only students who value #\*\* chance of discussion in a small class grout highly enough to commit themselves to com tinuous attendance should enrol in Philosophil 100.

# 200 Symbolic Logic, lect.: 3 hrs.; MacLennan.

Whenever we draw conclusions from premises such fields as mathematics, physics, engineer or economics (not to mention the other sciences

# hilosophy

we are using a simple deductive system, which it aim of this course to develop. By taking a e in logic the student should have a better rstanding of how we may derive the correct usions from our scientific hypotheses. One conclusion of understanding the nature of inference create a simple, artifical language, in which derivation of one formula from another is analogous to playing a game with pencil and analys The aim of Philosophy 200 is to create this anguage, and to discover its most useful proper-Although symbolic logic in this course will be sufficiently related to arguments in a natural anguage, the emphasis will be on the systems memselves. Because many students find this und of study to be quite new in their academic rareer, great care will be taken in presenting the material, and in addition there will be five assignments, which, when done, should lead to a uller understanding of the subject. No previous acquaintance with symbolic logic is presupposer Text: MacLennan, I.A., Symbolic Logic.

# miFormal Logic and Logical Argument, lect. with discussion: 4 hrs., R.M. Campbell.

this class develops the formal techniques and logical systems that are studied in Philosophy mo but with different aims. The objective of the class is to enable students to formulate and Current Philosophical Controversies: Here, in assess arguments expressed in natural language, but required exercises which are individually evaluated and carefully discussed in class. Ideal-Students who want to take Philosophy 100 and I the facility acquired should help the student to recognize "automatically" the logical structure of reasoning encountered in other disciplines and in cepts of predicate logic (with identity) are applied rescriptions and free logic; intensional contexts Leibniz's law; the true-false dichotomy and aski's semantic conception of truth; Gödel's inmpleteness result; counter-factual condi-<sup>ionals</sup> and possible worlds.

> grade in this class is based on four examinais at six week intervals during the year, or on optinal final examination, if the latter resents the best effort. Texts for this course Lambert and van Fraassen, Derivation and Interexample, and Howard Pospesel, uments. Although this class pursues a ough examination of elementary symbolic no previous acquaintance with symbolic

# sion: 3 hrs.; P.K. Schotch.

This is a class in applied practical logic. Symbolic logic techniques will be avoided as far as possible; instead, attention will be paid to the forms of reasoning as exemplified in good or bad real arguments, definitions, explanations, etc. The aim is the development of techniques to produce clear and valid reasoning; and to distinguish this from its opposite.

Each of us is involved, every day, in the process of making decisions; often many different courses of action are open to us and we must select one of these. What can be said in general terms about this kind of choice? Are there ways of making choices among courses of action the outcomes of which are uncertain? Can uncertainty be measured? These questions have puzzled those who have taken the trouble to think about them. for centuries. Concern about such matters can arise in such diverse areas as gambling, administrative planning and moral philosophy. In Philosophy 203, various ways of answering such questions are considered, along with the consequences of giving such answers.

This course will survey the philosophical and logical issues connected with elementary probability theory (the theory of uncertain events), utility theory (the formal theory of value) and the theory of statistical inference. Topics to be covered include: inductive inference and the logic of confirmation, the difference between relative frequency, and degree of belief interpretations of the concept of probability in theoretical and practical terms, the statistical concept of independence of events, utility functions and maximization principles. In addition, certain topics in the elementary theory of games of strategy will be treated in the light of current discussions of the concept of rationality.

There are no prerequisites either mathematical or philosophical for this course and all technical concepts required will be developed in the lectures. Students will be expected to develop facility with elementary probability calculations through the medium of problem solving both outside of class and during the tutorial session.

# discussion: 2 hrs.; P.K. Schotch.

An introduction to the problems and tools of analytic philosophy. After an introduction to

## logic or philosophy is presupposed.

202 Basic Principles of Reasoning, discus

203 Chance and Choice, lect.: 2 hrs., and tutorial: 1 hr./wk.; P.K. Schotch.

212 Philosophical Analysis, lect. with

characteristic methods of assessing and constructing philosophical arguments, the class will turn to an introductory examination of alternative analytical treatments of the following outstanding issues in metaphysics, the theory of knowledge, and ethics: skepticism about the possibility of knowledge beyond what we are immediately acquainted with through our senses; the apparent incompatibility of our beliefs in determinism and free will; the relation between the mind and the body; the meaning and justification of our ethical claims.

The grade in the class will be based on an examination at the end of each quarter of the year. The text for this class will be Philosophical Problems and Arguments, by Cornman and Lehrer.

# 216 Philosophical Issues of Feminism, lect. with discussion: 2 hrs.; S. Sherwin.

This course will be concerned with examining and evaluating the arguments for and against feminism within the major traditions of social and politcal philosophy, especially liberalism and socialsim. We shall try to understand such central concepts as justice, equality, happiness, freedom, rights and power, both in order to understand feminist arguments and also in order to see what light feminist insights shed upon traditional philosophical analyses of these concepts.

The course will also explore some of the practical questions raised by feminists, such as whether the ideals of feminism can be met by reform or only by revolution, and whether or not preferential treatment of members of oppressed groups, technically a form of discrimination, is actually just.

# 217 Existentialism, lect .: 2 hrs.; I.A. MacLennan.

The aim of this class is to study the works of four major philosophers in the existentialist tradition. The first term and part of the second will be devoted to the works of Kierkegaard and Nietzsche. The remaining time will then be devoted more or less equally to the works of Sartre and Heidegger.

218 Philosophy of Education, lect.: 2 hrs.; W.F. Hare. (Same as Educ. 4201A and B.)

(a) In the first term an attempt is made to analyse some of the crucial concepts in educational theory. What is teaching, and is it distinct from training, conditioning and indoctrination? Certain slogans in educational theory, e.g., "We teach children not subjects", and, "There's no teaching without learning" are carefully examined. How is

education distinct from teaching, and is it n ble to identify criteria which a process satisfy if it is to be considered education? Is any conceptual connection between the ide teaching and that of authority? These are kinds of issues discussed though the spadirection depends a good deal on the class

(b) In the second term, the class focuses philosophical issues concerning curriculum example: Is it meaningful/useful to base a riculum in schools on needs and/or interact What is involved in the claim that a curricul should be relevant? Are there any education arguments in favor of a broad curriculum? are we to assess curriculum goals such creativity, mental health? An attempt is made demonstrate the importance of analysis of fundamental concepts involved in such issues

# 220 Philosophy of Religion, lect.: 2 hrs.: P Page.

An introduction to the philosophy of relig Since there are many religions, is it possible identify anything that is essentially religion What sort of evidence would provide an reasons for the belief in a divine being? Is them cept of God a coherent one? Is the notion divine activity, for example in creation a 25 Greek Philosophy from Thales to Arisknowledge of a divine being? Do revelations a guns. religious experiences reveal more than the mer state of the experiencer? Are faith and rea alternatives or correlatives? Is the existence evil and suffering compatible with the existent of a God who is both omnipotent and mot perfect? Does rationality demand that tradition views of the divine be modified, or abandon What religious alternatives are there? In consid ing questions like these the student will ing questions like these the student will class, for which there is no prerequisite, counter many of the issues around which seass, for which there is no prerequisite, philosophical discussions revolve. He will a eves as an introduction to the history of gain some acquaintance with the views of a variable of a variable of a variable of the sease of the philosophers, past and present. Hence the sease on political applications) to philo-ty of philosophers, past and present. Hence the philosophers devices of the philosophers of the philosopher class also provides one form of introduction class also provides one form of infroduces effort class, nowever, designed to be a philosophical study as such. Readings from effort class, with an argument (a "plot") anthology by W.P. Alston and paperbacks by Hills own. In the first term, the classical view of Smith, Ninian Smart, John Hick and Nelson Ph

# 225 Religion and Human Behaviour, let hrs.; F.H. Page.

A study of religion as a form of human exper and behaviour. Can religion be plausibly ex ed in naturalistic terms, for example as a se device or as a merely subjective product of hu psychology? With what human needs main religious behaviour be correlated? How religious experience and behaviour a throughout the life-history of the individual are the concepts of development and matur

# philosophy

be analyzed when applied to religion? How does pe analyze conscience develop in the individual the more is this related to his religious developand now hat is known about the preconditions and consequences of a religious conversion? and part do so-called peak-experiences play in what part development? Are development? what part development? Are drug-induced states nely religious? Are Eastern and Western requestion radically different? Why are westerners frequently attracted to the Eastern western? Are there different types of the ligious ideal, for example, the mystical, pronetic, priestly, intellectual, saintly? An introducory class; no prerequisite.

Readings from Sigmund Freud, G.W. Allport, R.H. nouless, William James, W.H. Clark, and others.

# 030 General History of Philosophy, lect. and eminar: 2 hrs.

the purpose of this class is to help students ascover those philosophic traditions which have dayed a part in moulding western civilisation and persist in the contemporary world. Since the held of study is large, an attempt will be made to oncentrate upon some of the greatest and most fuential of western philosophers.

miracles, intelligible? Is it possible to he tolle, lect. with discussion: 2 hrs.; S.A.M.

be beginning of Western philosophy is studied the Presocratic fragments, and major works of ato and Aristotle.

# U Justice, Law, and Morality, 2 hrs.; D. Baybrooke (Same as Pol. Sci. 2400.)

whical ethics. It is, however, designed to be a formulated by Plato in The Republic and ted in St. Thomas's doctrine of natural law onts the savage realism of Hobbes's than. As the class will learn by pursuing the through the writings of Locke, Hume, am, Mill, and Marx, the concept of justice had a mixed career since Hobbes's time. It len had only a limited and subordinate role; mes it has appeared redundant, even when oundations for choosing solal institutions een claimed. In our own time, a major effort een made by John Rawls to restore justice entral place in ethics. The class will wind up <sup>ccond</sup> term considering his theory, after ex-<sup>ng</sup> a general view (by Stephen Toulmin) of

This is an introduction to some issues in philosophy through the reading of some important literary works. Much modern literature is heavily influenced by philosophical trends; sometimes, in fact, the reader cannot fully appreciate such works unless he or she has an understanding of the philosophical issues and traditions involved. The class is designed for two sorts of students: Those with literary interests who wish to learn about and discuss some of the more important philosophical influences on modern literature; and those interested in philosophy who would like to investigate literary occurrences of philosophical ideas. In addition to the regular two hour weekly meeting there will be optional discussion meetings at various times to be announced during the year. Readings may include short works by Dostoyevski, Melville, Kafka, Beckett, Chekov, Sartre, Camus, Hemingway, and Brecht.

Note. This class is cross-listed as Comparative Literature 270; it may be registered for under that title.

280 Ethics and Medicine, lect. with discussion: 2 hrs.; S. Sherwin.

Moderr, medicine generates many serious medical dilemmas which, by their very nature, cannot be settled on the basis of medical facts and theories alone. Ethical decision-making in medicine, as elsewhere, involves a value component or moral dimension precluding conclusions based entirely on medical facts.

In this course, we shall consider the moral problems of health care in the light of ethical investigations by philosophers. Amongst the problems being discussed will be abortion, euthanasia, informed consent, confidentiality, paternalism and coercion, and the allocation of scarce resources.

A study of fundamental issues in the theory of knowledge. The Autumn term begins with the challenge of Skepticism and the responses of Rationalism and Empiricism, and proceeds to an investigation of 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

the current state of ethics, and a contemporary account (by Lon Fuller) of the extent to which law must be moral to be genuine.

270 Philosophy in Literature, lect., with discussion: 2 hrs.; R. M. Martin.

305 Theory of Knowledge, lect. and seminar: 3 hrs.; R. Campbell and S. Burns.

knowledge of ourselves and other people. Attention is given to Ancient and Modern authors.

The Spring term is a concentrated study of the systematic epistemology of one contemporary philosopher.

Prerequisite: Philosophy 100 or 200 or 201 or 202; or any other course in philosophy and permission of the instructors.

Texts: D.W. Hamlyn, The Theory of Knowledge; G. Harman, Thought.

309 Semantics, two 2-hr. sessions, lecture and seminar; P.K. Schotch.

This is an intermediate logic course in which most of the lecture and seminar time will be devoted to the study of formal semantics and its relation to symbolic logic. Central topics covered will be logical truth, studied in a general setting, the semantics of non-truth functional operators, and many-valued semantics. A large part of the class time will be devoted to a discussion of particular problems with emphasis on acquiring techniques in formal semantics through problem solving..

Prerequisites: Philosophy 200 or 201, or a logic course from the Mathematics Department, or the consent of the instructor.

310 Ethics, lect. with discussion: 3 hrs.; R.M. Campbell

The leading questions in this class are: Can an ethical theory have a rational basis? Can it ever provide a rational solution to practical ethical dilemmas? Utilitarianism, which assesses actions and rules by their consequences for human happiness, purports to provide affirmative answers to these questions. This theory will be studied in the works of Hume and recent empiricists. Discussion of utilitarianism will focus on two issues: Can it accommodate the widely accepted view that ethical assertions express sentiment, not knowledge, since the only real properties of things are those studied in the natural scienes? Does it leave fewer theoretical and practical puzzles unsolved than any alternative theory? In the spring term the class will discuss whether altruism is psychologically possible and whether it is rational to prefer it to egoism. Of particular relevance is Kant's attempt to base ethics on a theory of practical reason. The last question discussed will be whether the standards of utility and justice can be shown to be consistent and rational. The texts are: Frankena, Ethics; Brandt, Ethical Theory; Hume, A Treatise of Human Nature; Smart and Williams, For and Against Utilitarianism; Milo, Egoism and Altruism; Gauthier, Morality and Rational Self-In-Kant, Foundations of the Metaphysics of M Howarth, We Die Alone.

Prerequisite: One previous class in philosoph

315B Problems of Self (Self-Deception seminar: 2 hrs.; S.A.M. Burns.

A study of issues that are both moral psychological concerning persons. Discu for this year will center on the topic of self-deand self-love.

Prerequisite: Philosophy 100 or any two m philosophy classes or instructor's permission

319 Topics in History of Philosonk seminar: 2 hrs.

320 The Philosophy of Hume and Ka seminar: 2 hrs.; T. Tomkow.

A close study of Hume's Treatise of Hum Nature, Book 1, and Kant's Critique of p Reason, disclosing parallel problems and and native responses to them in these works to class will also consider the accounts of some contemporary commentators, and the relevant of these two classics to present philosophiconcerns.

Frerequisite: Philosophy 100 or 200 or 201 or 20 or any other course in philosophy and permissi of the instructor.

# 336 Ancient Philosophy from its beginning to the sixth century A.D., (Sarne as Classe 336), lect.: 2 hrs.; A.H. Armstrong.

Philosophy 336 (Classics 336) surveys the with history of ancient Greek philosophical thous from its beginnings in Ionia in the sixth cent B.C. to the end of the public teaching of Gr philosophy by non-Christians in the sixth certain A.D. Proper attention is paid to the great classphilosophies of Plato and Aristotle studied their historical context: and much emphase laid on the Greek philosophy of the first centur A.D. and its influence on developing Chris thought.

Prerequisite: At least one class in philosophil one in classics, or permission of the instructo

# 338 History of Mediaeval Philosophy, let hrs.; R.D. Orouse.

A study is made of the development of philos in the formative age of European civilization attention given to related political, institut literary and theologica! concerns. The au

# ohilosophy

studied most closely will be Boethius, Anselm of canterbury, Thomas Aquinas, some thirteenthcentury Augustinians and Averroists, Ockham, and one or more of the Late Mediaeval Mystics. the class will be conducted partiy as a seminar, partly as a course of lectures.

prerequisite: Philosophy 100 or 200 or 201 or 202; or any other course in philosophy and permission of the instructor.

345 Theory of Human Action, seminar: 2 hrs.; s Sherwin.

philosophers and social scientists are continually confronted with problems requiring an analysis of human action; in philosophy such questions arise within ethics, philosophy of mind. philosophy of language, and philosophy of social science. In this course, an analysis is sought which will help resolve some of the central concerns about the relation between an agent and an action.

The class shall investigate the nature of action, and seek criteria for individuating, describing, and explaining actions. We will try to reach an understanding of causation with respect to action and to determine the roles played by volitions. intentions, motives and reasons in acting. Theories bearing on the connection between mental states and physical events will also be examined. Further, we will consider the relevant features necessary to assigning responsibility for an action and consider what is involved in the conception of an action as free.

Prerequisite: At least one previous course in philosophy.

346 Problems of Mind, seminar: 2 hrs.; R.P. Puccetti.

These problems of mind will be explored: (1) How are a person's corresponding mental and physical states related? Is the concept of a person, and particularly of his mentai and physical states, exhausted by descriptions of his behaviour? Or, by descriptions of changes in certain parts of his nervous system? Or does the concept of a person require reference to a third entity, over and above his mental and physical states? (2) What kinds of entities might possibly count as persons other than human persons? Could machines do sd? Could organic artifacts? Could non-material enlities? How are we to make decisions about the application of mental and personal concepts to On-human entities? (3) What effects upon tradilional problems of the mind/body relation are indicated by recent neuro-physiological developments, such as brain bisection in humans and in-

by J. Fodor.

347B Freedom and Responsibility, lect, and discussion: 2 hrs.; W.F. Hare.

The purpose of this class is to examine philosophically issues which are significant in many disciplines, such as psychology, law and education. For example, what is meant by saying that a person has a responsibility to do something; and what is a person requesting when he asks to be given more responsibility? If there is a difference here, is it to be explained in terms of the freedom the agent has in acting? But perhaps the possibility is undermined by arguments which purport to show that a person has no freedom to choose his actions? And then in what sense can a person be held responsible for his actions?

Readings will include recent articles by such authors as Pennock, Frankena and Hart, Social Philosophy, by Joel Feinberg.

Prerequisite: Philosophy 100 or 200 or 201 or 202: or any other course in philosophy and permission of the instructor.

A number of philosophers (among them Peter Winch, Charles Taylor, G.H. von Wright) have challenged the application in the social sciences and history of the methods, quantitative and otherwise, used in the natural sciences (explicated in the works of Karl Popper, C.G. Hempel, Wesley Salmon, and others). The challengers hold that in the study of man and society, different methods, occupied with the logic of action rather than with causality and leading to interpretative (or "hermeneutical") explanations, are suitable. This class will try to establish the extent to which this view rightly calls attention to an important non-quantitative branch of social inquiry, most vividly illustrated in anthropological studies of whole cultures. The class will also try to work out the relationship between this branch and the branch or branches of social inquiry in which the

vestigation of animal intelligence?

Prerequisite: Philosophy 100 or 200 or 201 or 202; or any other course in philosophy and permission of the instructor.

Texts: Self-Knowledge and Self-Identity, by Sydney Shoemaker; recent articles on the problem of personal identity, Mentality and Machines, by Keith Gunderson, Psychological Explanation,

351C Philosophy of the Social Sciences, seminar: 2 hrs., meeting every two weeks throughout the year; D. Braybrooke, S. Sutherland. (Same as Pol. Sci. 3496C/5496C.)

example of the natural sciences can be fruitfully followed. In particular, it will discuss the degree to which rules (the standby of the interpretative branch) complement regularities (the standby of the other branch or branches), even fuse with them. The class will also give particular attention to the use - on either side of the divide between the branches, or bridging between them - of the assumption that agents are rational. The application to the social sciences of Thomas Kuhn's concept of paradigm will be kept in mind throughout these stages of discussion. At the end of the year, attention will turn to the contention of such philosophers as Juergen Habermas and Karl-Otto Apel that the social sciences have, besides the tasks of the branches mentioned, a task of criticism ("Ideologiekritik"); and the class will consider how this task might be accomplished.

Prerequisites: A class in research methods or political behaviour and a class in philosophy; or permission of the instructors.

# 355A Marxist Theory and Its Upshot in the World Today, 2 hrs., first term; D. Braybrooke. (Same as Pol. Sci. 3455A/5455A.)

Social objectives inherited from earlier socialist thinkers' inspired Karl Marx's life work and thought. The distinctive features of Marxist socialism, however, come from the combination of philosophical ideas derived (with a number of changes) from the German philosopher Hegel with ideas about economics derived from economists of the British classical school. The latter ideas gave the thought its cutting edge as a critique - which remains surprisingly relevant today - of the social arrangements typical of capitalism. The depth of the critique and its uncompromising character can, however, be explained only by referring to the ideas (about alienation; about fully rational social institutions) taken from Hegel. After identifying in this way the chief ingredients of Marx's teaching, the class will consider various attempts (by Bernstein; Sorel; Lenin; Trotsky) to accommodate Marxist theory to economic and political developments that Marx himself did not anticipate. At the end of the term, it will discuss the official creed of the Soviet Union; and a representative expression of contemporary Western Marxism outside the Communist Party.

Prerequisites: A class in philosophy or a class in political science.

355B Marxism as an Alternative Approach in Contemporary Social Science, seminar: 2 hrs.; D. Braybrooke. (Not offered during the academic year referred to by this calendar.)

This class will discuss the implications for the

study of politics of contemporary Marxist economics (by Western writers like Baran and Sweezy, Mandel and Sherman); the critique of capitalist culture developed by philosophers associated with the Frankfurt School; and Jean Paul Sartre's use of Marxism as a methodology for social science.

Prerequisite: 355A or equivalent acquaintance with the works of Marx and their influence.

357B Philosophy of History, seminar: 2 hrs. D. Braybrooke. (Not offered during the academic year referred to by this calendar.)

The philosophy of history has both an ancient metaphysical tradition and a much more recent analytical one. Both will be studied in this class the metaphysical one by means of Karl Lowith's Meaning in History, and the analytical one by use of A.C. Danto's Analytical Philosophy of History Some attention will also be given to Sir Karl Pon. per's works The Poverty of Historicism and The Open Society and Its Enemies, which deal with both traditions.

Prerequisite: Philosophy 100 or another beginning class in philosophy; or the permission of the instructor. A class or classes in history are of course desirable as preparation.

# 365 Causation and Explanation, lect. with discussion: 2 hrs.: T. Tomkow.

An examination of the nature of caustion and explanation in ordinary life, the law, natural and social sciences. Questions to be treated include the following: What constitutes the relation of cause and effect? Is the causal relation the same in natural science, social science, and in human action? What kinds of things stand in causal relations? How can we distinguish causal sequences from merely accidental sequences? Is every event caused, i.e. is causal determinism true? What is causal explanation? Can an explanation which cites reasons be a causal explanation?

Prerequisite: At least one class in philosophy, or permission of the instructor.

385 Metaphysics, lect. and seminar: 2 hrs. S.A.M. Burns. (Not offered during the academic year referred to by this calendar.)

This class will study some primary questions about the nature of substance and changes, space and time, cause and effect, and (self-)identity.

Prerequisite: Philosophy 100 or 200 or 201 or 202 or any other class in philosophy and permission of the instructor.

# ohilosophy

390 The Philosophy of J.P. Sartre, seminar: 2 hrs.; I.A. MacLennan.

the class will consist of an intensive study of Sartre's Being and Nothingness. However, in the secthe sector of term Sartre's philosophy will be related to, and contrasted with the philosophy of M. Heideg-

prerequisite: Philosophy 217 or 270.

ANB Logics and Languages, seminar: 2 hrs.: PK. Schotch.

This course is intended as a formal counterpart to a course in the Philosophy of Language. During the last 15 years a number of technical breakthroughs have lead to an approach to natural language in which logic, linguistics and to some extent other mathematical disciplines can be utilized jointly. The course will consider such topics as: deep structure and its relation to surface structure, meaning and synonomy, context dependence, and the analysis of ambiguity. The general philosophical context of discussion will he the question of the relation between language and the world.

Prerequisites: Since Philosophy 408/508 is a course of the formal sort, some previous exposure to a formal discipline is necessary. However since the course will be logically selfcontained previous experience in logic is not essential and an acquaintance with the basic concepts of structural linguistics or abstract algebra will serve equally as well.

# 411 Theory of Ethics and Mind, seminar: 2 hrs.; R.M. Campbell.

The topic for this year is self-love. The traditonal analyses of pleasure and desire will be examined. On this basis the class will assess the view that self-love consists in the pursuit of happiness or else in the gratification of desire. Here several issues converge: Is there really any difference between acting from compulsion or under coercion and acting freely? Why is the latter supposed to be preferable? Is it possible to be mistaken about what one desires? What does it mean to determine one's "priorities"? Are they simply one's stronger desires? If so, won't one act on them anyway? Is ambivalence just a conflict beween desires? What does "self-identity" mean in his context? A more adequate conception of selfove should arise from a study of these issues. At inis point the class will analyze and evaluate the vew, endorsed by many psychologists, that effecwe love of others is impossible in the absence of effective love of self. Of particular interest is the gestion that absence of self-love is a moral

structor's consent.

447A Utilitarianism, Classical Liberalism, and Democracy (Seminar in Philosophy, Politics, and Economics), 2 hrs., first term; D. Braybrooke. (Same as Pol. Sci. 4479A/5479A and Econ. 447A/547A.)

This class will be preoccupied with the impact on political philosophy of two leading beliefs characteristic of classical liberalism: 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. These beliefs have been most sharply formulated by economists. The class will trace the first belief from Adam Smith through John Stuart Mill to Milton Friedman; then examine the history of the second belief, which turns on Pareto's repudiation of classical utility (as conceived by Bentham and Mill) and culminate's in Buchanan and Tullock's Calculus and Consent. The class will then give some attention to less restrictive conceptions of democratic government that have grown up alongside classical liberalism. It will read such authors as R.H. Tawney and Robert A. Dahl in the course of doing so. Finally, it will consider the implications for liberalism of certain findings, in the theory of public goods and the theory of games, about the limits of voluntary action.

Prerequisites: Students taking the course should ideally have had previous courses in all three subjects, but it will suffice for them to have worked to an advanced undergraduate level in at least one of them. Students taking the course 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 300-level class in that subject.

448A Social Choice Theory (Seminar in Philosophy, Politics, and Economics), 2 hrs., first term; D. Braybrooke. (Same as Pol. Sci. 4480A/5480A and Econ. 448A/548A.) (This class will not be given during the year referred to by this calendar; it will be given the following year.).

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

Prerequisites: Either Philosophy 201 and 212 (one may be taken concurrently) or 201, 305, 310 and 345 (two may be taken concurrently) or the in-

seemed to lead two traditions of thought to final ruin. One tradition, begun in the 18th century by Condorcet and continued in the 19th by Lewis Carroll, is the theory of voting. The other tradition is welfare economics - the theory of economic recommendations - which has had a drastically inhibited history since Pareto led economists to abandon the notion of interpersonally measurable utility. Its inhibitions, which are reflected in Arrow's work, have not saved it from his attack. This class, after tracing the two traditions that converge in Arrow's theorem, will study the theorem itself and then consider (with the help of such writers as A.K. Sen and Charles R. Plott) the continuing disarray into which formal social choice theory (and hence the basic theory of democracy) has been thrown by the theorem.

Prerequisites: Students taking the class should ideally have had previous classes in all three subjects, but it will suffice for them to have worked to 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 300-level class in that subject.

449B 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 Pol. Sci. 4490B/5490B.) (This class will not be offered during the academic year referred to by this calendar.)

450 Philosophy of Language, seminar: 2 hrs.; R.M. Martin.

The elements of languages have meaning, but what is the meaning of 'meaning'? Various theories of meaning will be examined. Related issues of philosophical importance will also be discussed (e.g. the analytic/synthetic distinction; synonymy).

Prerequisite: Philosophy 100 or a logic class, and at least one class beyond the 100 level in analytic philosophy; or by permission of the instructor.

460 Contemporary Philosophy of Religion, seminar: 2 hrs.; F.H. Page.

A striking feature of quite recent philosophy has been the amount of activity in the field of the philosophy of religion. The seminar investigates examples of this current interest. Students will he admitted at the discretion of the instructor. Som acquaintance with the traditional problems of the philosophy of religion together with some familiarity with twentieth century philosophil would be an advantage.

# **499 Directed Reading**

Members of the Department.

# physics

physics

professors W.J. Archibald M.G. Calkin G.K. Hoyt MH. Jericho M.J. Keen (Oceanography and Geology) G.F.O. Langstroth H, March (Chairman)

Associate Professors B.L. Blackford G. Cordes n.J.W. Geldart p.B.I. Kiang W. Leiper R. Ravindra PH. Reynolds A.M. Simpson

Assistant Professors D.F. Goble **B.E.** Paton c.G. White

**Research Associate** C. Blaauw

Instructor G. Stroink

Senior Demonstrator F.M. Fyfe

**Postdoctoral Fellows** N. Niegawa W.A. Roger

We are surrounded by complex objects. A transistor radio is a typical example; their size and complexity varies enormously but the common element is the partnership of basic science and technology which has produced them.

We are also surrounded by simple and subtle phenomena not made by man. A rainbow, or the waves on the shore may cause us to look and, perhaps, cause us to wonder.

The science called 'physics' is for those who "onder. The teachers of physics will strive to im-Part not only basic knowledge. In addition, and often at the same time, students will be helped to develop the skills required to connect seeming unrelated events or observations, and via this conrection to come to an understanding of a physical concept.

physical concept is a powerful weapon for hose who wish to mould their wonder and curiosity into a systematic scientific inquiry, whether this inquiry concerns a rainbow or a

In the study of these and related subjects, deductive skills are encouraged and practiced; these skills can then be used to study more subtle physics, or carried over to any discipline which may be the goal of a student.

There are four first year classes. They give a general introduction to the subject and cover to a varied extent the more modern aspects of physics - relativity, properties of nuclear radiations and quantum mechanics. 9

Physics 100 is a survey class requiring no previous preparation in physics and offered primarily for students in arts or a pre-professional programme.

Physics 110 is intended for students intending to make a study of enginering or a physical science. Previous background in physics is helpful but not essential.

Physics 130 is an introductory physics class which is oriented towards the medical sciences.

Physics 128A and 131B are primarily for students headed for the study of Engineering.

For second and subsequent years, an important part of the course each year after the first is the laboratory work which establishes a connection between the theoretical and mathematical ideas of the lectures and the world of physical reality. In the third and fourth years the student is encouraged to follow his own interests as much as possibie, both by designing and carrying out experiments of his own choosing in the laboratory and by selecting suitable classes from amongst the electives available.

General Degree/Major in Physics Students intending to major in physics should in-

clinical diagnosis. For example, only a few concepts are required to understand classical mechanics - the study of force and motion. Material objects are found to behave predictably; they can be said to obey 'laws'. Waves of various sorts, such as light and sound, also obey laws and a knowledge of these laws will help us to understand the behaviour of an optic or acoustic system, or, more important, to predict the behaviour of an untried system.

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Electricity and magnetism form an important part of elementary physics. In several classes the nature of electric and magnetic forces is discussed. This collection of physical phenomena includes such distant cousins as a toy electric motor and an extensive communications network.

# First Year Classes

## Degree Programmes

clude Physics 110 and Mathematics 100A and 101B in their first year programme. Physics 100 and 245 may not be included in a 'Major' and at least one 300-level class must be included. Physics 340 may not count as the only 300-level class.

Students wishing to take a general degree in Physics might be interested to note that P110 and the four non-honours-oriented courses at the 200level (P221, P222A and 223B, 230A & 233B, and P250) between them cover essentially all of the major topics in Physics. This 'package' includes: a general introduction to physics, astronomy and cosmology, elementary nuclear physics, introductory quantum mechanics, relativity and atomic physics.

Students interested in both physics and biology may wish to examine the section on 'Combined Honours'. The first three years of the 'Biophysics' combined honours programmes constitute a three-year B.Sc. (General Degree) programme which has been put together by both departments. Again, it should be noted that alternatives are available for specific classes in this programme of study.

B.Sc. Major in Physics (example only, other possibilities exist):

Year I, 110 (Math 100A & 101B), science, arts, elective.

Year II, 221, 230 (Math 200 or 220), science, elective.

Year III, one or two of 222A and 223B, 250; one or two of 300, 315, 320, 335, elective(s).

# **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.

## Yearl

1. Chemistry 110. 2. Mathematics 100A & 101B. 3. Physics 110. 4. Arts or Science elective. 5. Arts elective.

Year II 6. Science elective. 7-8. Two mathematics' classes. 9-10. Physics 211 and 231.

# Year III 11. Arts or Science elective. 12. Class in Mathematics. 13-15. Physics 300 and two other physics classes.

## Year IV

16. Arts, science or mathematics elective. 17-20. Four physics classes at the 400 level one of which will normally be Physics 400.

# **Combined Honours**

Physicists study, and try to understand, the fun damental laws of nature. Because of this physicists find themselves becoming increasing ly involved with other sciences where attempt are being made to understand the phenomena a well as to describe them. For example, geologiste have mapped the magnetic field of the Earth and are now working with physicists, trying to explain the underlying mechanisms. Biologists and physicists are collaborating on studies of diffi sion through cellular membranes, as well as on a variety of other topics.

It is important, therefore, to have scientists with training in more than one subject.

All manner of combined honours physics programmes can be generated. Two cases where details of such programmes have been worker out are combined honours with GEOLOGY and with BIOLOGY. Details of a possible 'Geophysics' programme are included in the Geology section of the Calendar. A possible programme for students wishing to do a 'Biophys' cs' combined honours programme is outlined below:

# **Combined Honours Physics and Biology** Yearl

Physics 110 Biology 2010A, 2030B Math 100A & 101B Philosophy 100 Language or Social Science

## Year II

Physics 221, 230 Biology 2000 Math 220 Chem 110

## Year III

(one of) Physics 315, 320, 335 Biology 2020A, 2040B Biology 3021B, 3031B One other Biology or 300-level Physics Elective

## Year IV

One Biology (e.g. Biology 3030B) or one **300-level Physics** Physics 3000 Chem 230 or 241 Half-class in Biology + Physics 470B Physics 340/Biology 3400/History 310

Students contemplating these, or any other co bined honours programme may obtain furth

# physics

details from the Department, and should in any case consult the Departments before the beginning of their second year of study.

100 General Physics, (2 sections), lect.: 3 hrs.; problem session: 2 hrs.; C.G. White, C.K. Hoyt.

This is a survey class requiring no previous preparation in physics and offered primarily for students in arts, pre-medicine and pre-dentistry. It will not normally be accepted as a prerequisite to advanced classes in physics.

the class surveys physics from its beginnings to the present day. The four major topics are: Newtonian mechanics (motion, force, mass, momenum, energy); electromagnetism (charge, electric and magnetic forces and fields); relativity (space. time, mass, energy); quantum theory (elementary narticles, atoms).

the major topics are dealt with mainly in historical sequence. To a large extent the ideas in later topics are built on the ideas presented in earlier topics. In particular, the four major topics mentioned are not at all isolated from each other, but are rather closely inter-related.

Throughout the class, mathematics is used as a language, for expressing the basic ideas of physics and also for deductive reasoning from these basic ideas. The mathematics used is not in advance of high school algebra and trigonomentry, but some time is spent in the class developing greater facility with high school mathematics. It must be stressed that mathematical formulae are not used simply for "plugging in" numbers; rather, the emphasis is placed on a thorough understanding of the meaning and range of applicability of the formulae.

A large part of the class consists of developing understanding of physical principles through specific problems. For this reason, there is a 2 hour session each week during which students do problems with the assistance, when required, of the lecturer and graduate students. The problems are linked closely to the lecture material, and sometimes extend the subject matter of the lecures. The problem sessions are conducted inormally and students are free to discuss the problems with each other as they work. There are <sup>10</sup> laboratory experiments in this class.

ext: J.B. Marion, Physics and the Physical Iniverse, Wiley.

10 General Physics, lect.: 3 hrs. (2 secons); tutorial: 2 hrs.; M.G. Calkin, D.F. oble

tial.

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 and the properties of light to the optical system of the eye. Using this practical approach, the following major topics will be treated: a) mechanics, b) properties of matter with the emphasis on fluids and gases, c) wave phenomena, and d)electricity.

Students will be able to assess their progress by the results of quizzes given every second week. Every week they can discuss their assigned problems or other problems related to the course during informal tutorial sessions. Four laboratory experiments, which are scheduled for the month of January, stress the importance of basic concepts

This class introduces the student to the elementary physical laws of our universe and the way in which these laws are used to forecast such natural events as the flight of a projectile, the relativistic variation of mass, the flow of electrical current in a circuit, etc. Newton's laws, for example, are stated and then one proceeds by asking "what do these laws say about the positon of a projectile after a certain time has elapsed?" Intuitive reasoning or educated guessing is eliminated. Reasoning of this kind requires moresophisticated mathematics than one normally uses in high school and consequently a considerable fraction of the first few weeks of lectures is used introducing such topics as vector algebra, differential calculus and integral calculus.

Throughout the year students will have an opportunity to assess their progress by the results of fortnightly quizzes which are given during afternoon tutorials. These tutorials replace the conventional laboratory work and give the student ample time to discuss his problem with the tutor. Most of the experimental work is confined to lecture room demonstrations.

Students beginning this class should be familiar with trigonometry, the solution of quadratic equations, binomial expansions and should now be prepared to start vector algebra and differential calculus. Previous work in physics is not essen-

# Text: Tipler, Physics, Worth, 1976.

130 Physics In and Around You, lect.: 3 hrs., tutorial: 2 hrs.: G. Stroink

This course gives an introduction in physics for students in biology, premedicine, predentistry and allied health sciences. It will not normally be accepted as a prerequisite to advanced classes in

in Physics to phenomena in biology and medicine. Many demonstrations will also be shown in class.

Students beginning this course should be familiar with trigonometry, solving algebraic equations, and should be prepared to study some basic algebraic functions.

Text: Physics for the Life Sciences, by A.H. Cromer.

128A Mechanics and Waves, lect.: 3 hrs.; laboratory: 3 hrs.

Physics 128A is similar to the first half of Physics 110. It is specifically designed for those who wish to keep open the option of a B.Sc. or a 4-year Engineering degree (or both). Covered are vectors, static equilibrium; momentum, force and acceleration; and simple harmonic motion. Because of laboratory constraints, the enrolment in this class will be limited.

Prerequisite: N.S. Grade XII Physics.

131B Electricity and Magnetism, lect.: 3 hrs.; laboratory: 3 hrs.

This class is similar to the second half of 110, in that it deals with electricity and magnetism. It is primarily intended for engineers but other students may enrol. The basic ideas of electricity and magnetism will be developed, leading to an introduction to a.c. circuit theory and electromagnetic wave propagation.

Prerequisite: Basic knowledge of Newtonian mechanics.

211 Mechanics, lect.: 3 hrs.; lab.: 3 hrs.

## and

231 Electricity, lect.: 3 hrs., lab.: 3 hrs.

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 110 and Mathematics 100A & 101B. (Statistics have shown that a student with less than a "B" grade in Physics 110 can be expected to have difficulty with 211 and 231.

It is assumed that students are familiar with elementary mechanics and the concepts of work, energy and momentum as developed in Physics

110; and with the application of simple integral and differential calculus to the solution of physical problems.

# 211 Mechanics

The class is divided into 2 parts: mechanics and wave motion. The first part deals with basic vector mathematics and its application to physics Newton's laws of motion and the description of motion is 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. The last topic in the first part of the class is harmonic oscillation which provides an introduction to the second part, wave motion. In the study of wave motion examples are taken from many branches of physics: mechanics, electromagnetism, quantum theory. Fourier analysis of wave packets and pulse will be included.

Text: Berkeley Physics Course, Vol. 1 Mechanics McGraw-Hill, 1965; Berkeley Physics Course, Vol 3 Mechanics, McGraw-Hill, 1965; Berkeley Physics Course, Vol. 3 Waves and Oscillations McGraw-Hill, 1965.

# 231 Electricity

The material discussed in this class forms part of the Berkeley Physics Course. The class begins by studying electrostatics, distributions of static charges, and 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 problem's 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 magentic field is introduced and its properties discussed. The relationships between electric and magnetic fields are then studied and it is shown how these relationships imply the existence of electromagnetic radiation. 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.

Students are expected to have an introductory knowledge of the nature of electric charge, elec tric field, magnetic field, and of electrical current as developed in Physics 110.

Text: Berkeley Physics Course. Vol. 2 Electriciti and Magnetism, McGraw-Hill, 1965.

221 Applied Physics, lect.: 3 hrs.; lab.: 3 hrs.

physics B.E. Paton.

Applied Physics is a new course designed to acstudents with the wide range of physical ciples at play in the world around us. These ciples will be discussed in class but the major masis will be on the practical aspects of wsics. For example, we will be examining wave anomena in gases (light, sound and microphenol, in liquids (ocean waves), and in solids hanical resonance and physical electronics). Before the year is out, you will have had a taste of police, solid state physics, thermodynamics, atomic physics and any other field our imaginaion or time allows us to study.

in the lab, you will see physics in action and to some extent be able to experiment yourself. You have a chance to see and use modern scienfic instruments such as the oscilloscope, operaional amplifiers, and lasers. Labs will dependentiate the scientific method of experimentation and how to analyse data. It is hoped that you will learn to apply principles of thysics and modern measuring techniques in the solution of practical problems found in the world of science and technology.

This course is designed for science students who want to see physics in action. It has Physics 110 as a prerequisite although exceptions have been made for students who seriously want to become familiar with the practical aspects and the tools of physics. Students taking the course should have ad some exposure to calculus, complex exconential functions and vectors.

Text: To be announced.

222A Radiation Physics, lect.: 2 hrs.; lab.: 3 Ms.; G.F.O. Langstroth. Offered in alternate years commencing 1976-77.

is class involves the dimension of the properof radiation and the physical principles led to them. The nature of atomic and nuclear itions, some of their effects on biological erials and their measurement will form the is for the class. Presentation of the material avoid the use of calculus wherever possible. isit to the Radiology or Nuclear Medicine Partment of a local hospital will be included to trate the application of radioactive isotopes devices in the medical field.

eight laboratory sessions will be arranged 9 the term to afford students an opportunity come acquainted with simple measurement ques and the use of basic instruments for etection of nuclear radiations.

quisites: Any first year physics class, or apal of the instructor.

2nd ed.

223B Radiation Physics · Some Applications, lect.: 2 hrs.; G.F.O. Langstroth. Offered in alternate years commencing 1976-77.

This class follows on the background obtained in Physics 222A, which is a prerequisite. Topics will vary according to the interests of the students, but may include discussions of fission and fusion as means of electrical power generation, environmental questions arising from the use of reactors and nuclear weapons, and the applications of accelerators and other devices for high energy research.

Text: D.R. Inglis, Nuclear Energy. (It is assumed that students will possess the textbook for Physics 222A.)

# 230A/233B

These two half-courses are designed for second year science and engineering students who wish to take a second class in physics, in addition to Physics 221, or who for some reason are unable to take that class. Students may take third year physics classes if they have taken this class and Physics 221.

# 230A Mechanics, lect.: 3 hrs.; C.G. White

This class deals with the basic laws of classical mechanics. It covers similar material to that of Physics 110 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 rotational and vibrational motion. A brief discussion of special relativity is also given.

101B.

Text: Kleppner and Kolenkow, An Introduction to Mechanics, McGraw-Hill, 1973.

C.G. White.

This class deals with 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.

# 161

Text: Howard L. Andrews, Radiation Biophysics,

# Prerequisite: Physics 222A.

Prerequisite: Physics 110, Mathematics 100A and

233B Electricity and Magnetism, lect.: 3 hrs.:

# Prerequisite: Physics 230A.

Text: Armstrong and King, The Electromagnetic Interaction, Prentice-Hall, 1973.

# 231 Electricity

See description with Physics 211.

# 245 Planetary Science and Astronomy, lect .: 3 hrs.; P.H. Reynolds, R.H. March.

This course is aimed at developing an understanding of our physical environment, both on the scale of the solar system and on the scale of the universe. It is designed for the general science student, not the physics specialist.

We shall use some of the major findings of geophysics and oceanography to study the Earth as a planet. We shall discuss the contributions made by the space programme - for example, the Apollo flights to the Moon and the Mariner and Viking flights to Mars. The constitution, age and origin of our solar system will be considered as will the interactions of its component parts (for example, Earth-Moon and Solar-planetary interactions).

The second part of the course will consider stars their origin, constitution and evolution with time; the structure and age of our Galaxy and the universe of galaxies; pulsars, quasars and other recent interesting developments in optical and radio astronomy; and finally, various cosmological models.

There will be semi-regular evening observing sessions and occasional visits to Saint Mary's University's Burke-Gaffney Observatory.

Prerequisite: One first-year science course.

Texts: Wyatt and Kaler, Principles of Astronomy, Allyn and Bacon, 1974; The Solar System, Freeman, 1975.

250 Astronomy and Introductory Astrophysics, lect.: 3 hrs.; P.H. Reynolds. Offered in 1977-78 and in every other year.

This is a basic course 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.

I. The Solar System: the Earth, Moon, meteorites and planets; planetary motions and celestial coordinate systems; the origin and age of the system. II. The Stars: their distances and motions; the motion of the Sun; magnitudes, luminosites, col-

ours and stellar spectra; building stellar mod - the Sun as a star; variable stars; binary systems; clusters of stars; interstellar gas dust; stellar evolution.

III. The Galaxies: structural features dynamics of our Galaxy; particular features of exterior galaxies.

IV. The Universe: simple cosmological models

The class will join P245 for evening observing is above).

Prerequisite: Physics 110 or Physics 100.

Text: Smith and Jacobs, Introductory Astronom and Astrophysics, Saunders, 1973.

# 300 Experimental Physics, lab.: 6 hrs.; len 1 hr.; A.M. Simpson, B.L. Blackford.

electronics. A measurement of one of the lun damental constants such as c, G or e is require

field of experimental study.

Prerequisite: The class is designed for honous Ryder, Electronic Fundamentals. students and has Physics 231 as a prerequis For Physics students, two other physics classed History of Science, lect.: 2 hrs.; tutorial: must be taken concurrently. Exceptions has been made.

315 Modern Physics, lect.: 3 hrs.; D.J. Geldart.

This is an introductory class in quantum phys The first term deals mainly with basic quan mechanics. In the second term, selected topic atomic physics, low temperature physics, nut and particle physics, will be discussed. When possible, attention is drawn to the current tre in physics research.

Prerequisite: Mathematics 200 or its equivalent

Text: Tipler, Foundations of Modern Phys Worth Publishers, Inc. (1969).

Supplementary readings: Selected articles Scientific American and American Journal Physics.

320 Thermal Dynamics, lect.: 3 hrs. Kiang.

class studies the basic principles of ical mechanics and the relation that they to thermodynamics together with the apof these principles to the study of ideal and certain physical systems.

requisite: Some knowledge of partial atives: Mathematics 200, or its equivalents, may be taken concurrently with the class.

To be announced.

vsics

# Electronics, lect.: 3 hrs.; A. Levin.

class covers advanced circuit analysis of and non-linear systems, the physics and ting properties of solid state devices, the ents of information and noise and transmislines and filters.

A class in experimental physics designed to give spics treated: network reduction, the 4 terminal students a chance to do non-set experiments are ework and solutions by matrix methods, nonthereby encounter and solve on their own the sar systems, modulation, demodulation and problems of experimentation. As the number dification, carrier transport in semi-conexperiments is small (four to six), students show dors, properties of diodes and transistors; achieve a real understanding of a few physic cromechanical analogs and analog computaphenomena. Topics for experimental study cover methods, feedback and control systems. a wide range of fields such as atomic physic plity criteria, nature of information and noise, mathematical physics, solid state physics an werties of distributed constant lines and

other than this the student is free to choose the requisite: Physics 230 or Physics 231, ematics 220 or 228 to be taken concurrently.

R. Ravindra (Physics), J. Farley ogy). (Same as Biology 3400 and History Class description to be found under gy 3400.)

Advanced Physics Laboratory, lab.: 6 Levin, S.T. Nugent.

is a physics and engineering-physics tory class in which students in groups of Nork largely on their own initiative. The exintal work covers nuclear disintegration, and beta spectroscopy and absorption rements, proton spin quantitative measureand Planck's constant determiniation; theremission and ionization experiments vacuum pumping and instrumentation, properties of solid state semiconductors evices; experiments on the spectral noise ution of transistors and the use of analysis s; experiments with a Helium-Neon laser, phy, etc. If they wish, students may do exints in other areas, such as acoustics, opid dynamics. A report, on a topic to be with the instructor, is required as part of

# this class.

structor.

Ravindra.

405A Electromagnetic Theory, lect.: 3 hrs.: S.T. Nugent.

Topics include a review of electric and magnetic fields emphasizing the solution of Laplace's and Poisson's equations. Maxwell's equations are discussed and are used to explain plane waves in infinite media, reflection and refraction, transmission lines, guided waves, resonators, radiation and antennas.

and Waves.

In the second term the class will study electrodynamis, covering topics such as electromagnetic waves, radiation from antennas and from moving charges, energy loss of charged particles passing through matter, plasma physics, semi-classical theory of radiation.

Texts: Goldstein, Classical Mechanics, Addison-Wesley; Jackson, Classical Electrodynamics, Wiley.

Topics discussed include: experimental basis of the Lorentz transformation relativistic kinematics: space-time; introduction to tensor calculus, relativistic dynamics; relativistic electrodynamics.

mission of the instructor.

Text: T.B.A.

Prerequisite: Fourth-year standing in physics or engineering- physics or permission from the in-

402B Special Topics in the History and Philosophy of Science, seminar: 3 hrs.; R.

Text: Lorrain and Corson, Electromagnetic Fields

410 Advanced Classical Mechanics and Electro-dynamics, lect.: 3 hrs.

In the first term the class will study Lagrangian and Hamiltonian mechanics, covering, for example, the material in Goldstein, Chapters 1, 2, 3, 7, 8, 9, 10; Lagrange's equation, Hamilton's principle, the two body central force problems, Hamilton's equation of motion, transformation, the Hamilton-Jacobi equation.

411B Special Relativity, lect.: 3 hrs.

Prerequisite: Physics 211, 231 and 315 or the per-

415 Quantum Mechanics, lect.: 2 hrs.

Topics discussed include: concepts and formulation of quantum mechanics, harmonic oscillator, potential well and barrier, angular momentum and the central force problem, perturbation methods, scattering theory.

Prerequisite: Physics 315. Students should be familiar with elementary wave mechanics and with the mathematics necessary to discuss the Schrodinger wave equation.

# Text: T.B.A.

# 416 Mathematical Methods of Physics.

Topics discussed include: ordinary differential equations, complex variables, integral transforms, special functions, partial differential equations, eigenfunctions, eigenvalues, Green's functions, scattering theory, perturbation theory, integral equations and calculus of variations.

Prerequisite: Registration requires prior departmental consent.

Texts: Arfken, Mathematical Methods for Physicists (2nd ed.), Mathews and Walker, Mathematical Methods of Physics (2nd ed.).

# 423A Introduction to Solid State Physics, lect.: 3 hrs.; W. Leiper.

This class introduces the basic concepts of solid state physics which are related to the periodic nature of the crystalline lattice. Topics will include crystal structure, X-ray diffraction, phonons and lattice vibrations, the free electron theory of metals, and energy bands.

Prerequisite: Physics 315. Registration requires prior departmental consent.

Text: Kittel, Introduction to Solid State Physics, 3rd ed., Chapters 1-9 Wiley, 1966.

433B Materials Science, lect.: 3 hrs.; H.W. King.

This course applies the principles of solid state physics to the study of real materials. Physical properties are shown to have intrinsic symmetry which interacts with the symmetry of the crystal structure of the material, thereby defining the number of coefficients necessary to completely describe the property. The concept of thermodynamic equilibrium, governed by diffusion in the solid state, is discussed as the basis for a description of the microstructure of metals and alloys. Although solid state properties such as electron transport, magnetism, semiconductors, superconductors and the optical properties of dielectrics and semiconductors owe their existence to the quantum properties of electro is shown that in practice, the magnitude of properties is strongly influenced by structural effects such as solid solution allo crystal defects, grain boundaries, textures plastic deformation.

Prerequisite: Physics 315, preferably Physics 423A, and permission from the instru Registration requires prior departmental conse

Text: Hutchinson and Baird, Physics of Engine ing Solids, Wiley 1968.

Reference: Nye, Physical Properties of Crystal Oxford Univ. Press, 1969.

435A Electronic Techniques for Energy Cha version, lect.: 3 hrs.; A. Levin.

This course discusses the properties, efficie and uses of energy conversion systems based electronic techniques. Topics discussed inclusion thermojunction generators and refrigerator solar generators, thermionic generators, fuel centres is a class in solid-earth geophysics. Topics and related devices.

Techniques in Energy Conversion.

Nugent.

Topics discussed include: electromagnete theory, the propagation of rays and optical beam optical resonators, interaction of radiation and atomic systems, theory of laser oscillation some specific laser systems, second-harmon generation, parametric oscillation, electro-opti modulation and optical detectors.

Text: Yariv, Introduction to Optical Electronics

444A Optics, lect.: 3 hrs.; C.K. Hoyt.

Topics include a detailed study of the radial from accelerated charges, the statistical prot ties of the fields from assemblies of radiators terference, diffraction, with attention to the proximations of the Kirchhoff theory, and the plication of Fourier transforms to the structure images, the resolving power of instruments<sup>2</sup> the characterization of coherence.

A few topics in geometrical optics may be in ed to assist in understanding the behaviour tical instruments and to provide a backgroun the better appreciation of some of the topic physical optics.

Prerequisite: Physics 230, or Physics 231 Physics 221 and Mathematics 220. The stud

# SICS

d be familiar with vector analysis, Maxwell's ions and the use of complex exponential ions. Registration requires prior departmennsent.

stone, Radiation and Optics, McGraw-Hill, 3.

optics, lect.: 3 hrs.; C.K. Hoyt.

class is a continuation of Physics 444A and with coherence, polarization, scattering by the electromagnetic properties of matter, ding crystals, reflection, refraction and doufraction.

equisite: Physics 444A. Registration requires departmental consent.

stone, Radiation and Optics, McGraw-Hill, 3 assigned readings on related topics.

Physics of the Earth, lect.: 3 hrs.

ussed include: the figure of the Earth and ty, seismology and the internal structure of Reference: Levine, Selected Papers on Net Earth, the geomagnetic field, paleomagnetism he prehistory of the geomagnetic field, heat and the Earth's thermal history, electrical 440B Optical Electronics, lect.: 3 hrs.; st aduction in the Earth, radioactive processes in the age of the Earth, global geophysicsinental drift and sea floor spreading.

ght concurrently with Geology 429.

equisite: Registration requires the prior conof the Department.

t Stacey, Physics of the Earth, Wiley, 1969; and, Introduction to Geophysics, Mantle, and Crust, Saunders, 1971.

General Relativity and Cosmology, 2 hrs.; R. Ravindra.

troduction to the General Theory of Relativiased on theoretical and experimental conlations, with emphasis on the physical prins rather than mathematical details. The y will then be applied to modern physical

quisite: Consent of instructor.

Analog and Digital Instrumentation for llists, lect.: 2 hrs.; lab.: 2 hrs.; B. Paton.

every laboratory instrument in use today is Dased on electronics. In order to master the on of an instrument, one must have suffiknowledge of the electronic circuitry to " the flow of information from its origin (sen-

sor) to its ultimate destination (meter or computer). With the advent of the integrated circuitry, complex circuitry can be built by adding together groups of simple building blocks. A course will be offered to acquaint graduate students with these building blocks, in the hopes that they will be able to understand laboratory instruments and perhaps even design their own. The major emphasis will be on the practical use of electronic circuits. Techniques and devices will be covered in lectures but only on a non-mathematical basis. The lectures will stress: what is the device, what are its characteristics, and how can it be used. These ideas will be reinforced by a lab where the student can see the device, measure its characteristics, and use it in a circuit. The student may progress at his own rate from a simple a.c. preamplifier to a digital voltmeter.

This is an interdepartmental course in practical electronics open to all science graduate students. The course is given only on alternate years and is limited to sixteen students.

Texts: Vassos and Ewing, Analog and Digital Electronics for Scientists, Wiley-Interscience.

**Graduate Studies** The Department of Physics provides course 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**

## Professors

J.H. Aitchison J.M. Beck D. Braybrooke K.A. Heard M.K. MccGwire D.W. Stairs

## Associate Professors

P.C. Aucoin (Associate Director, School of Public Administration) R. Boardman D.M. Cameron (Director, School of Public Administration) R.L. Dial D.J. Munton D.H. Poel, Chairman G.R. Winham (Director, Centre for Foreign Policy Studies)

# **Assistant Professor**

P. Brown R. Eden T.M. Shaw S.L. Sutherland

## **Research Fellows**

H. MacDonald J.A. McDonnell C.M. Newbury G. Skogstad D. Swanson

"Politics: Who Gets What, When, How!" So one political scientist has defined his subject. It is a definition, some might say, for cynics. Still, it captures what many people regard as the essence of politics. It also suggests a large part of what political scientists are constantly trying to find out. Of course, their interests vary, and so do their methods. Some, for example, are interested in the exercise of power within the nation-state. Who are the 'rulers'? Where do they come from? How do they get there? Whose interests do they serve? Under what constraints do they function? In pursuit of answers to questions as fundamental as these, political scientists are drawn to investigate, among other things, the functions and practices of political parties, the attitudes and perceptions of voters, the objectives and tactics of pressure groups, the origins and capacities of legislators, the processes and actions of governments. For many, the principal concern is to deal with these problems, and dozens of others like them, in the context of a single country -Canada, for example, or China, or Tanzania. Others seek to discover patterns of a more general kind, which they try to expose by examining a variety of countries and comparing the political phenomena of each. From this type of research they may hope, for example, to learn why some countries appear to be politically more "stable" than others. Or they may want to know how it happens that in some societies armed

forces, exercising their monopoly over ultimate instruments of brute force, seize coof the government, whereas in others they rem placidly obedient to the commands of politie And so also with an almost endless variety questions of a similar sort.

Other political scientists, although still very m concerned with the play of political forces with the nation-state, focus their attention some more narrowly on what we might call the "no machine" - the complex mix of political leade bureaucratic administrators, and technical perts whose job it is to decide what the "government ment" will actually do. The process by white these decisions are made is an intricate one con plicated by the fact that bureaucracies of govern ment, like bureaucracies everywhere, have political life of their own. To study this process assess its implications, to consider the fulness of various possible remedies (whe remedies are required) - these are among the students concentrating in Political Science may preoccupations in particular of specialists 'Public Administration".

tion of "Who Gets What, When" is sometimes set or may consist of a general selection of courses tied only by the most violent and destructive or mathe offerings listed below. means. It is partly the function of political sci tists who specialize in International Politics to magirements vestigate the origins and conduct of the foreignorder to meet the requirements of a major propolicies of particular states - to discover, ine mme, a student must take at least four, but no fect, why they individually behave in the way the we than eight, classes in political science in addo. It is also their function to examine the work don to an introductory class. All major students ings of the internatinal community as a whole- would take at least two full classes from among to distinguish, for example, the causes of ## #second-year level offerings and these classes from the conditions of peace and to evaluate the sould be selected from at least two sub-fields. effectiveness of alternative means of securing maintenance of international stability. In dealer kond-year Classes in Sub-fields with such questions they are led to examine the adian Government and Politics principles of nuclear deterrence, the workings PS. 2200R Canadian Government alliance systems, the functioning of the balance of power, the politics of the United Nations. concept of imperialism, and a host of other diverse, yet inter-related, phenomena.

It will be obvious that the emphasis in the various political science pursuits is on the stures 2330R Politics Through Literature of politics as actually practised in the wo around us. But many political scientists wo agree that this is only a first step, and that should also address ourselves to questions ing to do with how politics ought to be. It is after all, simply self-evident that political leadshould be subject to election, or that ign men should have the same voting powe educated men, or that we should be allow spend our money as we please, or that the spend our money as we please, of that the la year Programme merit in the principle of equality before the la year Programme Issues of this sort have been debated by reflect the year programme does not necessarily hap-

# uitical science

for thousands of years, and none of them has dafter careful examination that the answers easily. To consider the very difficult probraised by these sorts of questions is the ipal task of political philosophy. It is a task h lies at the core not merely of politcal but of political life itself.

dents who are interested in these various ds of inquiry within the discipline of Political will find all of them represented in the ss offerings and programmes outlined below. will wish to specialize, while others may at to pursue interests in a number of different as. In either case, the members of the Departwill be happy to offer whatever advice and sistance they can in the development of any dent's personal programme of studies.

# Degree Programmes

the a one-year, two-year, or honours programes. The specific courses to be taken in each innidual programme are chosen in consultation The pursuit of politics is not, of course, confine the faculty advisor from the Department in acto the internal affairs of national communities and ance with the general requirements listed extends as well the world at large, where it can show. Undergraduate programmes may em-become a raw and brutal game in which the quest satisfies one of the sub-fields of Political Science

parative Government and Politics 2300R Comparative Politics 8.2305R European Comparative Politics .2321B Political Behaviour. 2325R The Theory and Practice of Govment in the United States cal Theory and Methodology. 2400R Justice, Law and Morality 2405R Political Philosophy: Stoics to the of the Fifteenth Century 2494A Introduction to Political Inquiry 2495B Introduction to Political Inquiry ational Politics and Foreign Policy 2500R World Politics 2510R Canadian External Relations

sociology.

Two-year Programme in political science.

Honours Programme An honours programme will normally consist of a first-year level class and not less then 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 firstyear class, including the honours essay. The intent of this recommendation is to encourage our honours student to take supporting class work in related disciplines.

For the purposes of the honours programme the Department has designated five second-year classes as honours core classes. Four of these core classes represent the political science subfields of Canadian politics, comparative politics. political philosophy and international politics and the fifth represents the methodological basis for each of the sub-fields. The five 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 International politics: P.S. 2500 World Politics Methodology: P.S. 2494A/2495B Introduction to Political Inquiry

An honours programme in political science will include: (i) at least three core classes, two of which must be P.S. 2400 Justice, Law and Morality and P.S.

pen within the time span of one university year but will consist of four or five classes in Political Science in addition to a first-year level class. Students chosing to complete a "one-year" programme in political science will probably be pursuing what the Faculty of Arts and Science calls a "co-ordinated" programme. That is, a student undertaking a "one-year" programme in political science will also be undertaking a "one-year" programme in some related discipline such as economics, history, philosophy, psychology or

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A two-year programme constitutes the standard "major" in political science. In addition to meeting the general requirements noted above under Requirements, the student should take at least two classes from third-year level offerings. These will be chosen in consultation with the faculty. Professor K.A. Heard is the Departmental Coordinator for Major Programmes and will assist any student in the planning of his/her programme

2494A/2495B Introduction to Political Inquiry. (ii) at least four advanced classes at the third and/or fourth year level, including the honours essay.

These requirements leave a minimum of two optional credits which may be at either the second, third or fourth-year level. The Department has designated these core class requirements in order to (1) explicitly introduce some notions of breadth into the honours programme, (2) provide all honours students a grounding in the normative questions of the discipline as well as the empirical bases for scholarly inquiry and (3) place before prospective honours students the several sub-fields offered in our Department around which individual programmes may be developed.

The honours essay is counted as one credit. It will be prepared during the fourth year under the supervision of a faculty member. The essay will be expected to show 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.

# **Combined Honours**

There are several combined honours programmes: 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 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 Programme in African Studies

The Department offers courses which may contribute towards a B.A. degree in African studies. Further details of this interdisciplinary programme are available in a calendar section above and from the coordinator of the programme in African 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 K.A. Heard is the over-all

Co-ordinator of Major Programmes and assisted by other Departmental members and as general advisors.

Selection: A student wishing to have a member the Political Science Department as un graduate advisor must be either: (a) enrolled first-year level class and contemplating a gramme in Political Science (in which case the visor will normally be the instructor of that n or (b) registered for a programme in Poli Science. Upon entering the programme a stur may indicate a choice of advisor. Normally the visor will be a faculty member teaching in the dent's sub-fields of concentration (if any) student's choice will be respected unless member chosen is unable to serve in this cana ty. For the student who has no preference whose choice cannot be honoured, the Dena ment's Undergraduate Studies Committee assign an advisor.

The advisory relationship may be ended by student or the advisor at any time and for a reason. One faculty member may continue to a vise the same student throughout his programm

Role of the Advisor: Basically, the advisor is tended to be available to the student through the year as a consultant on broad academic m ters. The advisor is not, however, a tutor w regard to specific classes. Students should c sult their advisers with regard to the gene structure of their programmes and any propos course changes.

# **Classes Offered**

Numbering System for Classes Class descriptions are listed by four-dis 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 indic year, or level, of class. Except for 1000-le classes, the second digit denotes the subwithin which the class is listed. Thus 3540B/5540B is a class open to third-year to and graduate students, in the sub-field Inte tional Politics and Foreign Policy, offered du the second term of the academic year.

No student may take more than one first level class but some second-year level classe quire no prerequisite. One of those which do may be taken in the first year in addition to all year level class.

The prerequisites listed with each class are tended to show the sort of preparation " structor anticipates. Admission to classes al

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above the third-year level is at the discretion of instructor who retains the right to judge the tability of each prospective student's qualificans for the successful completion of the class his contribution to it.

# 1. Introductory

# section 1, Introduction to Political Science, act.: 3 hrs.; J.H. Aitchison.

The core of this section of Political Science 100 be a comparative study of the institutions. rocesses and problems of government in western democracies. Attention will be paid mainbut not exclusively, to the political systems of creat Britain, Canada and the United States but with greater emphasis on Canada than will be the case in other sections of Political Science 1100.

The emphasis on Canada is for those who, at least initially, do not intend to take further classes in Political Science, and who wish to become more knowledgeable about the federal democracy of canada and its problems. The scope of the sections, however, will be sufficiently broad to provide a foundation for those who wish to proceed to higher level classes in Political Science.

# Section 2, Introduction to Political Science. lect, and discussion; 3 hrs.; R.L. Dial

There are a variety of ways we can acquire the beginnings of an understanding of politics. We can study, for example, the academic literature which seeks to describe and assess the workings of political systems. Another approach may be found in the careful dissection of political ideas, deducing from them a notion of how men should behave and do behave politically. Yet another alternative is to directly observe the political protess, particularly as it touches you, the individual. this section we shall pursue the latter approach.

handom observation, without a system of concepal expectations, is not likely to be a very fruitful rercise. Therefore, the first half of the course be spent absorbing a catalogue of concepts and propositions. Lectures will cover topics from itical culture to interest groups; from reaucratic authority to political compliance. le lecture material will be developed into a les of generalized propositions, applicable to political life of your immediate environment. ability to use these propositions in derstanding your political environment is the Mect of this course. The second half of the urse will see your time predominently spent in efield, observing various forms of political life the community; e.g., city councils, the Provin-Legislature, union meetings, hearings of

Section 3, Introduction to Political Science. lect. and discussion: 3 hrs.: K.A. Heard.

This class is intended to provide a general overview of some of the main aspects of political science, covering the fields of political ideas, comparative politics and, to a lesser degree, international politics.

Under political ideas, some of the major concepts of political philosophy will be examined; for example, the moral purpose (if any) of the state, authority, obligation, sovereignty and liberty. In this examination the ideas of some of the major political philosophers will be discussed; for example, Plato, Aristotle, Hobbes, Locke, Rousseau, Bentham, Mill and Marx,

Comparative politics covers the fields of political institutions and political behaviour, and our main case studies for the examination of these topics will be drawn from Great Britain, the United States and Canada, but with some reference as well to other types of political systems; for example, oneparty states and military regimes.

1).

Section 5, Introduction to International Politics and Foreign Policy, lect. and discussion: 3 hrs.; D.W. Stairs:

Intended for students who are especially interested in the play of politics at the international level, the material discussed in this class is divided into four main parts. The first, for background purposes, will be devoted to a general survey of international relations in the modern world with emphasis on the period since 1945. Among the topics to be considered are the founding of the United Nations, the evolution of the "cold war", the emergence of the so-called "third world", the origins and limitations of detente, the changing role of social, economic, and ecological issues as items on the international agenda, and a number of others. Following this preliminary material, the second part will be concerned with the meaning and significance of certain basic concepts which are commonly found in analytical discussions of

public commissions, etc. Through this period of field observations students will be required to keep a journal, systematically analysing events in the terms introduced earlier in the course.

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In the field of international politics the major focus will be on the United Nations, but other transnational organizations and associations will also be given some attention; for example, the Organization of African Unity and the Commonwealth of Nations.

Section 4. Introduction to Political Science, lect.: 3 hrs.; J.H. Aitchison (same as Section

international affairs. These will include, for example, the concepts of "power" and "power politics", the idea of the "national interest", and other such fundamental analytical tools.

The third part will be directed more immediately to the making of foreign policy and to the ingredients of statecraft. What is "foreign policy"? Who makes it? How do they operate? What influences - domestic and foreign - do they take into account? And what instruments and strategems do they deploy in the pursuit of their objectives?

In the final part the emphasis will shift away from the perspective of national actors and their foreign policy and will focus again on the international arena. A variety of interstate patterns of behaviour and relationships will be considered under such headings as alliance systems, balance of power systems, concert systems and collective security systems.

The class is designed to serve as a general survey for students who plan to take only one class in International Politics as well as a broad introduction for those who intend to take additional higher level classes. It will also be of interest to students who plan to take no other classes in political science.

# 2. Canadian Government Politics

2200 Canadian Government and Politics, lect.: 3 hrs.; Section 1 - S. Sutherland; Section 2 - P. Brown.

There will be two sections of this class. They will have the same central focus with other minor differences in content.

Among the major topics which may be considered are: Canada as a federal political community, Canada as an independent nationstate; representative government, political authority and political freedom; and, the structure and processes of parliamentary government. While considerable attention will be given to national politics, the provincial and municipal political arenas will be included in our examinations and discussions. The class will not be concerned exclusively with "government" but will encompass all aspects of politics including "non-governmental" groups and processes such as political parties, pressure groups, the mass media, political socialization, and political participation.

This class is open to students who have completed an introductory political science class or who obtain the approval of the instructor.

3204/5204 The Politics, Government and

# Constitution of Canada, seminar: 2 hrs Peter Aucoin.

This seminar course examines the principal characteristics of the political forces extant Canadian politics, the fundamental principles upon which the Canadian system of consta tional government is predicated and the main features of contemporary approaches to the governing of the Canadian political system cluded in this examination will be such topics as the political economy of Canada, the pluralisi character of the Canadian political community the exigencies of the federal system of Canadian government, the question of representative government in Canada, the role of political parties in Canadian government, and the organization of the governmental bureaucracy in Canada.

Prerequisite: P.S. 2200 and permission of the in. structor.

# 3208/5208 Canadian ' Provincial Politics lect. and seminar: 2 hrs.; D.H. Poel.

The course will bring together an emphasis on cross provincial, empirical research with an interest in the value context of provincial policy Primary course goals are (1) to stimulate enough interest in provincial politics for the student to develop a research question and (2) to provide the student with sufficient research skills to successfully complete a small project in comparative provincial politics. Throughout the course, whether discussing federal-provincial fiscal relations, political parties, the economy, or specific policy areas, we will attempt to maintain a provincial perspective.

# Prerequisite: P.S. 2200

3212/5212 The Politics and Government of Nova Scotia, seminar: 2 hrs.; J.M. Beck. (Not offered in the period covered by this edition of the calendar.)

Regional 3216/5216A Local and Government, seminar: 2 hrs.; staff.

This class will deal with the origins, development. and present legal and fiscal positions of various forms of local and regional government Canada. Special attention will be paid to three problem areas; the territorial extent of loca government, policy formulation in a fractionalized political system, and the unique dimensions of un ban government.

It is open to graduate and senior under-graduate students. Participants must have complete Political Science 2200 or an equivalent class I

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the Canadian political system.

# 3220A/5220A Intergovernmental Relations in Canada, seminar: 2 hrs.; P. Brown.

This class will consider a number of topics conreining the territorial division of political power and the relations that have developed between governments. Specific topics will include the ature of Canadian federalism, federal-provincial fiscal relations, selected functional areas of inlergovernmental relations, interprovincial relaions, and provincial-municipal relations.

undergraduates will be admitted only with the permission of the instructor.

prerequisite: P.S. 2200, or another class in Canadian Government.

# 3221B/5221B Case Studies in Intergovernmental Relations, seminar: 2 hrs.; D.M. Cameron.

Not offered in the period covered by this edition of the calendar.)

# 3224B/5224B Canadian Political Parties. lect, and discussion: 2 hrs.; D.H. Poel.

To what extent have various economic, neographic, regional, ethnic, religious, constitutional and social factors determined the character of Canadian parties and the party system? Do Canadian parties contribute towards genuine participatory democracy? What explanations can we offer for the rise of third parties within Canada? Are Canadian political parties in "decline" and do other means of interest articulation available in the Canadian system of government render parties redundant? These are some of the questions which will be addressed through readings, leclures and class discussion.

3228A/5228A The State and the Economy in Canada, seminar: 2 hrs.; staff.

The aim of this class is to explore the interaction between governments and economic organizaions, especially businesses, from the viewpoint of political science. Topics include the nature of government regulatory policies and problems related to multinational corporations. Others cen-<sup>re</sup> upon the role of government as a stimulus to economic activity, especially in the developmena and technological fields. Finally, discussion include some evaluation of the impact of declogies, deomocratic socialism for instance, pon businesses and the economy as a whole. e implications of these topics for Canadian society will be of prime concern.

Prerequisite: P.S. 2200 or permission of the in-

structor.

# 3250 Introduction to Public Administration, lect. and discussion: 3 hrs.: staff.

This class is designed to introduce students to the basic concepts of organization theory and administrative behaviour within the context of the operation of governments at the federal and provincial levels. Emphasis will be placed upon the relationship between theory and actual practices. An attempt will be made to give students a general overview of most of the behaviours and techniques they are likely to encounter in more. advanced classes or in administrative situations.

Prerequisites: P.S. 2200 or permission of instructor

# 4240/5240 The Policy Process in Canada, seminar: 2 hrs., P. Brown.

This will be a study of the fashion in which policies are evolved and applied in the Canadian political system. Various models of the policymaking process will be discussed and their applicability to the Canadian setting will be considered. The functions of all participants in the process will be examined but with particular attention being paid to the role of administrative structures.

Prerequisites: Political Science 2200 or 3250 or permission of the instructor.

# 4242B/5242B Science Policy in Canada, seminar: 2 hrs.; P.C. Aucoin. (Not offered in the period covered by this edition of the calendar.)

The purpose of this seminar is to examine the policies of Canadian governments for the delivery of health care. Existing policies and programmes will be studied in terms of the roles of the health professions and governmental structures in their formulation and administration. Special attention will be given to the process of intergovernmental relations in this policy field and the increasing politicization of health care delivery.

Prerequisite: Political Science 2200 or 3250 or equivalent classes in Canadian government and public policy.

4245B/5245B Urban Policy in Canada, seminar: 2 hrs.; D.M. Cameron. (Not offered in the period covered by this edition of the calendar.)

# 4243B/5243B Health Care Policy in Canada, seminar: 2 hrs.; P.C. Aucoin.

4254B/5254B Canadian Public Administration, seminar: 2 hrs.; A.P. Pross.

This class will examine 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 will be studied in detail.

Prereguisites: Political Science 2200 or 3250 or another class in Canadian Government.

4258B/5258B Provincial Government and Administration, seminar: 2 hrs.; A.P. Pross.

This class will consider the organization of government at the provincial level in Canada. Special attention will be given to those features of provincial government organization and public policy which have distinguished administration at this level from that of the federal government. Several recent reorganizations, including the proposal for Nova Scotia, will be examined in detail.

Prerequisites: P.S. 2200, 3250 or another class in Canadian Government.

4266A/5266A Natural Resource Administration in Canada, seminar: 2 hrs.; A.P. Pross.

This class will examine the formulation and administration of natural resource policies in Canada with special attention being given to renewable natural resources. It will focus particularly on such policies as they relate to Eastern Canada such as coastal zone administration and forest resources administration. A major emphasis will be placed upon the administration of these resources and the planning process at the local, provincial, and national levels of government.

Prerequisite: Political Science 2200 or 4240 or permission by the instructor.

# 3. Comparative Government and Politics

2300 Comparative Politics, lect. and discussion: 2 hrs., K.A. Heard.

Classes in comparative politics and the politics of foreign states are designed, at least in part, to provide students with a broad perspective on political behaviour and political institutions, and hence to complement programmes in Canadian politics and international relations, as well as to provide a valid programme in its own right.

This class is one that attempts to provide this broad perspective. While reference is made to Canadian politics, we go on to compare the situation in Canada with the situation in a sel number of other countries. These are chosen represent a broad range of cultures Australia, India, Nigeria, South Africa, Switzeria and the United Kingdom. The comparisons are made in terms of the various "environmented within which politics take place.

The environments selected for study are: the physical environment (size, climate, population etc.), the cultural environment (e.g., linguisti and/or ethnic diversity or homogeneity, socialize tion, etc.) the constitutional environment (typesn constitution, effectiveness or ineffectiveness constitutional structures), the economic environment ment (the role of the state on the economy, the relation between economic development and political development, effects of unequal distribution tion of economic resources, etc.), the institutional environment, with respect to informal political in stitutions (parties, interest groups, the press, etc. and the external environment or external in fluences on policy choices (e.g. foreign alliances dependence, multinational corporations, etc.).

With respect to each of these major topics, first some observations will be made concerning the general significance of the "environment" con cerned, then reference will be made to the Cana dian situation, and thirdly some comparation material will be brought to bear on the subject. order to provide a "mix" in terms of level of development, size, geographical location, etc material for the comparative analysis will be main ly drawn from a few case studies: the United Kingdom, Switzerland, India, Australia, Sout Africa, Tanzania and Nigeria. None of these cour tries, however, will be studied comprehensively a in detail.

Prerequisites: P.S. 1100

2305 European Comparative Politics, lect. and discussion: 2 hrs.; R. Boardman.

(Not offered in the period covered by this edition of the calendar.)

2320 Political Behaviour: Micro- and MacroAnalysis, lect. and discussion: 2 hrs. D.H. Poel.

(Not offered in the period covered by this edition of the calendar.)

2321B Political Behaviour, lect. and discus sion: 2 hrs.; S. Sutherland.

The concern of this class is with how individu gather information about, form general orien tions toward, and learn to participate (or no participate) in the polity. Areas of concentral will be political socialization, the question of the

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relevance of personality traits to political opirelevation and activity stances, and political parripation. Research methods utilized within hese areas of study will necessarily be an imporant secondary consideration.

2325 The Theory and Practice of Government in the United States, lect. and discussion: 3 hrs.; J.H. Aitchison.

the first theme will be the theory of American government, discussion of which will be based mainly on the first ten chapters of Dahl. nemocracy in the United States. The Federal udiciary, Congress and the Presidency will then he examined in that order. In that order because a) the political process is judicialized in the inited States to a far greater extent than in any other democracy, so much so that the powers and functioning of other political institutions can be more readily comprehended if the role and functioning of the Federal Judiciary are first understood and (b) Congress was intended to be the senior of the two "political" branches. Other memes will be political parties, pressure groups, nominations and elections, federal-regional finandal relations, state and local governments, and me Supreme Court and constitutional limitations. The last of these will be taken up at the expense. inecessary, of one or more of the others.

Principal Texts: R.A. Dahl, Democracy in the united States: Promise and Performance; D.R. Mayhew, Congress: The Electoral Connection: M.D. Reagan, The New Federalism.

# 2330 Politics Through Literature

his course pursues the questions: "Can we nderstand politics through literature?" and "To nat extent are the views of the political process d political values fashioned by writers of fiction nore or less useful, complementary, or different om those found in empirical or formal Mosophical studies?" Lectures and readings be focused on the two dimensions of trature and politics - fiction as a form of lical analysis and fiction as a political instruent. Various forms of literature will be covered, ouding novels, short stories and drama. adings may include works of Orwell, Malraux, gh, Dickens, Adams, Hugo, Steinbeck, Lewis, lestler and others. The course has no prereites and is not restricted to political science

18/5301B Comparative Analysis, sem-2 hrs.; staff.

offered in the period covered by this edition ecalendar.)

<sup>45</sup>A African Politics, seminar: 2 hrs.; T.M.

# Shaw.

As one of the Department's offerings in advanced comparative politics, this class analyses the political economy of several black African states. It focuses on the elusiveness of independence and development and examines the variety of responses to the problems of dependence and underdevelopment. Although it concentrates on the countries of eastern Africa - especially its investigation of several characteristic African phenomena - one-party states and military regimes, African socialism and self-reliance, political participation and exclusion, the growth of inequalities and authoritarianism - constitutes a general introduction to African government.

This class is intended for students in African Studies and Political Science and can be matched with Political Science 3540B on the Foreign Policies of African States.

3345B/5345B South Africa: The Dynamics of Political Groups and Group Domination, seminar: 2 hrs.; K.A. Heard.

What accounts for continued Afrikaner political domination in South Africa? Why do Englishspeaking South Africans apparently play such a passive role? Why have the Blacks in South Africa not mounted a revolutionary movement? What are the prospects for "homelands" independence?

These are the types of questions that will be explored in this class, with the object not only of acquiring an understanding of South African politics but with that also of formulating hypotheses concerning the formation, persistence and behaviour of political groups.

This class is intended for students who are interested either in comparative politics, in African studies or, generally, in political behaviour. It can also be used to match Political Science 3315A.

3357A/5357A Chinese Politics: Domestic, seminar: 2 hrs.; R.L. Dial.

This course will deal with the various dimensions of the Chinese political process since 1949. The central issues covered in the lectures and readings are the development and maintenance of a modernizing state, the continuing struggle for political integration, and the attempts to fashion a state philosophy consistent with these undercurrents.

This course may be usefully matched with P.S. 3574B/5574B, Chinese Foreign Relations.

# 4. Political Theory and Methodology

2400 Justice, Law and Morality, seminar: 2 hrs.; D. Braybrooke. (Same as Phil. 240.)

This class, for which there is no prerequisite, serves as an introduction to the history of political philosophy; and also (allowing for the emphasis on political applications) to philosophical ethics. It is, however, designed to be a self-sufficient class, with an argument (a "plot") of its own. In the first term, the classical view of justice formulated by Plato in The Republic and reflected in St. Thomas's doctrine of natural law confronts the savage realism of Hobbes's Leviathan. As the class will learn by pursuing the subject through the writings of Locke, Hume, Bentham, Mill, and Marx, the concept of justice has had a mixed career since Hobbes' time. It has often had only a limited and subordinate role; sometimes it has appeared redundant, even when firm foundations for choosing social institutions have been claimed. In our own time, a major effort has been made by John Rawls to restore justice to a central place in ethics. The class will wind up the second term considering his theory, after examining a general view (by Stephen Toulmin) of the current state of ethics, and a contemporary account (by Lon Fuller) of the extent to which law must be moral to be genuine.

2405 Political Philosophy from the Stoics to the End of the Fifteenth Century, lect. and discussion: 3 hrs.; J.H. Aitchison.

(Not offered in the period covered by this edition of the calendar.)

2494A Introduction to Political Inquiry: Understanding Statistical Information, lect. and discussion: 2 hrs.; S. Sutherland.

Members of this class will engage in study planned to improve the ability to understand quantitative information. The class will begin with a consideration of the problems inherent in conceptualizing and operationalizing social indicators quantitative information about socially important conditions of society - and will proceed through the elementary techniques most often used to present such information. Thus, concentration will be upon the notion of "norming", sampling and statistical inference, common descriptive statistics through correlation. The aim is to learn where each statistics or technique of analysis is appropriate, rather than to gain proficiency in calculation. There is no prerequisite for this course.

2495B Introduction to Political Inquiry: Understanding Political Man, lect. and discussion: 2 hrs.; R. Eden.

To complement the inquiries undertaken in p. 2494A, this class will focus on some of the non and nastier activities of political men, include the formation of parties in electoral legislative bodies; the founding of political stitutions; the leading of mobs; and other uses force and fraud for political ends. In taking these topics the concern will be to introd modes of analysis which reasonable men ha adopted in order to penetrate the deception practiced or perpetrated by men of action a class will consider how, and why, it is that in pursuit of knowledge political science has alway confronted philosophical difficulties distinguishing knowledge of political matter from mere opinion. We shall introduce some the ways of thinking that have been proposed in resolve these substantial difficulties.

The class is open to students who have com pleted an introductory political science class who obtain the approval of the instructor.

3410/5410 Man, Society and Politics: the Concept of Community, seminar: 3 hrs.; staff

(Not offered in the period covered by this edition of the calendar.)

3420/5420 The Political Thought of the Six teenth and Seventeenth Centuries, lect, and seminar: 2 hrs.; J.H. Aitchison.

(Not offered in the period covered by this editor of the calendar.)

3421A/5421A The Political Philosophy of Hobbes and Locke, lect. and seminar. 2 hrs.; J.H. Aitchison.

(Not offered in the period covered by this editor of the calendar.)

3422B/5422B The Political Philosophy Rousseau and Hume, lect. and seminar.2 hrs.; J.H. Aitchison.

(Not offered in the period covered by this edited of the calendar.)

3430C/5430C The Political Philosophy Plato, seminar: 2 hrs.; R. Eden.

(Not offered in the period covered by this ed of the calendar.)

3450A/5450A Theories of Federalis seminar: 2 hrs.; staff.

(Not offered in the period covered by this edu of the calendar).

3451B/5451B The Critique of Democracy

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Nodern Political Philosophy, lect. and eminar: 3 hrs.; R. Eden.

this course is intended as an introduction for tizens who wish to reflect critically on the character of representative government, on liberal democracy, and on the kind of commercial denublic in which we live in North America.

A course seems necessary because there is con-Noversy concerning what gives liberal society its coherence and definitions; indeed, concerning whether it has a definite form. In the hope of putthese controversies into perspective, we shall return to Montesquieu, one of the early proents of liberal commercial republicanism, and Nietzsche, who may be the most intransigent and radical opponent of liberal democracy and representative institutions.

To put it simply, we shall ask Montesquieu, who sought to father this creature, why it was necessary, or reasonable, to create it. We shall ask Nietzsche, who set out to destroy it, why he hought it worthwhile to bury Montesquieu's commercial republic. By asking these questions persistently, we may articulate the coherence, and define the character, of liberal democracy, as seen by a most thoughtful friend and by a most brilliant antagonist.

moursuing this line of inquiry, the seminar will also introduce the student to a charming and seductive form of imaginative literature. Both Montesquieu and Nietzsche wrote aphoristically. Their modes of writing are persuasive and appeal to the sentiments, to prejudice, and to the imagination, as well as to reason. We shall attempt to subject their writings to critical analysis and to make them available for rational evaluation.

We shall assume that the student is coming to with authors, to the problem of liberal democracy, and to this seductive mode of argumentation or Persuasion, for the first time. The course does not resuppose sophistication, and indeed it hopes <sup>oprepare</sup> the reflective student to be judiciously atical of those, like Montesquieu and Nietzsche, the are intent upon sophisticating us.

455A/5455B Marxist Theory and Its Upshot the Modern World, seminar: 2 hrs.; D. "aybrooke. (Same as Phil. 355A/555A.)

al objectives inherited from earlier socialist kers inspired Karl Marx's life work and opht. The distinctive features of Marxist alism, however, come from the combination losophical ideas derived (with a number of ges) from the German philosopher Hegel ideas about economics derived from <sup>nomists</sup> of the British classical school. The

munist Party.

Prerequisites: A class in philosophy or a class in political science.

3470B/5470B Futurology and Politics, seminar: 2 hrs.; D. Munton. (Not offered in the period covered by this edition of the calendar.)

A knowledge of the promises and pitfalls of social science research is as important today to the average citizen as it is to the administrator or researcher. This seminar is intended to be 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 theory, research design, data collection (surveys, simulation, aggregate date, etc.), measurement, and analysis are explored using substantive readings from various subfields of the discipline.

The major assignment in the course will be a research project of the student's own choice and design. It is not expected that students will have any background in statistics or computer programming, but it is hoped that all are or can become excited by the joys of disciplined discovery.

3496C/5496C Philosophy of the Social Sciences, seminar: 2 hrs.; meeting every two weeks throughout the year; D. Braybrooke, S. Sutherland. (Same as Phil. 351C/551C.)

A number of philosophers (among them Peter Winch, Charles Taylor, G.H. von Wright) have challenged the application in the social sciences and history of the methods, quantitative and otherwise, used in the natural sciences (explicated in the works of Karl Popper, C.G. Hempel, Wesley Salmon, and others). The challengers hold

day - of the social arrangements typical of capitalism. The depth of the critique and its uncompromising character can, however, be explained only by referring to the ideas (about alienation; about fully rational social institutions) taken from Hegel. After identifying in this way the chief ingredients of Marx's teaching, the class will consider various attempts (by Bernstein; Sorel; Lenin; Trotsky) to accommodate Marxist theory to economic and political developments that Marx himself did not anticipate. At the end of the term, it will discuss the official creed of the Soviet Union; and a representative expression of contemporary Western Marxism outside the Com-

# 3495/5495 Research Methods and Data Analysis, seminar: 2 hrs.; D.J. Munton.

that in the study of man and society, different methods, occupied with the logic of action rather than with causality and leading to interpretative (or "hermeneutical") explanations, are suitable. This class will try to establish the extent to which this view rightly calls attention to an important non-quantitative branch of social inquiry, most vividly illustrated in anthropological studies of whole cultures. The class will also try to work out the relationship between this branch and the branch or branches of social inquiry in which the example of the natural sciences can be fruitfully followed. In particular, it will discuss the degree to which rules (the standby of the interpretative branch) complement regularities (the standby of the other branch or branches), even fuse with them. The class will also give particular attention to the use - on either side of the divide between the branches, or bridging between them - of the assumption that agents are rational. The application to the social sciences of Thomas Kuhn's concept of paradigm will be kept in mind throughout these stages of discussion. At the end of the year, attention will turn to the contention of such philosophers as Juergen Habermas and Karl-Otto Apel that the social sciences have, besides the tasks of the branches mentioned, a task of criticism ("Ideologiekritik"); and the class will consider how this task might be accomplished.

Prerequisites: A class in research methods or political behaviour and a class in philosophy; or permission of the instructors.

# 4435A/5435A Machiavelli and Modern Politics, seminar: 3 hrs.; R. Eden.

How modern is Machiavelli? How Machiavellian is modernity? This seminar will explore Machiavelli's contribution to modern politics and political science through a study of his two principal works, The Prince and The Discourses.

# 4438B/5438B Rousseau and the Founding of Modern Democracy, seminar: 2 hrs.; R. Eden.

To many it seems self-evident that the progress of the arts (or technology) and the sciences' is necessary for human happiness and hence for the political order which best promotes human happiness — that is, democracy. This belief is widely shared, and indeed it is difficult to imagine how most of our institutions could exist if it were not widely shared. But it may be questioned: although modern science may be true, it has been a powerful tool in the hands of tyrannical regimes. Rousseau was the first political philosopher to question modern progress based upon the sciences and the arts and to reject that progress on behalf of democracy and human happiness.

This seminar will explore the origins of modern

democracy through a study of Rousseau's political philosophy. Considerable attention be given to Rousseau's defense of democracy against earlier critics, and to his understanding of the founding of a democracy. Our primary study will be Rousseau's chief writings on politics which we will examine in depth.

4479A/5479A Utilitarianism, Classical Lib eralism, and Democracy(Seminar Philosophy, Politics and Economics), 2 hrs. first term, D. Braybrooke.

# (Same as Phil. 447A/547A and Econ. 446A/547A)

This class will be preoccupied with the impact on political philosophy of two leading beliefs characteristic of classical liberalism: 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 com mon good, beyond personal preferences and points on which the preferences of different persons agree. These beliefs have been most sharply formulated by economists. The class will trace the first belief from Adam Smith through John Stuart Mill to Milton Friedman; then examine the history of the second belief, which turns on Pareto's repudiation of classical utility (as conceived by Benthan and Mill) and culminates in Buchanan and Tullock's Calculus and Consent The class will then given some attention to less restrictive conceptions of democratic govern ment that have grown up alongside classical liberalism. It will read such authors as R.H. Tawney and Robert A. Dahl in the course of doing so. Finally, it will consider the implications for liberalism of certain findings, in the theory of public goods and the theory of games, about the limits of voluntary action.

Prerequisites: Students taking the course should ideally have had previous courses in all three subjects, but it will suffice for them to have worked to an advanced undergraduate level in at least one of them. Students taking the course for a credit in philosophy should have had a class in logic (20. or 201 or 202) and one in ethics (310); students tak ing the class for a credit in political science should have had at least one 3000-level class in political science; students taking the class 10 credit in economics should have had at least one 330-level class in that subject.

4480A/5480A Social Choice Theory (Sem inar in Philosophy, Politics and Economics 2 hrs.; first term, D. Braybrooke.

(Same as Phil. 448A/548A and Econ. 448A/548A (This class will not be given during the year rel red to by this calendar; it will be given the follow ing year.)

# political science

Kenneth Arrow's Nobel Prize winning theorem, to Kennetict that no device of social choice meets mapparently minimal set of weak standards, has mappared to lead two traditions of thought to ruin. tradition, begun in the 18th century by Conat and continued in the 19th by Lewis Carroll, he theory of voting. The other tradition is is the economics — the theory of economic mmendations - which has had a drastically hibited history since Pareto led economists to hondon the notion of interpersonally measurable utility. Its inhibitions, which are reflected in Arwork, have not saved it from his attack. This class, after tracing the two traditions that conrerge in Arrow's theorem, will study the theorem real and then consider (with the help of such writers as A.K. Sen and Charles R. Plott) the continuing disarray into which formal social hoice theory (and hence the basic theory of democracy) has been thrown by the theorem.

prerequisites: Students taking the class should deally have had previous classes in all three suberts, but it will suffice for them to have worked to anadvanced undergraduate level in at least one of mem. Students taking the class for a credit in hilosophy should have had a class in logic (200 r 201 or 202) and one in ethics (310); students takng the class for a credit in political science should have had at least one 3000-level class in mitical science; students taking the class for redit in economics should have had at least one 100-level class in that subject.

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.)

This class will not be offered during the academic year referred to by this calendar.)

495B/5495B Problems of Quantification, seminar: 2 hrs.; S. Sutherland.

ere will be two areas of concentration. Atten-<sup>on</sup> will be given to the theoretical foundations of <sup>acial</sup> enquiry, with concentration where possible social indicators. Second, students will gage in computer analysis of a small data set, gain some facility in interpreting statistics. A or paper will emerge from student's work in her of the two streams.

<sup>4</sup> International Politics and Foreign Policy

World Politics , lect.: 2 hrs.; T.M. Shaw.

<sup>analysing</sup> the development and future of inter-

national politics this class will consider both theories of international relations and the variety of actors in the international system. It will attempt to explain dependence and interdependence, conflict and harmony, and trends in the evolution of world politics. It will focus on problems of world order, especially on those of inequality and under-development, balance of power and arms races, regional conflict and cooperation, and the impact of international law and organizations. Although the class will examine the evolution of the international system, it will concentrate on contemporary problems such as international stratification, ecology, integration, detente, resources and middle powers.

This class is designed as a general survey of Canadian foreign and defence policies and of the processes by which these policies are made. After some preliminary discussion of the history of Canadian external relations before World War II, including in particular the drive for independence in the conduct of foreign policy, the first part of the syllabus will be concerned with the substance of Canada's role in world affairs since 1945. The second part will be devoted to an analysis of the "policy machine" and will deal with such subjects as the growth and development of the Department of External Affairs, the evolution of the Canadian foreign service, the current structure of the foreign policy community, and the relationship between the foreign service bureaucracy and such political institutions as the Cabinet, Parliament, the various provincial governments, political parties, and pressure groups. Throughout, an attempt will be made to identify some of the persistent pressures and constraints which Canadian policy makers are forced to take into account as they respond to the demands of their constituents and to the changing conditions of international politics.

# M.K. MccGwire.

(Not offered in the period covered by this edition. of the calendar.)

# seminar: 2 hrs.; staff.

The international system has changed dramatically in the present decade; this course is intended to describe, analyse and explain progress twards, and the elusiveness of, a new world order. It will focus on the demands for, and responses to, change in international politics, economics, society and norms. In addition to a critical review

2510 Canadian External Relations, lect, and discussion: 2 hrs.; D.W. Stairs.

3530/5530 The United Nations in World Politics, seminar: 2 hrs.; R. Boardman and

3535A/5535A Towards a New World Order,

of the burgeoning literature on the new world order, the course will examine the impact of several salient issues, especially uneven development, energy and raw materials, food and population, new actors and coalitions, corporations and technological transfer, pollution and the global environment and coercive or incremental change. The course will consider normative as well as analytic problems and will concentrate on the tensions between inter-dependence and dependence, self-reliance and integration, autonomy and transnational imperatives; it is a response to a world of inequalities, scarcities and tensions.

This is an advanced course in international politics which requires a concern with, and awareness of, global issues; it should be of interest to students of international economics, society and history or with a familiarity with Third World states and problems.

# 3540B/5540B Foreign Policies of African States, lect. and seminar: 2 hrs.; T.M. Shaw.

The foreign policies of several African states will be reviewed in this class. It will begin with a survey of Africa's inherited problems and ideological responses and an examination of the four levels of international interaction in Africa: its dependence and impact as an international subsystem, the development of an African continental system, patterns of regional conflict and cooperation, and the making of foreign policy in African states. Since new states have produced novel discontinuities in the international system we will be concerned with the diplomatic, developmental, and methodological implications of African participation. The second half of the course will be taken up with case studies of African foreign policies, e.g., those of Tanzania, Ghana and Nigeria, Egypt and Libya, Ivory Coast and Senegal, Malawi and Zambia, and Uganda and Kenva: and of regional organizations in Africa such as the East African Community, the Entente, and ECOWAS.

Students concentrating in International Politics or in African Politics will find that this class fits into their programmes.

3544B/5544B Conflict and Cooperation in Southern Africa, lect. and seminar: 2 hrs.; T.M. Shaw.

(Not offered in the period covered by this edition of the calendar.)

3570/5570 Canadian Foreign Policy, seminar: 2 hrs.; D.W. Stairs and D.J. Munton.

This seminar focuses on the recent history and

contemporary problems of Canadian foreign policy. The first part of the class analyses main developments and situations in Canada's pos war relations. These historical developments clude the framing of the United Nations, Canadia initiatives in the establishment of NATO, Par ticipation in the Korean War, the Suez Crisis and Canada's UNEF proposal, the nuclear weapons question, relations with Quebec and France recognition of China, Nixon-economics and continental inter-dependence.

The second part of the class takes a more analytical approach to the factors that underline Canadian policy. Using the historical cases as it lustration, the seminar will consider the influence of external factors (for example, the Cold War, the hierarchical nature of the international system and the policies of other countries) and domestic factors (public opinion, interest groups, Parlia ment, the federal bureaucracies, leaders' per sonalities, etc.)

Finally, some policy prescriptive questions will be considered: Is nonalignment appropriate or possible? What should Canada do about American economic domination? Should Canada become a major "foreign aid power"? And so on.

# 3572/5572 American Foreign Policy, seminar: 2 hrs.; G. Winham.

The course will explore why Americans make the kind of foreign policy they do and will examine. the nature of the people; the nature of American foreign policy institutions; relationships among institutions and between institutions and the public: and perceptions of and pressures from the external environment. The course will focus on the decision process, and relevant methodologies for examining decision strategy will be examined. Students will be expected to develop an ability to explain foreign policy decisions of the United States.

The course will be conducted as a seminar with regular readings, discussions, and class reports of ancillary readings. One research paper for the year is expected, which will be presented orally in class. A short version of the paper will be submitted during the first term. A short essay is ex pected near the end of the year.

3574B/5574B Chinese Foreign Relations. seminar: 2 hrs.; R.L. Dial.

China's international behaviour and the polici process shaping that behaviour will be explored through the proposition: "A nation's foreign policy is a device for maximizing externa sovereignty and controlling internal interests will external consequences." Approximately one

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quarter of the lectures will deal with the foreign quarter of "traditional" China, as they may prorelations a sense of contrast and continuity with ontemporary Chinese international behaviour. content benaviour. or this course.

3590/5590 The Politics of the Sea, seminar: 2 hrs.; M.K. MccGwire.

Not offered in the period covered by this edition of the calendar.)

1595A/5595A Theories of War and Peace, seminar: 2 hrs.; D.J. Munton. (Not offered in he period covered by this edition of the calendar.)

4520/5520 Conceptual Development in the study of International Politics, lect. and discussion: 2 hrs.; G. Winham.

this course is a survey of the theoretical literature International politics and foreign policy. It seeks in understand three timeless problems in internaional relations: the nature of conflict and war; the nature of economic disparities and imperialism; and the nature of social grouping and nationstates. The course is a study of politics, but it draws on research from history and the social sciences. For example, students will be expected to read from Toynbee and Thucydides as well as Deutsch, Singer and McClelland (The Achieving Society).

This course is designed mainly for graduate students, but it will be open to undergraduates who feel they are prepared to accept heavy assignments at an advanced level. Students will be expected to participate regularly in seminar and to present a major paper during the term.

# 4600 Honours Essay

4625 Reading Class: Advanced American Government, J.H. Aitchison.

# psychology

# Psychology

Professors J.C. Fentress (Chairman) G.V. Goddard W.K. Honig P.H.R. James J.A. McNulty S. Nakajima D.M. Regan K.E. Renner R.S. Rodger

Izaak Walton Killam Research Professor M. Yoon

# **Associate Professors**

J.W. Clark P.J. Dunham B. Earhard M. Earhard V. LoLordo D.E. Mitchell B.R. Moore R.L. Rudolph

# **Assistant Professors** C. Adamec J. Barresi K. Bloom

- M. Cynader P. Jusczyk
- R. Klein I. Meinertzhagen

- K. Beverley F. Harrington M. Mastari
- **B.** Timney
- M. Woolridge

B. Rusak

People see and hear, get hungry and fall asleep. and for an instant remember in great detail events which have just happened to them. Sometimes they hear but do not listen; often they remember only a fraction of what happened five minutes previously. They make love and play dangerous games, solve problems and go mad, drink far more than they need to quench their thirst; and they fight. Animals behave in similar ways. If we knew the reasons why they did so, we would have gone a long way towards understanding ourselves. Just as important, differences between species must be recognized to appreciate the unique features of each, and to provide a solid basis for rigorous and often limited generalizations.

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 pro-



# **Research Associates and Postdoctoral Fellows**

duce, 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. Although it has been the major achievement. of behavioural science in the past two or three decades to discover the remarkable precision with which the behaviour of animals and men is controlled by their internal and external environments, -- and as a student you will be expected to master the technology which has made these discoveries possible -- this achievement has increased, not diminished, the challenge. We know for certain that there are at least two memory systems in the brains of vertebrates, but we do not know how these systems are linked together; we know (contrary to common sense) that things look larger the further away they seem to be, but no one understands why the moon on the horizon looks larger and closer than it does in the sky; it has become clear that both genes and environment set the potentialities and constraints for behavioural expression -- that nature can never be fully separated from nurture; there is reason to believe that at least some of the mental diseases are not diseases at all, but forms of behaviour which are learned like habits -- yet we do not understand why, some people learn these disordered behaviours while others escape scot-free.

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 on the one hand 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

## General B.A. or BSc. in Psychology.

Students enrolled in the general (i.e., three-year) programmes 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 import for the prospective major to plan ahead caret If you need advice planning your programme Dr. J. Clark, Dr. R. Klein, Dr. P. Jusczyk, or D. Rudolph.

# Requirements for a general degree in Psycholog

- 1. Psychology 100 or Psychology 101.
- 2. Psychology 200A
- 3. At least three more classes from the following 201, 207, 208, 209, 210, 213, 214, 215, 216
- 4. At least one full credit at the 300 la (excluding 300 and 301).
- 5. At least one more full credit in Psychology

# B.A. or B.Sc. with Honours in Psychology (Main Programme).

Students enrolled in the major honours pr gramme must take at least nine and no more the eleven full credits beyond the introductory level their area of concentration. Requirements for the Honours Degree in Psychology are listed below

It is recommended that students in this pregramme take 200A and 210B and as many classer from the core programme (see requirement below) as possible in the second year. Honour students are advised to complete Psychology 35 m Introduction to Psychology, lect.: 3 hrs.; prior to the fourth year. 400 level seminars maybe taken in the third and fourth years. 200 or 300 leve classes may be taken at any time provided the the student meets the necessary prerequisites.

Although there is considerable flexibility for the student, it is important to plan carefully (this especially true for those considering graduate work in Psychology). If you need advice in plan ning your programme, see Dr. P. Dunham, Dr. R. Klein, Dr. P. Jusczyk, or Dr. R. Rudolph.

# Requirements for an Honours Degree **Psychology:**

- 1. Psychology 100 or Psychology 101.
- 2. Psychology 200A and Psychology 210B.
- 3. At least four classes from the following: 201 207, 208, 209, 213, 214, 215, 216.
- 4. Psychology 357.
- 5. At least two full credit laboratory classes at 1 300 level (Psychology 300 may substitute one of these classes).
- 6. Psychology 465 (Honours Thesis).
- 7. At least one full credit of 400 level seminars.
- 8. At least one more full credit of Psychology<sup>a</sup> or beyond the 300 level.

## **Combined Honours**

It is possible for students to take an honout degree combining psychology with a related and or science subject. In such a combined honou programme the student must take eleven credits beyond the 100-level in his two areas specialization, with not more than seven credits in either area. The student in the combin

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honours, programme will normally write a d not the equivalent) in the area that he elects his major and in which he takes the majority of lasses. Any student intending to take a comhonours degree should consult with the respective departments to arrange the details his programme.

# Other Programmes

variety of other programmes are available in coperation with other departments. These pronammes are designed to meet the needs of udents whose specific interests may lie in areas than those covered by the major and nours programmes offered by the department. interested students should contact Dr. R. Klein further information.

# unior Research Assistantships

number of Junior Research Assistantships will available, during both the academic term and he summer vacation, to students who are taking honours degree in psychology. Details of these sistantships, and of the stipends attached to hem may be obtained from Dr. B. Earhard.

his class is designed for students who are inarested in the biological and social bases of phaviour in both men and animals. You may exect to complete the class with an understanding how the senses work and of how, for instance, elearn to see; of the different kinds of memory man, how they operate, and how they are afcted by disorders of the brain; of the way in hich hereditary and environmental factors inflock to produce those complex sequences of chaviour which distinguish one species from nother; of the way in which children learn their language; of how the form of an animal ciety can be predicted from a knowledge of a ited number of ecological facts.

chology 100 meets three hours a week for lecs. The grade is based on a number of examinais given at intervals throughout the year.

Introduction to Psychology, tutorials: 3 Staff.

content of Psychology 101 is similar to that of chology 100. The two classes differ in the ner of teaching. In Psychology 101 there is no pace for covering the content of the class. are there regularly scheduled lectures -ough lectures, films and demonstrations are sporadically. Instead, students work <sup>ugh</sup> the readings at their own pace, and, when think that they have mastered a unit of the <sup>din</sup>gs, 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 additiona' 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.

# 200A Methods in Experimental Psychology, lect.: 2 hrs.; lab.: 2 hrs.; P. Dunham and other members of the department.

The basic purpose of this class is to introduce the student to the methodological tools which have been developed by research psychologists to study behaviour. The course has both lecture and laboratory requirements. In lecture, we will 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 will consist of a series of projects designed to illustrate some of the more important techniques used by psychologists in the study of human and various other animals.

# Renner.

The goal of this class is to acquaint students with different approaches taken in the field of clinical psychology, both theoretical and applied. 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," "abnormal" behaviour. The class provides a broad overview of intervention programmes ("therapies") from Freudian analysis to more contemporary behavioural and phenomenological approaches ot the modification of behaviours and beliefs.

Prerequisite: Psychology 100 or Psychology 101.

rently with Psychology 312.

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 will vary according to current issues but may include pornography,

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Prerequisite: Psychology 100 or Psychology 101.

201A Clinical Psychology, lect.: 2 hrs.; discussion groups: 1 hr.; C. Adamec, K.E.

Restriction: This class may not be taken concur-

202B Psychological Aspects of Social Issues, lect.: 3 hrs.; K.E. Renner, C. Adamec.

drugs, religion, abortion, law and order, and similar topics. Selected topics will be examined in greater detail to provide a context for formulating general psychological concepts and theoretical issues. The final part of the course will pursue the logical implications of the analysis for prescriptions for the future.

Prerequisite: Psychology 100 or Psychology 101.

# 203 Psychological Measurement, lect.: 3 hrs., R.S. Rodger.

After some of the abstract properties of measurement systems are described (e.g., representation theorems, uniqueness theorems, meaningfulness, admissible scale transformations, scale types, fundamental and derived measurement), aspects of psychophysical measurement will be discussed. Further elaboration of measurement procedures in Psychology requires a knowledge of statistical theory. The required amount of this theory is given and then used in the context of signal detection theory and the analysis of data from paired comparison experiments. The course ends with consideration of mental test technology (especially with cognitive tests of the multiple choice type), including item analysis, reliability and validity. Class notes have been prepared by the instructor. Exercises are scheduled regularly for students to do out of class. A knowledge of higher mathematics is not necessary to understand the material in this course: a knowledge of high school arithmetic and algebra is generally a sufficient background.

Prerequisite: Psychology 100 or Psychology 101.

205A Integration of Behaviour, lect.: 3 hrs., J.C. Fentress

(Not offered in the period covered by this calendar.)

The concern of this course is how various dimensions of behaviour are combined into adaptive functional sequences. Material is drawn from a variety of animal species, including man. Reference to underlying nervous system mechanisms is used to clarify the dynamic relationships of diverse organisms to their environments. Topics include description and classification of sequential structure, balance between central programming and sensory processing, control system specificity, the problem of feedback, and genetic plus experiential substrates of integrated patterns of behaviour.

207 Introduction to Neurosciences, lect.: 3 hrs.: I.A. Meinertzhagen

This class invites all students who are interested

in the structure and functions of the brain; are they, how do they work and how do they ar Neurosciences is a newly evolving disciplinary field. Its aim is to integrate exer new findings in many diverse areas of research into a single systematic framework class will introduce to the student five aspects in this effort: (1) Structural organiza of the nervous system; central, peripheral autonomic nervous systems and compara studies amongst different vertebrate and vertebrate species. (2) The basic unit of the vous system; the neurone and its cytology. (3) principal language of the nervous system; ne impulses and neural signalling. Excitation conduction along the axon and transmiss across synapses. (4) Embryonic development the nervous system; growth, degeneration regeneration. (5) Specificity and plasticity of nervous system; from fixed patterns of organize tion and connections to the problem of experies tial modification, learning and memory.

Prerequisite: Psychology 100 or Psychol 101 or with consent of the instructor those not having Psychology 100 Psychology 101, Biology 1000 and 2 would be advantageous.

# 208B Social Psychology, lect.: 3 hrs.: Barresi.

This class will provide a general introduction b the field of social psychology. This class takes in terpersonal relationships -- i.e., how a person is in fluenced by the implied or actual presence d other persons -- as the frame of reference. Social context plays an important role in defining a per son as well as providing roles and models. It operation of social processes is considered w respect to substantive topics (e.g., prejudice. titudes, conformity) selected from the current research literature. Various theoretical perspen tives which have been proposed for the integra tion and organization of the subject matter are troduced.

Prerequisite: Psychology 100 or Psychology 10

# 209A Developmental Psychology, lect. hrs.; P. Jusczyk.

This class focusses on the origins and su quent growth and development of psycholog processes. What kinds of adaptations does growing organism have for coping with his vironment? How does experience affect course of development? Is there evidence distinct stages in the development of psy logical processes or does change occur throu series of gradual increments? A number of tempts by important theorists to describe and

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plain the developmental process are reviewed. while the chief emphasis of the class is on human development, examples and parallels will also be drawn from research with other organisms.

prerequisite: Psychology 100 or Psychology 101.

# 210B Contemporary Research Problems in Psychology, lab.: 3 hrs.; P. Dunham.

This class is intended primarily for honours students as a continuation of Psychology 200A. 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 is expected to have completed an independent experiment and submitted a written report of the data. Students other than honours students will be permitted to take the class with the permission of the instructor.

prerequisite: Psychology 100 or Psychology 101 and Psychology 200A.

# 213B Information Processing, lect.: 3 hrs.; R. Klein

Many psychologists have adopted the language and concepts of computer science to help them understand human cognitive processes: perception, memory, thinking, action. Computers receive, process, store, retrieve and produce information. This class will introduce you to the view that the mind of man, like the computer, is an information processing device. Although we begin with an analogy between brains and computers, we quickly move into the area of psychological research, because most of what we know about human information processing we have learned through laboratory studies of humans performing carefully designed tasks.

is there more than one kind of memory? How do we remember and why do we forget? To what extent do we control the flow of information in the brain? Which mental activities are automatic, and how do they become so? These are some of the questions we will examine.

Prerequisite: Psychology 100 or Psychology 101.

# 214B Learning, lect.: 3 hrs.; V. LoLordo

Traces the experimental study of learning from the turn-of-the century research of Pavlov and Thorndike to the present. Development of the leld of animal learning will be described in terms of the ways in which particular conceptions of the earning process have guided experimentation, and have in turn been revised on the basis of the outcomes of that experimentation. Among the nost important concepts discussed in the course are: association, attention, biological constraints on learning, classical conditioning, discrimination, expectancies, law of effect, learning-

Prerequisite: Psychology 100 or Psychology 101.

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 and interpreted by the nervous system. What properties of the nervous system determine how we interpret information that stimulates our senses? How do we perceive patterns, colours, shapes, and sounds? How does experience influence and modify perception?

Prerequisite: Psychology 100 or Psychology 101.

Moore. This class will examine the natural and, to a lesser extent, the laboratory behaviour of several intensively-studied species. Foraging and communication, aggression and sex, predation and defence will be studied as they occur in such organisms as the honeybee, bat and noctuid moth, pigeon, rat and chimpanzee.

Prerequisite: Psychology 100 or Psychology 101 or Biology 1000.

# G. Goddard.

This class is designed primarily for students who wish to gain further experience and understanding of contemporary psychological research. A student who enrolls in the class chooses a member of staff who will serve as his class advisor throughout the academic year. The student will be expected to conduct independent research of his own under the supervision of his class advisor.

Prerequisites: Previous or concurrent enrollment in two other 300-level classes; and may be registered for only with the prior consent of the instructor.

# performance distinction, operant conditioning, S-S and S-R bonds, and stimulus control. The value of various approaches will be discussed with respect to several goals: (1) providing truly general principles of learning; (2) understanding the behaviour of particular species; (3) direct application to human problems. Throughout the term, the emphasis will be 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 great number of facts about animal learning.

215 Perceptual Processes, lect.: 3 hrs.; Staff.

216B Animal Behaviour, lect.: 3 hrs.; B.R.

300 Independent Research in Modern Psychology, seminar and lab.: 4 hrs.; R. Klein,

301 Advanced General Psychology, 3 hrs. with additional meetings with the instructor; J.W. Clark, V.M. LoLordo, W.K. Honig.

For the advanced student, this class reviews general psychology with the aim of consolidating the student's knowledge of the foundations. The method is unconventional.With the assistance of the instructor, the student prepares the material assigned to Psychology 101 at a level which will enable him to instruct introductory students in individual tutorials. There are no examinations. The grade is based on the quality of two projects undertaken by the student in the first and second terms. Students are advised to consult with the instructor in order to begin preparation some months before classes start in the fall.

Prerequisites: The consent of the instructor, Psychology 200, and at least concurrent registration in other 300-level psychology classes.

# 304 Learning and Motivation, lect.: 2 hrs, lab.: 2 hrs.; R.L. Rudolph, W.K. Honig.

Psychology 304 deals with the fundamental principles of learning derived from research with animal and human subjects. Since most of these principles have been discovered and investigated in experiments using animal subjects, primary emphasis is placed on animal learning. The discussion of human learning emphasizes those aspects of behaviour that are unique to man -language and abstract thinking - in addition to more general phenomena such as transfer and forgetting. Motivation is not studied as a separate topic but is discussed in terms of its effect on learning and performance.

Laboratory sessions involve (a) experiments with animals and human subjects, (b) discussion of the applicability of learning principles to everyday behaviour, and (c) an occasional film.

Prerequisite: Psychology 100 or Psychology 101 (Honours), Psychology 200 (General). (Note: Beginning in the academic year 1978/79, Psychology 214.)

305 Perception, lect.: 2 hrs.; lab.: 3 hrs.; D.E. Mitchell, M. Cynader, D.M. Regan.

Psychology 305 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 covered in the class falls into four section.

1. The methodological and theoretical problems peculiar to the study of sensation and perception;

2. The transformation of physical stimulus energy

into neural energy, and the processing of this i formation achieved by the nervous system.

3. The psychological analysis of sensations and their relation to the known facts of sensor physiology;

4. The effects of higher processes, such recognition, attention, and memory, on the way which sensations determine how we perceive the world.

The majority of the class will be devoted to visial and hearing in human beings.

The experimental work to be presented has been selected for its importance in the theoretina understanding of perceptual processes, and the student will be expected to organize his work around theoretical rather than factual questions

The lab work will consist of a general introduction to the apparatus and methods used in perceptua research, followed by experimental studies designed and carried out by each student in dividually.

Prerequisite: Psychology 100 or Psychology 10 (Honours), Psychology 200 (General). (Not Beginning in the academic year 1978/79 Psychology 215.)

# 307 Physiological Psychology, lect.: 2 hrs: Lab.: 3 hrs.; S. Nakajima.

Physiological psychology is an attempt to explan from a biological point of view. The class begins with a review of the structures and functions of the central nervous system, and the sensory and motor systems. It continues with an analysis of anatomical, physiological, and biochemica mechanisms underlying perception, motivation and learning.

Two types of background knowledge and necessary to understand physiological ps chology. First, students should have gener knowledge in biology, which can be obtained taking Biology 1000. Second, they should familiar with the concepts and methods of a perimental psychology.

Prerequisite: Psychology 200 and at least of class in Biology or Psychology 207.

# 308 Experimental Social Psychology, lecthrs.; J. Barresi.

This class concerns the study of indivi behaviour as a function of social stimuli with s phasis on extensive student research proje and class presentations. The class develops

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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. What determines the impressions, how others influence our beliefs and opinions, how decisions are made, and why people discriminate against members of other ethnic groups are all topics which will be considered.

prerequisites: Psychology 100 or Psychology 101 (Honours), Psychology 200 (General). (Note: Reginning in the academic year 1978/79, Psychology 208.)

ang Early Development, lect .: 2 hrs.; "field work" or lab .: 2 hrs.; K. Bloom. (This class is not offered in the period covered by this calendar.)

psychology 309 is designed to study the hiological and behavioural basis for the development of human behaviour. To this end, we consider the concepts of development, evolution, and genetics as they apply to the understanding of our species' heritage. Human development begins at conception when the genetic structure and the earliest environment of the individual are determined. In Psychology 309 we study human cametogenesis, fertilization, embryonic and fetal development while considering prenatal environmental influences which together describe the development of the unborn infant as characteristic of its species and its individuality. During the process of parturition, genetic, physiological and behavioural changes occur which signify the newborn's adjustment to extrauterine life. For survival, the young human's environment includes a caregiver and is, therefore, a "social" environment. An infant's first social relationship, i.e., mother-infant interaction, may serve as a clue or as a prototype of later social behavioural "styles." Developmental changes in processes such as perception, language, and cognition are discussed with reference to the influences of the infant's social environment.

Prerequisites: Psychology 100 or Psychology 101 (Honours), Psychology 200 (General).

312 Issues in Clinical Psychology, lect.: 2 hrs.; seminars and labs.: 2 hrs.; C. Adamec, K.E. Renner.

As with most areas of any science sacred cows noam 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 of the class is to help students learn how to present, listen, and participate in seminars. The issues taken up in the seminars in-

instructor.

Earhard.

A child enters this world without a memory, thought or language -- with only the requirement that certain basic needs be satisfied. Within two years, a child has a well-developed memory for people, events, and words, as well as the capacity to communicate verbally with others. Cognitive psychology is not concerned with providing a description of the developmental process, but rather with ascertaining the character of mechanisms that must underlie such human abilities. Cognitive psychologists ask such questions as: How does an individual recognize an object when it is in different contexts or orientations, when each shift in position or orientation produces a different pattern of stimulation on the eye? How much of daily experience is committed to permanent memory, and by what processes is it memorized? How is information stored in memory, and how is information lost from memory? In general, it can be said that cognitive psychology is concerned with developing explanations and mechanisms to account for thought and language in the human organism.

Prerequisites: Psychology 100 or Psychology 101 (Honours), Psychology 200 (General). (Note: Beginning in the academic year 1978/79, Psychology 213.)

315A Psychological Testing and Evaluation, lect.: 3 hrs.; K.E Renner. (Not offered in the period covered by this calendar.)

This class will provide an introduction to psychological testing. The major emphasis will be on the assessment of intelligence.

In addition to discussing the validity, reliability and general usefulness tests, the student will be expected to become proficient in the administration, scoring and interpretation of the Wechsler Adult Intelligence Scale, The Wechsler Intelligence Scale for Children, and the Stanford-Binet.

P.W. Jusczyk.

clude such topics as altered states of consciousness, concepts of intelligence, approaches to psychological testing, theories of schizophrenia, theories of therapies, women and madness, death.

185

Prerequisite: Psychology 201A, or permission of

313 Cognitive Processes, lect. 3 hrs.; B.

Prerequisite: Restricted to honours students.

319A Psychology of Language, lect.: 3 hrs.;

What is a grammar and why is it important to us? What do words "mean"? Can chimpanzees really learn language? How do we understand sentences? Is language really the royal road to the mind? These questions and many others are considered in the context of this course. Psychology 319A provides students with a basic introduction to how psychologists study language. The course is intended to provide a foundation for students who are interested in the study of language, thought and language development.

Enrollment is limited to 3rd and 4th year students or by special permission of the instructor.

Prerequisite: Psychology 100 or Psychology 101, and some background in information processing is suggested.

# 322 Community Psychology, lect.: 1 hr.; lab.: 2 hrs.; K.E. Renner.

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 will vary from year to year but may include such , topics as police relations with the public, social re-entry support for female offenders, diversion of youthful offenders from the criminal justice system, problems and issues in reducing rape, among others. Classroom work centres on concepts of community psychology and in teaching field research skills and techniques.

Prerequisites: Psychology 100 or 101 and Psychology 202 or 208 or 308.

353B Philosophy of Science and Experimental Psychology, seminar: 2 hrs.; W.K. Honig. (not offered in period covered by this calendar.)

An examination of methodological and conceptual issues in experimental psychology. Topics treated include the character of explanations, general statements, theories and theoretical entities in empirical psychology, as well as particular issues in current research programmes: concept-formation in non-humans; perception studies; computer-simulation. Readings from the works of contemporary psychologists and philosophers.

Prerequisite: One full class in Philosophy or Psychology beyond the 100 level, or consent of instructor.

357 Statistical Methods in Psychology, lect .: 2 hrs.; lab.: 2 hrs.; M. Earhard.

The object of this class is to familiarize the stu-

dent with the logic and application of the descrip tive and inductive statistical methods that are commonly used in the analysis of data in ex. perimental psychology. The material covered begins with the topic of frequency distributions and their characteristics, and progresses through parametric and non-parametric tests of signif icance, correlation and regression techniques analysis of variance and covariance. The general approach is to introduce each of a variety of statistical methods by reasoning through the ideas underlying the topic under consideration then discussing the general method of attacking the questions asked of the data, and finally work ing through specific problems in class. The classes are conducted as a combination of len tures and labs, and students are encouraged to participate actively and question often.

Psychology 357 is required for honours psychology students and qualifying graduate students. Other students may be admitted with the consent of the instructor. Although mathematical sophistication beyond the principles of elementary algebra is not required for successful completion of this class, students who are weak in arithmetic and basic algebra are encouraged to consult the instructor during the summer preceding their enrolment for assistance in preparing for the class.

Prerequisite: This class is primarily intended for honours students, but other students will be admitted with the consent of the instructor.

444B Cognitive Development Topics, lect.: 3 hrs.; P.W. Jusczyk. (Not to be offered in the period covered by this calendar.)

This class is intended for students interested in issues in cognitive development who would like to pursue a topic in some depth. The actual comtent of the class will vary from year to year. In coming years, the topics are expected to include language development, the development of thought and reasoning, perceptual development and moral development. The class is open to 3rd and 4th year students.

Prerequisite: Psychology 100 or 101, Psychologi 200, Psychology 209, or Psychology 319A and pel mission.

450A Functions and Structures of the Ner vous System, lect.: 3hrs.; M.G. Yoon, Meinertzhagen. (Not offered in the period covered by this calendar.)

Introduction to research problems in neusciences with electrophysiological methods.

Prerequisite: Psychology 207.

# psychology

450B Neurophysiological Laboratory, lab.: 4 nrs.: M.G. Yoon, I. Meinertzhagen. (Not oftered in the period covered by this calendar.)

introduction to research problems in neurosciences with electrophysiological methods.

prerequisite: Psychology 207.

458 History of Psychology, seminar: 2 hrs.; J.W. Clark.

we shall discuss the evolution of thought about some psychological issues that have been of central concern throughout man's intellectual history: the control of movement, the perception of space, the location of mind, the association of ideas, the nature of aberrant benaviour, the development of children, the behaviour of animals. The understanding of such issues will be traced in the writings of the major contributors from antiquity to the emergence of experimental psychology in the nineteenth century, and their development will be examined in the work of psychologists in the early years of this century.

Preparatory reading: It would be advantageous to the student to read E.G. Boring's History of Experimental Psychology before the class starts.

Prerequisites: Restricted to honours students.

464 Ethology, lect .: 2 hrs.; field/lab work: 3 hrs.; B. Rusak, H. James. (Not offered in the period covered by this calendar.)

Ethology is a relatively new science which bridges psychology and biology. In Psychology 464, we approach ethology through a survey of schools of thought concerning animal behaviour and a review of trends in field and laboratory research. This overview of the sciecne of animals behaviour is supplemented by observations of animals in both natural and experimental setlings. These observations illustrate techniques employed to study animal behaviour and allow the student to evaluate some of the theoretical formulations.

The format and the content of the class are somewhat variable and depend on the composition of the class. For example, topics or species of particular interest to the students may be examined in depth through discussions, paper presentations, or direct observations of behaviour.

Prerequisite: This class is primarily intended for nonours students, but other students will be admitted with the consent of the instructor.

<sup>465</sup> Honours Thesis, Members of the Depart-

ment.

report.

These are advanced level seminars designed to provide the honour student with both the breadth and depth of knowledge necessary for understanding recent research in various areas of psychology. The actual times of the seminars and class numbers will be arranged in the Fall. Topics typically offered include:

(1) Motivation, P. Dunham (2) Animal Learning, B. Moore (3) Perceptual Processes, M. Cynader (4) Topics in Animal Behaviour, B. Rusak (5) Human Performance, R. Klein (6) Human Information Processing, J. McNulty (7) Development of Social Behaviour, K. Bloom (8) Psychology of Women, C. Adamec (9) Applications of Conditioning and Learning, V.

- LoLordo

Psychology 465 is designed to acquaint the student with current experimental problems and research procedures in experimental psychology. Each student is assigned to a staff member who advises the student about research in his major area of interest, and closely supervises an original research project which is carried out by the student. Each student is required to submit a formal report of the completed research before the first of May. The final grade is based upon the originality and skill displayed by the student in designing his project and upon the submitted

Prerequisite: Restricted to honours students in their graduating year.

# 470 Seminar (2 hours)

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# **188** religion

# Religion

Professor Wilfred Cantwell Smith (Chairman)

# **Associate Professor** R. Ravindra

Assistant Professor C.T. Sinclair-Faulkner

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 experience. Understanding involves grasping simultaneously both the meaning of faith in the lives of participants, and the critical analysis of outside observers. Both the student who wishes to enhance his or her 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, will find material to engage them in the courses described below.

## **General B.A. in Religion**

Students wishing to major in Religion must successfully complete Religion 101, and at least four classes in Religion beyond the 100 level. This will provide them with a broad introduction to both Eastern and Western religion, and to the various ways in which religion may be studied. In the light of their specific interests, Religion majors will be encouraged to enrol in related courses offered by other Departments. Programmes should be planned in consultation with the undergraduate advisor, Dr. C.T. Sinclair-Faulkner.

101 Introduction to the Study of Religion, lect.: 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. Special emphasis is also given to developing reading and writing skills. A detailed syllabus is available from the Department of Religion.

## No prerequisite.

201 Western Religious Experience, Seminar format; 2 or 3 hrs.; C.T. Sinclair-Faulkner.

What has it meant to "be religious"? The Western

world has known many different ways: personal mystical, political, rational, sensual. Original ac counts of pagan, Jewish, and Christian religious experience will be studied in their historical con text, including Augustine's Confessions, the Kah balah, and Mary Daly's Beyond God the Father Each student will undertake a guided study of some twentieth-century religious experience for his or her choice. A detailed syllabus is available from the Department of Religion.

Prerequisite: Religion 101 or consent of instrue tor.

202 Religion and Culture in India, lectures and tutorials: 3 hrs.; W.C. Smith and Ravi Ravindra.

An introductory presentation of the major human outlooks on the world in present-day India especially Hindu and Muslim, with an examination of the historical background, including for almost a thousand years the Buddhist. Following this extensive synoptic consideration in the first term, an intensive reading of the Bhagavad Gita will occupy the second term.

Prerequisite: Religion 101, or King's Foundation Programme, or consent of the instructor.

221 Religious History of Canada, lect.: 2 hrs.: section meeting 1 hr.; C.T. Sinclair-Faulkner.

An historical study of religion in Canadian life from the sixteenth century to the present. Within a narrative framework, several issues will be studied: the way in which religion has shaped and been shaped by nationalism, economic drives, war and immigration; the change and development of religious institutions, including churches, charities, schools, and the federal government; religious practices and their impact on Canadian culture.

A detailed syllabus is available from the Department of Religion.

Prerequisite: Religion 101, History 120 or 220, or consent of the instructor.

251 Religion and Science. Seminar: 2 hrs. Ravi Ravindra.

An historical and analytical study of the relation ship between scientific inquiry and religiou aspirations and concerns. Particular emphasis will be placed on the writings of thinkers such as Kepler, Pascal, Newton, Goethe and Einstell each of whom combined scientific commitment and spiritual sensibility to a very high degree and has an enormous influence on intellectue history.

# religion

prerequisite: One class in Religion or one class in Science (preferably both).

Not offered in the period covered by this edition of the Calendar.)

302 Eastern Religious Experience. Seminar: 2 hrs.; W.C. Smith

An intensive study of the autobiography of the eleventh-century Muslim intellectual Ghazzali, of the life and some writings of the twelfth-century "neo"-Confucian Hsu Chi, the thirteenth-century Japanese Buddhist reformer Shinran, and the wentieth-century Hindu political leader and great Soul" Gandhi. In each case a consideration of the lives of the figures chosen will be complemented by an introduction to the sociohistorical context out of which each came and to which each significantly contributed.

Prerequisite: Religion 100 or Religion 202.

351/551 Modes of Knowing, Seminar: 2 hrs.: R. Ravindra.

An historical and critical study of the interrelationship of the three primary modes of empirical knowing: namely, science, art, and religion. All these three activities proceed by a combination of theory, observation and experience, but they understand and interpret them differently. Is it because their purposes and metaphysical assumptions are different and encourage different psychological attitudes and tendencies? The concern of this class will not be to prove one or the other of these "right" or "wrong" but to attempt to understand the nature of truth and order that man has sought through these ways. Readings will be taken from a variety of sources, with emphasis on the works or reputed sayings of acknowledged masters in each of these three ways of approaching reality, such as Jesus and Buddha, Blake and Leonardo da Vinci, Newton and Einstein.

Prerequisite: Any student at a third year of higher level may take the course; others will be permitted only with the consent of the instructor.

Not offered in the period covered by this edition of the Calendar.)

400/500 Faith and Belief: A Comparative Study, seminar: 2 hrs.; W.C. Smith.

A consideration of the possibility of a generic concept "faith" as intellectualizing an apparently universal human quality. Faith as conceptualized classically in Buddhist, Hindu, Islamic, Jewish and Christian instances will be explored, and religious belief as conceptualized there and in

modern Western thought. Through comparisons and contrasts the possibility will be investigated of perhaps understanding faith as a multiform human (or religious) constant. Limited enrolment.

Prerequisite: Knowledge of at least one classical scriptural language (Hebrew, Greek, Arabic, Sanskrit, Chinese, etc.); some philosophy or history of religion, preferably both.

# 189

# 190 russian

## Russian

Professor • Yuri Glazov (Chairman)

**Associate Professors** Irene Coffin

N.G.O. Pereira

**Assistant Professors** Nicholas Maloff Natan Nevo

The Russian Department offers courses in Russian language, literature and culture in the context of the Russian historical experience. It is difficult if not impossible to understand the flowering of Russian letters in the age of Pushkin without taking into account the social reforms of the 18th century, the Decembrist Revolt, the impact of the French Revolution and of German Romantic Idealism upon Russia. Russia, in short, must be understood and studied as a part of Europe.

This is not to deny the uniqueness of the Russian contribution. For, among other things, it was the typically Russian "civic" tradition which led to the building of the first proletarian-socialist state in what was considered the most backward part of Europe. That daring attempt was foreshadowed long before 1917. In fact, literature emerged as the chief medium of popular instruction and inspiration in the reigns of Nicholas I and Alexander Il and that tradition has survived. It is enough to mention the names of Dostoyevsky, Turgenev, Tolstoy, and in more recent times those of Mayakovsky, Mandelstam, Pasternak and, of course, Solzhenitsyn to appreciate the powerful continuity of this phenomenon.

Russian at Dalhousie University is taught with the aid of one of the most up-to-date language laboratories in Canada. The main emphasis is placed on the spoken language to enable the student to gain an extensive working vocabulary and a basis of grammatical concepts. Late afternoon classes are offered in some courses to accommodate students who are unable to attend lectures in the day-time. Various extracurricular activities such as plays, guest speakers and films provide ample opportunities for broadening the scope of the student's Russian studies.

There are two parallel Russian programmes: (1) Study of the Russian language from the introductory level (Russian 100), intermediate Russian (Russian 200 and 201), to advanced Russian (Russian 300, 301, 302 and 400).

(2) Study of Russian literature and culture (Russian 104 - Russian Culture and Civilization; Russian 203 - Russian Literature and culture in the Last Three Decades; Russian 205 - Survey of Russian Literature; Russian 302 — Russian Prose and Poetry; Russian 303 - Russian Drama; Rus sian 305 — 20th Century Russian Literature; Rus sian 306 - Tolstoy; Russian 307 - Dostoevsky and his Age; Russian 403 - Russian Masterpieces of Literature, Criticism and Thought.

# Degree Programmes

Courses 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.

3. with courses in another foreign language form. ing parts of a combined honours degree.

## **Classes** Offered

100 Elementary Russian, lect.: 3 hrs.; Irene Coffin/Nicholas Maloff/Natan Nevo. No prerequisites.

This class is designed for students who have no previous knowledge of the Russian language, Classes are kept small so that all students can actively participate in the conversations and thereby rapidly develop their proficiency in the language. The programme is closely correlated with intensive language laboratory work. Equal emphasis is placed on developing oral and reading skills with a sound grammatical basis.

104 Russian Culture and Civilization, lect.: 2 hrs.: Nicholas Maloff. Conducted in English. No prerequisites.

This class examines the evolution of Russian culture and civilization from the earliest pagan origins to the present day. Following a brief in troductory classification of historical and cultural epochs, this course will concentrate on literature. art, architecture, music, political and social cond tions, religion and other related topics throughout the history of Russia. Numerous masterpeices of the Russian arts will be illustrated with films. slides and recordings.

200 Second Year Literary Russian, lect. hrs.; Nicholas Maloff

This course is a continuation of Russian 100.01 and reading skills and a further knowledge grammar are developed through the study of Rus sian texts.

# russian

prerequisite: Russian 100 or equivalent.

201 Second Year Scientific Russian, lect.: 3 hrs.; Natan Nevo.

This course is a continuation of Russian 100. It is designed to develop translating skills with a continuing study of grammatical concepts through reading original Russian scientific texts and other related materials.

prerequisite: Russian 100 or equivalent.

203 Russian Literature and Culture in the Last Three Decades, lect. and discussion: 2 hrs.: Yuri Glazov. Conducted in English No prerequisites.

This course traces the political and cultural history of Soviet Russia since the last years of stalin's rule. Among the major issues considered are the significance of Stalin's death, "The Thaw" and De-Stalinization, Boris Pasternak's Doktor Thivago, Solzhenitsyn's One Day in the Life of Ivan Denisovich, the decline and fall of Nikita Khrushchev in 1964, bureaucratic politics versus intelligetsia witness-bearing, the political trials of the 1960's and the Czeckoslovak "events" of 1968, the moral protest movement of Akademik Sakharov and others, the religious revival amidst the intelligentsia, the juxtaposition of Russia and the West, the meaning of detente.

205 Survey of Russian Literautre, lect .: 2 hrs.; Nicholas Maloff. Conducted in English. No prerequisites.

This class traces the evolution of Russian literature from its earliest beginnings to the present time. Following a brief introductory classification of historical and literary epochs, the first term will concentrate on the analysis of representative works of the Ancient Kievan and Muscovite periods, the era of Russian Classicism, as well as the outstanding writers of the nineteenth century up to the year 1881 including Pushkin, Gogol, Dostoyevsky, Turgenev and Tolstoy. The second term will be devoted to the study of pre-revolutionary writers such as Chekhov and Gorky and the leading postrevolutionary writers including Mayakovsky, Sholokhov, Pasternak, Solzhenitsyn and the underground literature of Samizdat.

300 Conversational Russian, lect.: 3 hrs.; Irene Coffin.

Prerequisite: Russian 200 or 201, or by arrangement with the instructor.

Coffin.

302 Russian Prose and Poetry, lect.: 3 hrs.; Yuri Glazov Conducted mainly in Russian

This course aims to read, translate and critically interpret a series of the best short stories written by great Russian authors, including Pushkin, Tolstoy, and Chekhov. A number of well-known verses of great Russian poets, including Lermontov, Mayakovsky, Mandelstam and Pasternak, will be read, rendered and interpreted as well. Original texts will be supplied with vocabularies and grammatical notes. Texts will be chosen according to the level of students' knowledge.

303 Russian Drama, lect.: 2 hrs.; Naton Nevo. Conducted in English.

No prerequisites.

The Russian dramaturgical school which has produced such great masters as Fonvizin, Pushkin, Turgenev, Gogol, Ostrovsky, Chekhov, Gorky, Mayakovsky and is deeply rooted in the Russian traditions of art. Although this school constantly strove to retain its characteristically Russian national image, it evolved under the strong influence of Shakespeare, Moliere, Racine and others, and has, therefore, created a unique synthesis of the best Russian national and foreign elements.

Following a brief introduction to the early beginnings of the Russian drama, the course will concentrate on a detailed study of the representative

The aim of this class is to develop in students the ability to express themselves freely and correctly on a variety of topics in present day Russian social, tical and sceintific life.

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301 Russian Area Studies, seminar; Irene

Conducted in Russian.

Prerequisites: Russian 200 or 201, or by arrangement with the instructor.

This seminar traces Russia's past through a study of its hsitory, geography, and cultrue. Students present reports on various topics concerning Russian life-past and present.

Prerequisite: Russian 200 or 201

The immense wealth of the Russian dramaturgical heritage has become an object of universal recognition. One of the world's most celebrated theatre of our time, The Moscow Art Theatre, has not only served as the stage for many spectacular premieres, but also as the laboratory in which the "methods" of Stanislavsky and Nemirovich-Danchenko were perfected.

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# works of the 19th and 20th centuries.

305 Twentieth Century Russian Literature, lect.: 2 hrs.; Nicholas Maloff.

Not offered in 1976-1977. Conducted in English. No prerequisites.

306 Tolstoy, lect.: 2 hrs.; Natan Nevo.

Not offered in 1976-1977.

Conducted in English.

## No prerequisites.

307 Dostoyevsky and His Age, lect. and discussion: 2 hrs.; Yuri Glazov

## Conducted in English.

This course traces the dramatic life of Dostoyevsky and makes an analysis of his main masterpieces. Lectures combined with discussions will initially concentrate on literary activities in Russia of that time. Students will read a few of his works, like "Poor Folk", "Notes from the Underground", "Crime and Punishment", "Idiot", "The Possessed", and "The Brothers Karamazov". Along with some attention paid to the form of his prose, polyphony and other expressive means, considerable place will be given to analysis of his works' content. Dostoyevsky's impact on the ideas of Nietzsche, Freud and prominent existentialists will be traced also.

# 400 Advanced Russian Conversation and Composition, lect.: 3 hrs.; Nicholas Maloff.

# Not offered in 1976-77.

403 Russian Masterpeices of Literature, Criticism and Thought, seminar: 2 hrs.

Not offered in 1976-77. Conducted in Russian.

# 499 Russian Special Topics, staff.

This course is designed to offer the student an opportunity to work with an advisor and to research subjects which are not regularly offered by the Department. These may include literary, linguistic or other topics related to Russian studies. Students who wish to register for a specific programme should consult the chairman of the Department.

Prerequisite: Russian 300 or equivalent.

**Russian Studies Programme** 

# Participating Faculty:

Yuri Glazov (Professor of Russian) Michael MccGwire (Professor of Political Science) Irene Coffin (Associate Professor of Russian) Nicholas Maloff (Assistant Professor of Russian) Natan Nevo (Assistant Professor of Russian) Norman Pereira (Assistant Professor of History and Co-ordinator of the Programme)

The Russian Studies Programme is a special inter-disciplinary course of instruction whose pur pose is to allow Dalhousie students (as well as students from other Canadian Universities) in undertake intensive study of the Russian language and related fields. In order to par. ticipate, students must be able to demonstrate competence in the Russian language equivalent to two years of university courses (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 to be at Dalhousie or some other Cana. dian university, the second half to be at the Pushkin Institute in Moscow, USSR. Enquiries and applications should be addressed to the Director of the programme.

## Classes at Dalhousie

These classes represent the first term of classes given in the Russian Department.

199-14A Impressions of the Russian Revolution (Class description to be found under History 199)

**300A Conversational Russian** (Class description to be found under Russian 302)

**302A Russian Prose and Poetry** (Class description to be found under Russian 302)

304A 20th Century Russia (Class description to be found under History 304).

**305A Nineteenth Century Russia** (Class description to be found under History 305).

307A Dostoyevsky and His Times (Class description to be found under Russian 307)

309A Contemporary Russian Society, Yuri Glazov. Michael MccGwire, Nicholas Maloff and Norman Pereira

This class follows a seminar/discussion formal with four 3 week segments on literature, culture politics and history of the very recent past.

Classes at Pushkin Institute, Moscow

Russian Studies 301B, 303B, 305B, 308B, 310B.

# sociology and anthropology

# Sociology and Anthropology

Professors T. Bottomore D.H. Clairmont Kasdan I. Mangalam McDonald W.N. Stephens

# Associate Professors J.H. Barkow G.D. Bouma (Chairman) D.F. Campbell D.H. Elliott

J.L. Elliott H.V. Gamberg J.G. Morgan v Thiessen

# Assistant Professors

R. Apostle P. Butler P.G. Clark R R. Larsen V.P. Miller ID. Stolzman

**Visiting Lecturers** J. Burke B. Houghton

# Sociology: The Field

The sociologist studies the ways different human groups and societies operate and change. Within any society, sociologists may examine particular institutions like the family, religion, education, or the world of work. Another approach to sociological analysis focuses on such social processes as socialization, social conflict, social stratification, urbanization, industrialization, or modernization. A third common way of doing sociology is to examine social problems such as crime, racism, suicide, poverty, or alienation.

As part of a liberal arts education, sociology provides a context in which students learn to think critically about their social environment; become aware of the impact of social forces in their lives and the lives of others; develop skills of analysis useful in making their social environment; understandable and manageable. The career possibilities in sociology include research in government, industry, or university and teaching at the high school or university level. Many students Ind a sociology major helpful in preparation for social work, nursing, personnel management and other occupations that deal directly with people.

Anthropology: The Field Ours is a diverse species, both in biology and in the way we live. Anthropology is the comparative study of both our biological and cultural diversity. Traditionally, anthropology has consisted of four sub-fields: archaeology, anthropological linguistics, physical anthropology, and social/ cultural anthropology. Archaeology is the study of the material artifacts of past cultures and deals with such topics as the peopling of the New World, the hisotry of civilizations, and human evolution. Anthropological linguistics deals primarily with the relationship of language to culture; other topics include langauge structure and classification, and the development of techniques for studying unwritten languages. Physical anthropology is concerned with the biological evolution of our own, and related, species, and the distribution of differences in physical characteristics in living populations. Social/ cultural anthropology is the study of the way different peoples think and organize themselves-their culture and social organization.

A background in anthropology develops a broad view of us as a species, our many cultures and our biological background. Such an orientation broadens our appreciation of human possibilities and provides an invaluable perspective with which to explore interests in the other social sciences, the humanities, psychology, biology, and the medical and legal disciplines.

Formerly, anthropologists were interested primarily in small-scale, mostly non-literate, societies, studying them by participant observation and comparing aspects of culture and social structure. In recent years, however, anthropologists have begun to apply their unique methodological and theoretical perspectives to such diverse areas as mental institutions, urban life, government, and the spread of diseases.

Sociology and anthropology are both approved fields for concentration. In addition, the department offers honours programmes in sociology and anthropology. An honours degree is recommended, and frequently required, preparation for most advanced work in sociology and anthropology. Interested students are invited to contact the Undergraduate Committee for detailed advice on application and requirements for both programmes. Normally, an application for honours study is made on the basis of the results of the second year, i.e., towards the end of your fourth semester.

# Degree programmes

The anthropology programme within the department is currently under review. The anticipated changes will be in the direction of a closer integration of the sociology and anthropology pro-

grammes with the emphasis in anthropology to be on social and cultural anthropology. The precise nature of these changes are not yet known. Until the details are worked out, the existing degree programmes in the department will continue to be in effect. We wish to assure students that they will receive adequate notice of any changes affecting them and that the transition from the old to the new programme will be made in such a way as to cause them the least possible disruption.

## **General B.A. in Sociology**

Students enrolled in the general (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. Recommended classes for students who intend to major in sociology are listed below.

## Yearl

## 1. Sociology 100

2. At least one of Anthropology 100, Economics 100. Political Science 100, or Psychology 100. 3-5. Three classes chosen from fields other than Sociology.

## Year II

6. Either Sociology 201 or 224. 7-8. Two other classes in sociology. 9-10. Two classes chosen from fields other than sociology.

# Year III

11-13. Three classes in sociology. 14-15. Two other classes from fields other than sociology.

Sociology 100, as a general introduction, is normally a prerequisite for all advanced Sociology classes in the department. The content of this class is especially designed to provide students contemplating concentration in sociology with a solid foundation for subsequent study in the field. Multiple sections will be offered and each section will include lectures plus discussion in small tutorials. Students with high school Sociology may be permitted to take selected 200 level classes without having taken Sociology 100. 200level classes include all the classes normally taken by students concentrating in sociology. 300-level classes are structured primarily as seminar courses and ordinarily presume a fair degree of familiarity with the discipline. 400-level classes are restricted to honours students and qualifying graduate students.

## General B.A. in Anthropology

Students majoring in Anthropology are urged to include the following classes in their programme: 200, 227, 307, 325, and at least one regional ethnography class.

**B.A. with Honours in Sociology** 

The nine sociology classes above the introd tory level required for the honours degree sh include statistics (301), research methods in two classes in theory (401A, 405A/B), and honours seminar 450. The seminar paper pro ed in 450 will be examined as an honours the to be presented in an open meeting. This fulfill the university requirement that a stud pass a comprehensive examination covering honours work in order to receive an hono degree.

# **B.A. with Honours in Anthropology**

Nine credits in anthropology, above the introdu tory level are required, including Anthropole 451, 452, 453, and 459. Anthropology 459 carr two credits and consists of the writing, unr supervision, of an honours thesis. The the must be acceptable to at least two members the anthropology staff. Applicants to the n gramme are asked to contact the Undergraduate Committee. Admission is based upon a person interview and the examination of a paper which the applicant feels demonstrates her/his writing ability. Following admission to the programme each honours student must select one facult member to serve as principal advisor. In a cordance with University regulations, a student must pass a comprehensive examination in order to receive an honours degree.

## **Combined and Unconcentrated Honours**

Combined honours programmes can be arrange between sociology and anthropology, economic philosophy, political science, and psycholog Combined honours programmes with anth pology as one of the foci can be arranged with sociology and psychology. Combined honours in volving sociology or anthropology and other disciplines than those listed may be possible, the departments concerned agree. In any case students wishing to arrange combined or u concentrated honours programmes are advised seek the counsel of the departments involved a early as possible.

## **Canadian Studies Programme**

The Department is cooperating with several oth Departments in offering a Canadian Studies P gramme. Interested students should contact Pr fessor P.G. Clark.

## **African Studies Programme**

The Department is cooperating with several oth Departments in offering an African Studies P gramme. Interested students should contact Pro fessor J.L. Barkow.

## Sociology Classes Offered

The following classes are offered by the depe ment on a fairly regular basis. Those classes tually offered in any academic year are listed departmental brochure prepared each Ma Students entering their second and subseque

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years are advised to obtain a copy of the brochure from the department or at the registration desk.

# 100 Introduction to Sociology

Sociology 100 is designed to provide both a general introduction to the discipline of sociology generation as a foundation for more specialized study in the field. Emphasis in this class will be placed on basic sociological concepts, the nature of the sociological perspective, the logic of social inguiry, and recurrent theoretical and methodological problems of the discipline. In addition, some of the more important areas in sociology will be surveyed. In particular, this would include the study of family and kinship relationships, deviant behaviour, political and religious institutions, bureaucracies and complex organizations, ethnic and minority group relations, population trends, social stratification, and urbanization.

# 201 Figuring Out Society

this course is designed for students who for reasons of curiosity or practicality wish to acquire the skills used by sociologists to analyze social phenomena, but find themselves intimidated by statistical tables and mathematical symbols. A variety of quantitative and qualitative methods will be introduced which will enable the student to understand and evaluate both fact-finding and problem solving studies of social phenomena which are routinely carried out not only by academic sociologists, but also by practitioners in such fields as business, government, social work, public health, and education. Emphasis will be placed on the progressive refinement of a research project of the student's choice.

# 202 Comparative Sociology

This class looks at the ways by which similarities and differences between societies are investigated. Major emphasis is placed on a comparison of modern industrial societies with primitive, non-industrial ones. Sub-systems or parts of sociéties are also analyzed. These include factors such as family, economy, government, and social class systems.

# 203 Deviance and Social Control

Groups make formal and informal rules in an attempt to regulate and make predictable the behavior of their members. Violations of these rules occur in many different ways and stem from various causes. The purpose of the class is to examine both the processes by which groups make rules and the reasons why these rules are iolated. Specific issues such as crime, delinduency, narcotic addiction, alcoholism, prostitun suicide, and minority group relations are discussed in this context.

# 204 Social Stratification

his class analyzes the principal aspects of social

# 207 Socialization

Comparative materials on childhood and adolescence in a variety of societies will be presented. Interpretation of youth problems as resulting from special features of modern society will be reviewed. Effects of age-segregation, prolonged schooling, and delayed opportunities for work will receive special emphasis.

Socialization into teenage peer groups will be considered, as will professional socialization within selected university programmes in medical training. The students will participate in a research project which will include fieldwork on student life, and questionnaire, interview, and autobiographical material.

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.

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# 205 Sociology of Religion

This class analyzes the relations between religious beliefs and human behavior 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 behavior; the formal organization of the religious institution, social psychological considerations of religious behavior. The primary focus is on current religious movements in Canada.

# 206 Social Change and Modernization

This class is primarily concerned with the social and economic problems of underdevelopment in the Third World, with emphasis on the political and economic relations between industrially advanced and backward countries, and the forms which these relations have taken since political independence. An attempt is made to identify the economic and social causes of underdevelopment in this relationship. Critical attention is also paid to the traditional nature of pre-industrial societies and values as obstacles to industrialization and social change.

# 208 Communities

Sociology 208 examines a wide variety of territorially based residential groupings. The em-

phasis in the first term is on such features of natural communities as the ecology, neighborhood social networks, the power structure, and behaviour in public settings. Both the rural village and the metropolis is dealt with, in addition to such sub-communities as ethnic ghettos, slums, suburbia, and bohemia. Emphasis in the second term is on intentional communities such as utopian colonies, communes, company towns, and religious communities. Students are expected to design a model of an intentional community /

# 209/325 Sociology of Science and Ideas

The study of the social origins and organization of knowledge is an important aspect of contemporary sociology. This class is concerned with the examination of the body of knowledge known as modern science. The historical origins of science will be discussed. The social organization of contemporary scientific research will be examined using data drawn from major studies. The interaction between scientific community and society-atlarge will be analyzed. The relationship between modern technology and contemporary scientific research will be studied with particular reference to the impact of computers upon the development of modern social science.

# **211 Canadian Soceity**

An analysis of selected aspects of Canadian society employing theoretical perspectives and empirical materials. The aim of the course is to develop a composite view of the society as a whole through an understanding of the interrelationships between its parts. Major foci will include the integration and survival of Canadian society, structural change, and the management and consequences of inequality. Prospects for the future of Canada will be discussed in terms of these characteristics.

# **212 Minority Groups**

The social status of minority groups will be examined in the light of contemporary theories of prejudice and discrimination. The societal consequences of discrimination will be considered with respect to their effect on both minority and majority groups. Special emphasis will be placed upon an analysis of Canadian minorities.

# **213 Complex Organizations**

This class makes a critical study, from the comparative point of view, of theoretical models for the analysis of complex organizations. Students will examine the classical, structural-functionalist, and management science approaches to organizations. The class will entail a systematic survey of the sociological literature on this subject, with special concentration on organizational structure; strategy and decision-making.

# 214 Industrial Sociology

Recommended preparation: Sociology 204 or This class will examine the social relations dustry at both the micro- and macrosociologic levels of analysis. The course will deal prima with the productive system and attendant dustrial institutions of advanced capitalist sor ty. Major topics for investigation include the dustrialization process, the social structure of dustry, the development of trade unionism, and the sociology of work relationships.

# 215 Mass Society

This class deals with the origin of modern, pa industrial "mass society". Problems association with industrialization, cybernation, in technology, and environmental degredation examined in detail. Various attempts at solut of these problems are analyzed. The rise of "expert" and of counter-cultural movements a given particular attention. Theoretical methodological innovations for "future for casting" are introduced.

# 216 Sociology of Occupations

The class analyzes several social processes have to occupational careers, professionalization a formal organization of occupations. These or cesses are treated in the context of their implic tions for the relations between occupations and both social structure and human behavior.

# 217 Political Sociology

This course is designed to introduce students the major concepts and theories which information sociological study of politics. In addition to the general orientation particular attention will b devoted to the role of power and ideology m Western society, the interplay between econor and polity in contemporary North America, and political transformation as a social process.

# 219 Sociology of Women

The focus in this course is on theories attempt to explain the status and role of women, but across different contemporary societies and or time. Particular attention will be paid to the stal and role of women, both across different of temporary societies and over time. Particular tention will be paid to the status of women Canada - participation in the paid labour for politics, educational and cultural institution and comparisons made with other, mainly Eu pean, societies. There will be some study of feminist movement, and the intellectual imp tions of the feminist perspective in so science.

# 220 Sociology of the Family

Family in one form or another is an aspect of societies. It is the most important agent of t socialization and personality formation. The part of the course will be devoted to a consid

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tion of some of the cross-societial characteristics of family in general, and of the extended family as of lamity in traditional societies, in particular. The second term will be devoted to a consideration of amily characteristics in urban-industrial societies, concentrating on nuclear family. An atsocieties in the made to understand the processes by which family's structures and functions have by winder through time as societies evolved from a traditional to an urban-industrial social organiza-

# 222 Social Psychology

An intensive consideration of selected problems concerning how individuals relate to groups. theoretical and methodological issues will be equally stressed in an integrated fashion.

# 224 Sociological Theory - An Introduction

The class provides a systematic introduction into major topics in sociological theory. During he first term classical theorists up to 1920 are treated saint-Simon, Marx, Weber, Durkheim, Pareto, etc.) During the second term, more recent meoretical developments within the field are dealt with.

# 226B 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 to tribal and peasant politics to national politics in developing countries seen in a comparative framework.

# 237 Women in Latin America

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.

# 301 Statistics

This class is designed to give the student some experience at an elementary level with those branches of statistics which are most frequently used in the social science. In particular the student will learn when and how to use non-parametric tests. He will also be given a general introduction to factor analysis.

# 303 Social Problems and Social Policy

his seminar focuses 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.

# **306 Modernization and Development**

Asia.

This class presents an analysis of the interrelationships of population and social structure. It examines changes in size, structure, and distribution of world population in terms of the three major components of demographic change: fertility, morality; and migration, with emphasis on their social, economic, and political causes and consequences.

# **310 Research Methods**

This class will provide a detailed survey of the basic methods of social research. The topics discussed in the class 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.

Sociology has been interested in work since the early origins of the discipline. Much less attention has been given to leisure. Currently, there is an increased emphasis upon the analysis of leisure among sociologists. This course deals with the historical and cultural origins of leisure time as a major social phenomenon, with factors affecting variation in amount and use of leisure time among individuals in Western societies, and with social consequences of trends toward more increased leisure. The course is planned as a seminar; readings are primarily based on journal articles.

# **312 Social Conflict**

This course will endeavor to introduce students to the various analytical perspectives sociologists have employed to understand the

The class will treat change, modernization, and development as distinct but related notions. Beyond examining the meanings and implications of these terms, an attempt will be 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

# 308 Seminar - Soc. Psych

This Seminar involves the detailed examination of selected topics in social psychology ranging from the attitude - behavior controversy to behavior modification, social engineering, socialization, or conformity. A background in either (preferably) sociology or psychology is presumed.

# **309 Population and Society**

# 311 Sociology of Leisure

patterning and consequences of conflict in society. In this regard particular attention will be devoted to the functional, coercion, and Marxian theories of conflict. This course will further be concerned with conflict in contemporary society, with special reference to patterns of conflict and change in Canada.

# 313 Sociology of Health and Illness

Beliefs and attitudes surrounding disease concepts and treatment will be examined in primitive and contemporary societies. In addition, the social organization of medicine will be examined with respect to the following: the health professions, the hospital as a complex organization, and the larger society.

## **316 Sociology of Education**

See Education 4000. Students wishing to take the Sociology of Education for a sociology credit register for Sociology 316 and attend Education 4000.

# **318 Issues in the Theory of Society**

An examination of the problem of order in modern large-scale societies. The major focus will be the tension between continuity and change in such social systems and the alternative ways in which perspectives on this tension have been developed. In particular there will be analysis of the relationship between value integration and conflict approaches.

# **319 Social Movements**

This seminar examines both conventional (Formal) and contemporary (action) approaches to social movements - viewed as efforts by individuals and groups to challenge culture-values, social institutions and/or a political order. Focus is upon participant observation, with particular attention to developments in Nova Scotia and the Atlantic region.

# **321 Criminal Law and Law Enforcement**

Roughly half of this course deals with the development of theories of criminal law, law enforcement and criminal behaviour, from the eighteenth century on. The second half involves a critical examination of Canadian criminal law and law enforcement agents - the nature and amount of crime, policing, the courts and correctional agencies.

# 324 Sociology of Crisis Intervention

Emphasis is placed on understanding and investigation of the social significance and impact of the Distress Center phenomenon within our society. The course itself provides students with two learning experiences. On one level it enables students (a) to gain practical experience working with a social agency, and (b) to make participant observations. On another level students will be sociologically investigating and reporting (in theoretical or research paper) an aspect of c Intervention.

# 326 The Development of Sociology as Discipline

This is a course in the "Sociology of Sociology The main concern will be the manner in w sociology came to be a distinct field of enquin the late nineteenth century, and why it took forms it did. Special attention will be given to divergent paths of Sociology in the United Sta Great Britain, Germany, and France in order analyze the relationship between the sociologic enterprise and its social context. It will be an an vantage to have taken prior courses in the histor of sociological thought and in the sociology knowledge.

# 327 Sociology of Careers

This course will focus on the career-choice process in late adolescence and early adulthout Theories of career-decision and vocational maturity will be reviewed; the student will contribute to a class research project on university career-choice problems. Also treated will be the changing occupational structure and its effects on youth's opportunities; and recruitment and career lines in selected occupations.

## 331 Time and Society

This class will deal with the way man organizes and budgets time. Of particular interest will be the dichotomy in Western society between work time and leisure time. In particular, the class will deal with the historical and cultural origin of leisure time as a major social phenomenon, with factors affecting variations in amount and use of leisure time among individuals in Western society.

# 401B History of Sociological Thought

An examination of the development of classical sociological theory. Major theorists will be compared with special reference to their discussions of the development and structure of model society and their contributions to contemporary sociology. Those contributors under discussion will include the British empiricists, Spencer Marx, Durkheim and Weber.

# 405A Contemporary Sociological Theory

In this class a number of recent theoreticdevelopments in sociology will be critically en amined. The choice of specific theoretical topus will be left up to the instructor.

# 450 Honours Seminar in Sociology

Oral presentation on selected theoretical a research topics will be made in seminar and in ly completed as written papers. Topics will b selected to fit the specific needs of individual sl dent's honours programmes.

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451A Readings in Sociology 451B Readings in Sociology 452A Readings in Sociology 452B Readings in Sociology

na reading class the student is assigned to a nember of staff for regular meetings to discuss readings in a selected area. Papers and research projects will be expected. Prerequisites: Written ermission of instructor.

# Anthropology Classes Offered

As a general rule, most classes above the 100 Ryel require either Anthropology 100 or permisof the instructor as a prerequisite.

a supplement containing additions to and deleinns from this list of classes will be issued by the nepartment. Students in their second and subsequent years are urged to pick up a copy of the mimeo "Anthropology Classes" available each March from the department, and at registration.

if you are interested in an aspect of anthropology for which no class is offered, you are invited to discuss the possibility of a reading or experimental class with the faculty.

# 100 Introductory Anthropology.

This class introduces students to all subfields of anthropology. Topics considered include: the variety of human societies and how societies are rganized and function in their environments; ominid relationships to the other primates; numan evolution; principles of archaeology, parcularly as applied to North American prehistory; and the study of languages around the world as hey relate to the cultures they are part of.

During both terms, films will be used to present concrete examples for analysis.

# <sup>01B</sup> The Best of Anthropology.

s one anthropologist put it, anthropology is mere you find it--which means that it is erywhere you care to look. In this course, topics apping with biology, history, sociology, vchology and linguistics will be discussed by tious staff members. Some examples are the gins of sex, language, oneupmanship, human dies, and kith and kin.

ter grade of B or better will permit entry to her level anthropology courses which ordinari-<sup>equire</sup> anthro 100 as a prerequisite.

# <sup>MB</sup> An Introduction to Archaeology.

class covers the following topics: ar-<sup>sology</sup> 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 prehistoric past; an outline of the reconstruction of the prehistoric past; an outline of the prehistory of Eastern North America; the prehistory of Nova Scotia. The course will also involve practical work in the archaeological collections at the Nova Scotia Museum and, weather permitting, at least one field trip.

# 201 Dawn of Civilization.

The first Civilizations came into being in Mesopotamia, Egypt, the Indus Valley and China in the Old World. We shall examine the problem of the origin of these Civilizations in the light of the latest archaeological 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?

Prerequisite: permission of instructor.

# 210 Ecology and Culture.

It is clear that the ecology (meaning the natural environment) is affected by the way people live. It is less clear how the way people live is affected by their ecology or environment. This course deals with the ways in which different environments affect how people live, relate to one another, think and organize themselves. The major focus will be on how cultural choices are influenced and constrained by the relationship among ecology, technology, and how people are making a living. Examples of hunter-gather, horticulturalist, rancher and farmer cultures will be used as illustrations. Classes will be a combination of lecture and seminar sessions, and two term papers will be required.

Prerequisite: Anthropology 100 or permission of instructor.

# 220A Social Anthropology.

An examination of alternative ways of analysing culture and society. Illustrative case studies will be used which represent a variety of geographical areas, types of society (i.e., from simple band to urban industrial) and theoretical perspectives. Since different theoretical perspectives have been applied to specific institutions (economic, political, religious, kinship, etc.), such institutions will be examined where appropraite.

instructor.

222 Psychological Anthropology. This class deals with the areas of overlap between psychology and anthropology. Topics to be

Prerequisite: Anthropology 100 or permission of

covered 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 will be required.

Prerequisite: Anthropology 100 or Psychology 100 or permission of instructor.

# 226B 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 to tribal and peasant politics to national politics in developing countries seen in a comparative framework.

Prerequisite: Anthropology 100 or permission of instructor.

# 227 Language and Culture.

This course offers an introduction to aspects of linguistics, which relate to anthropology. The history of anthropological linguistics will be reviewed, with particular attention paid North American workers in the field, including Boas, Sapir, and Kroeber. Current areas of study in anthropological linguistics, such as sociolinguistics, ethnoscience, and language change, will be examined. The relation of language to culture will be considered, drawing on examples from primitive and complex societies. Students will also learn to record sounds phonetically, and to analyze the sounds and words of a language to culture will be considered, drawing on examples from primitive and complex societies. Students, will also learn to record sounds phonetically, and to analyze the sounds phonetically, and to analyze the sounds and words of a language into meaningful units for the speakers of that language.

Prerequisite: Anthropology 100 or consent of the instructor.

# 229B Belief Systems.

This class introduces the student to the study of non-Western belief systems. Emphasis will be on the religion of small-scale societies, treated from the perspective of religion as a system of symbols giving meaning to the universe and one's place in it. Topics will include religion as a biologicalphenomenon, the nature of ritual, religion and healing, religion and altered states of consciousness, sorcery and witchcraft, religion and culture change.

Prerequisite: Anthropology 100.

# 231A North American Indians.

This class provides a general introduction to Indian cultures in North America, as these cultures existed in pre-European times and as they

changed in response to the presence of peans. Following a consideration of New in prehistory and demography, the course will representative tribes of each geographic "cui area" in North America. It will conclude w discussion of present-day Indians in Canada the United States.

Prerequisite: Anthropology 100 or consent of a instructor.

# 232B Ethnohistory of North American dians.

This class will study the history of Indian-Ma relations in North America, including the Un States and Canada, from the time of the Indi first contact with Europeans and Asians to present. Emphasis will be on presenting the history from the natives' point of view.

Students with history interests will take the course; students interested primarily ethnographic description of Native America cultures will take Anthropology 231A.

Prerequisite: Anthropology 100 or 231A or con sent of the instructor.

# 306A The Social Organization of Pre-Literate Societies.

This class gives a systematic and detailed description and analysis of the social organized tion of pre-industrial societies where men their living by gathering, hunting, herding, agricultural activities, and those segments of dustrial societies which combine tradition modes of adaptation with participation in mode markets (e.g., Maritime fisherman, etc.) Not a fered in 1976-77.

Prerequisite: Anthropology 100 or permission instructor.

# 307 Biosocial Anthropology.

The theme of this class is that many hun characteristics, both individual and social, species traits and are the product of biolog evolution. Topics to be discussed include thes thetic theory of evolution, the nature sociocultural evolution, the fossil record human evolution, the fossil record of hu evolution, the behaviour of apes and mon and the biopsychological basis of h behaviour. At least one paper will be required thropology 307 stresses the theoretical bas biosocial anthropology, while anthropology emphasizes empirical biosocial research.)

Prerequisite: Anthropology 100 or Psychology or Biology 1000.

# sociology and anthropology

308 Biosocial Research. This class applies the theoretical perspectives discussed in Anthrop 307 to empirical research. Representative topics include the study of nonverbal behaviour and communication, human ethology, sex differences, universals in emotional expression, and biological rhythms.

Class is the same as Psychology 361.

prerequisite: Anthropology 100, or a background in biology or psychology, or permission of instructor.

# 316 Africa: Ethnography and Modernization.

This class introduces the student to the anthropological study of the peoples of Africa. The class is organized in terms of subject areas rather than ethnic units or geographic regions. Topics to he discussed during the autumn session will include general background, family and social organization, economics and livelihood, politics and government, and personality and socialization. During the spring session our focus will be on contemporary, rather than colonial or precolonial Africa. The major topic will be the influence of modernization on urban and rural life. A paper will be required. Students in Dalhousie's African Studies Program are cordially invited to register for this class.

Prerequisite: Anthropology 100 or permission of instructor.

# 320A, 320B Readings in Anthropology.

This class is intended for students who wish to delve deeply into a subject for which no appropriate advanced class if offered. The student and professor jointly decide on the requirements for the course.

Prerequisite: Written permission of instructor.

# 321 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 (economic, political, religious, psychological, etc.) are examined. Their applicability to traditional Canadian fishing cominities, and to French Canada, are examined. The role of peasants in modern social change is a major focus.

Prerequistie: Anthropology 100 or permission of

325 History and Theory of Anthropology. A course designed to acquaint students with the oundations and development of anthropology. The growth of theory in anthropology will be

instructor.

In this course the student will (1) be introduced to the cross-cultural research method, i.e., the testing of general hypotheses on large samples of ethnographic cases, with the analysis, in lectures and in readings, of selected cross-cultural studies of socialization; and (2) become expert on the ethnographic literature on one of the world's major culture areas (Latin America, Europe, Middle East, Africa, Southeast Asia, or whatever) as it treats a problem. The student will write at least one major paper, and participate in one or more (probably two) cross-cultural investigations.

Prerequisite: Anthropology 100 or permission of the instructor.

# 332B Ethnohistorical Method.

Ethnohistory is the study of the history of peoples normally studied by anthropologists. Following class review of pertinent literature on methods employed by ethnohistorians in reconstructing past cultures and the histories of non-literate peoples, each student will undertake an individual ethnohistorical project involving research in original documents in the Public Archives of Nova Scotia.

Prerequisite: Anthropology 232A or consent of the instructor.

This class focuses upon the tensions between ethnic ties and loyalties and the demands of citizenship in both old and new states. The focus is comparative covering a variety of geographical areas and societal types. We will examine the problems of integration in the new states of the Third World as well as the resurgence of ethnicity as a political factor in old states (e.g., Canada, Spain, Belgium, etc.). We will examine various explanatory models for these problems (e.g., class, plural society, etc.). Prerequisite: One of the following: a course in Sociology or Anthropology, Political Science or History.

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 anthropology points. Special efforts will be made to expose students to the original writings of prominent anthropologists.

Prerequisite: Anthropology 100 or consent of the

# 331 Cross-cultural Study of Socialization.

# 340 Ethnicity and Nationhood.

# 451 Proseminar in Anthropology

Intensive examination of major issues in an-

thropology. The first part of the class is devoted to a survey of major issues current in the field. During the second part, the student will present to the seminar his formulation and analysis of a particular problem.

# 452 Supervised Readings in Anthropological Theory and Method.

The student should secure written permission of the instructor before registering for this class. The student and his instructor will plan a programme of readings appropriate to the former's interests and background.

# 453 Readings in Ethnology.

The student should secure written permission of the instructor before registering for this class. The student and his instructor will plan a programme of readings essentially dealing with a geographic area (or areas).

# 459 Honours Thesis.

This class carries two credits. The student writes an honours thesis under the supervision of his principal advisor.

# spanish

## Spanish

**Associate Professors** 

G. Alfaro S.F. Jones, Chairman A. Ruiz Salvador

# **Assistant Professor** J.E. Holloway

After Chinese and English, Spanish is the most widely spoken language in the world. It is the native tongue of well over 200 million people live ing in 22 countries. Spanish is, therefore, of tremendous social, political, and economic importance.

Spanish America is making international head. lines as emerging nations struggle for independence and a new political identity. Students of political science, economics, commerce sociology-anthropology, psychology, literature history, and other academic disciplines will feel increasingly interested in Latin American studies as new solutions are adopted by these nations to modern-day problems. 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 diplomats, members of the foreign service, bankers, politicians, businessmen, interpreters, translators, teachers, professors, critics, editors, journalists, and many others. An undergraduate concentration in Spanish, followed by training at the Masters level in Administrative Studies, could lead to a variety of possible careers in the Spanish speaking world in international business and public service.

It goes without saying, of course, that a knowledge of Spanish would be of great benefit to anyone planning to travel or live in Spanishspeaking countries. Our beginning language course especially emphasizes conversational Spanish, and our Department awards some travel grants to outstanding students so that they may spend the summer living with Spanish-speaking families abroad. In this way we hope to acquaint students with the culture of the countries they are studying, as well as help them to acquire some measure of fluency in the language.

It is also 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.

# spanish

If your tastes and abilities lie in the direction of Spanish or Latin American studies, you should consider the possibility of taking a Bachelor's degree with Honours in Spanish, or with Honours in Spanish and another subject combined. Those who wish to do so, or to take Spanish as an area of concentration in a General Bachelor's degree course, are encouraged to discuss the matter at any time (but the earlier the better) with a member of the Department. An Honours degree is usually required for or facililates access to graduate studies.

# Spanish Degree Programmes

# General Bachelor's Degree

Course should consist of at least four full-credit upper-level classes taken in the second and third year, three 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:

# Yearl 1. Spanish 100 2. Spanish 110, 111. 3-5. Electives.

### Year II

6-8. Spanish 200, 201, 250, 251, plus one other 200 level class. 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 classes to be chosen from the upperlevel programme offered by the Spanish Department.

19-20. Two electives (May be Spanish).

In addition, students are required to write an Honours essay, 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. Students planning a combined Honours course should consider, however, that the number of classes taken in either subject might be insufficient for admission to many graduate programmes without at least an extra year's work.

Notes: 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.

needed.

For students with no knowledge or only a slight knowledge of Spanish.

This class is designed for students wishing to achieve proficiency in spoken and written Spanish. We will cover the first eighteen chapters of Spanish One, a textbook written and taught by members of the Department. This text avoids the usual chalk-and-blackboard dialogues often used in the classroom. Instead, it deals with the kinds of topical and controversial subjects that young 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.

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 of the class is to gain a clear picture of one of the most perplexing components of Western Civilization.

111B Spanish American Culture and Civilization, Alfaro. lecture and discussion, 2hrs.

(1) the "other" classes chosen as electives in the programmes outlined above must satisfy general

**Classes Offered** 

100R Beginning Spanish, Staff. Discussion and conversation, 3 hrs.; Language Lab.: as

110A Spanish Culture and Civilization. Ruiz Salvador. Lecture and discussion, 2 hrs.

# 204 spanish

Conducted in English. No prerequisites. Open to students in all departments. No knowledge of Spanish necessary.

Spain's discovery of the New World meant not only the creation of the first global empire in history, but also the boradening of material and spiritual horizons for European man. The Spanish conquest brought with it a new race, a new religion, and a new economic and political order. The superposition of Spanish elements on the autochthonous civilizations of Aztecs, Chibchas and Incas gave rise to a new Latin American civilization. The class will study representative works in English translation.

200A Intermediate Spanish, Alfaro. Discussion and conversation, 3 hrs.; Language Lab.: as needed.

This class will briefly review the first eighteen chapters of Spanish One, and then finish the text. Supplementary reading as necessary.

201B Reading and Conversation, Alfaro and Ruiz. Discussion and conversation, 3 hrs.

Emphasis will be placed on perfecting conversational skills as the reading material is discussed in class.

209A Women in Latin America, Jones. Lecture and discussion, 2 hrs.

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.

211A The Cuban Revolution: Communism in the Caribbean, Alfaro. Lecture and discussion, 2 hrs.

Conducted in English. Open to students in all departments. No prerequisites. 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 focuses on the problems and achievements of the Revolution, the peculiarities of Communism in a Caribbean society, and its effect on literature and the arts.

212B The Spanish Inquisition and its Challengers, Jones. Lecture and discussion 2 hrs. (Not given in 1977-1978).

Conducted in English. Open to students in a departments. No prerequisites. 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 effe tively the message Christ had originally offered to mankind. The Church had become a large and powerful institution, however, and viewed much of the criticism as an attack on its authority and a threat to its very existence. It responded h severely persecuting the dissenters and organize ing a movement later known as the Counter Refor mation. This class will attempt 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: Myth and Reality, Alfaro. Lecture and discussion, 2 hrs (Not given in 1977-1978).

Conducted in English. Open to students in all departments. No prerequisites. 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 will examine the literature and history of this phenomenon with particular attention to the twentieth century, and will attempt 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. Open to students in a departments. No prerequisites. No knowledge Spanish necessary.

The Spanish Civil War, probably more than an other war in history, compelled the leading write of the era to take a stand. As a rallying point is various ideologies -- Communism, Anarchis and Fascism -- it clearly defined the issue freedom versus tyranny. No war before or sin has provoked so many words and so much act from so many writers. Particular attention will given to Hemingway, Malraux, Bernanos, Sal Koestler, Auden, Neruda, Vallejo, Hernandez, D Passos, and Orwell.

# spanish

221B The Novel of the Mexican Revolution, Alfaro. Lecture and discussion, 2 hrs.

conducted in English. Open to students in all departments. No prerequisites. No knowledge of Spanish necessary.

The Mexican Revolution (1910-1917) is the first people's revolution of the twentieth century. The pre-revolutionary situation, the war, and its aftermath resulted in some of the finest Latin American noveis. This class will view these works against the historical and social background of contemporary Mexico.

222B Masterpieces of Spanish Theatre, Jones. Lecture and discussion, 2 hrs. (Not given in 1977-78.)

223A Contemporary Spanish American Prose, Holloway. Lecture and disucssion. 2 hrs.

Conducted in English. Open to students in all departments. No prerequisites. No knowledge of Spanish necessary. (Not offered in 1977-1978).

This class samples short stories and novels of contemporary prosists from throughout Spanish 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 Spanish America, but perhaps a rejuvenation in prose art of global consequence.

250A Introduction to Spanish Literature, Ruiz Salvador. Lect. and discussion, 2 hrs.

Introduction to the main works and trends in Spanish literature. Study of illustrative works.

251B Introduction to Spanish American Literature, Holloway. Lecture and discussion, 2 hrs

Introduction to the main works and trends in Spanish-American literature. Study of illustrative

302A Translation, Staff. Lecture and discussion, 2 hrs.

Exercises in translation from Spanish to English and from English to Spanish.

303B Composition, Staff. Lecture and discus-

This class will focus on two decisive periods of Spanish American history: the Spanish conquest and the contemporary revolution. Special attention will be given to the impact of European civilization on the Indian cultures, the system of economic exploitation, and race relations. Although most of Spanish America gained independence from Spain in the 19th century, the social and economic relations within the societies remained basically the same. Only in the 20th century was the situation challenged by revolutionaries. The class will examine the Mexican, Cuban, and Chilean revolutions and the guerilla movements in Latin America.

320B Cervantes, Jones. Lecture and discussion, 2 hrs.

Conducted in English. Open to students in all departments. No prerequisites. No knowledge of Spanish necessary.

This class will examine Cervantes' philosophy of life through an analysis of his great masterpiece, Don Quixote. In this precursor of the modern novel, Cervantes studies human nature in all its many aspects. Life is presented as a complex and ironic interplay of idealism and disillusionment, appearance and reality, chivalrous love and worldly love. All truth is relative, but the ultimate irony is felt by the reader himself who discovers, in the end, that Don Quixote's view of the world is superior to that of all the "sensible" people who judged him to be mad.

321B Borges, Holloway. Lecture and discussion, 2 hrs. (Not given in 1977-1978).

Conducted in English. Open to students in all

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Training towards accuracy in writing Spanish. Vocabularly building, free composition.

308B The History of Modern Spain, Ruiz Salvador. Lecture and discussion, 2 hrs.

Conducted in English. Open to students in all departments. No prerequisites. 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.

309A The History of Spanish America, Alfaro. Lecture and discussion, 2 hrs.

Conducted in English. Open to students in all departments. No prerequisites. No knowledge of Spanish necessary.

# 206 spanish

departments. No prerequisites. No knowledge of Spanish necessary.

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. (Not given in 1977-1978).

Conducted in English. Open to students in all departments. No prerequisites. No knowledge of Spanish necessary.

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 sociopsychological 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 focuses on Fortunata and Jacinta, his masterpiece.

350A Contemporary Spanish Literature, lecture and discussion, 2 hrs. Ruiz.

351B Contemporary Spanish American Literature, Lecture and discussion, 2 hrs. Holloway.

398A Reading course for majors.

399B 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

Theatre

# Faculty

Alan Andrews Laura L. Davidian Gordon Gordey Lionel Lawrence, Chairman **Robert Merritt David Overton** Peter Perina, Scenographer Pat Richards

## **Special Instructors**

Mirek Macalik (Perspectives) David Mardon (Technical Director) David Porter (Properties) Pam Ritchie (Costumes) Ian Thomson (Construction)

# **Canada Council Artist-In-Residence** Robert Doyle

Theatre is a performing art. It is rich, complicated and involves refined creative work in many dit. ferent fields. The Dalhousie theatre programme is a concentrated one, runs for four years, allows for choice by the individual student, and has certain clear biases.

The programme currently exists within the faculty of arts and science, and students wishing to achieve a theatre degree must expect to take certain classes outside the discipline of theatre. However the art of theatre is a consuming one and an overwhelming amount of the student's time will be spent in studying and practicing it.

The theatre programme demands certain firm reguirements and at times allows for choice by the student. The intention is to provide the best op portunity for each student to develop her or his in dividual preferences, and yet to ensure that each student becomes aware of the many subtle in tricacies of the theatre. With this in mind the current classes can be arranged in at least three ways to provide emphasis on a general theatre education, an acting concentration, or a scenographic one. The overall programme is flexible though, and students who discover new areas of interest as they proceed with their studies can in most cases, adjust their direction.

Every theatre student is expected to be involved regularly in production work, either acting or other areas of production. The performance theatre sometimes falls within the actual work a class, sometimes not. But the regular e perience provided by performance is axiomatic understanding the theatre, and theatre studen are expected to be part of as many pieces of p duction work each year as possible. Involveme in the local professional and semi-profession companies is encouraged.

# theatre

students who wish to study the theatre should draw up a plan of studies for a four-year prodramme. Each student should consult with the department chairman to make sure that the appropriate prerequisites are met and that the proposed programme falls within he university requirements for a degree.

The department is located in the theatre wing of the Dalhousie Arts Centre. The theatre wing is a self-sufficient unit involving one theatre, two studios, a roof theatre, and supporting workshops.

The department is developing close collaboration in certain theatre work with the Neptune Theatre. There are also opportunities to participate with other theatre groups who perform in the city of Halifax.

Some theatre classes by the nature of the work involved have a restricted enrolment. All students wishing to take any class in theatre should therefore first consult with the department.

# The Classes

The classes in theatre are designed to provide a sensible programme for a student proposing to graduate with a B.A. with Honours in Theatre. Some of the classes are for students in the honours programme only, but there are others that are open to anyone who is interested in the topic.

## How to Plan Your Programme

Step 1. Read the faculty regulations for: a) firstyear requirements (5.1.1), and b) honours programmes (5.3 and 5.3.51). Make sure you understand these.

Step 2. Read the descriptions of the theatre classes. Understand text of the nine theatre classes you will take after first year there are two particular theatre classes you must take: Theatre 201 in second year, and Theatre 490 in fourth year. Every theatre degree student must include these two classes in her or his programme of studies.

Step 3. Year by year organization. Normally you are expected to take five university classes a year. Given this, you should arrange to take three theatre classes a year after first year.

Year 1: Five classes. Theatre 100 and 105; three classes in other subjects. (Please read Theatre 399 description.)

Year 2: Five classes. Three in theatre; Theatre 201 and two other second-year theatre classes. (See the three programme recommendations and Theatre 399 description.)

Year 4: Five classes. Three in theatre; Theatre 490 and two fourth-year theatre classes.

gramme

Theatre students pursuing an honours theatre degree can arrange their theatre classes in several ways. The department recommends three particular arrangements:

No. 1 The general one. Year 2: Theatre 201, 270 and 280. classes. Year 4: Theatre 450, 460, 490.

No. 2 The acting stream. classes.

No. 3 The scenography stream. second-year class. classes. classes.

Each year offerings are being strengthened and in certain areas further professional training opportunities are introduced. Before registering for 1976-77 students should contact the department for information on recent developments.

**Combined Honours** Combined honours programmes of study in which theatre is related to some other discipline studied at Dalhousie also exist. Interested students should apply to the department for further information.

# Year 1

This class provides an introduction to the nature of the theatre as a composite performing art. It is intended to explore the nature and functions of the separate theatre crafts (acting, playwriting, scenography, directing) and to consider the diverse ways in which these crafts are, have been, and can be synthesized. The various sections will

Year 3: Five classes. Three in theatre; three thirdyear theatre classes (again see our programme recommendations because the overall programme you choose will provide your yearly selection in particular for third year.)

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Recommended Options in the Theatre Pro-

Year 3: Theatre 360, plus choice of two third-year

Year 2: Theatre 201, 202, 280. Year 3: Theatre 380, choice of two third-year

Year 4: Theatre 490, 481, 482.

Year 2: Theatre 201, 270 and choice of one

Year 3: Theatre 371 and choice of two third-year

Year 4: Theatre 490, plus choice of two fourth-year

Classes Offered

Theatre 100: The Nature of the Theatre, 3 hrs. lecture, discussion, performance.

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differ in the emphasis given to these crafts, but each section will involve work with written scripts, improvisation, criticism, and discussion leading to a basic understanding of the functions of theatre and the ways through which it has influenced society. The class is a pre-requisite for admission to the theatre honours programme, but is also designed to serve as an elective for the student who wishes to take a single class in theatre. Students who intend to enroll in the theatre honours programme should also register for Theatre 105 simultaneously with Theatre 100.

Theatre 105: Theatre Organization and Stagecraft, 2 hrs. lectures; 3 hrs. labs and work in productions.

This class is an introduction to theatre production. It provides 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.

The class involves two one-hour lectures and a three-hour lab weekly, added to which students will work on evening productions. 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.

## Year 2

Theatre 201 The History of the Theatre, 3 hrs. lect., discussion, demonstration.

This class is designed to provide the student with a basic and comprehensive understanding of the development of theatre and drama. Emphasis will fall on the crucial phases of that development, the classical theatre of Greece, the theatre in the medieval period and in the Renaissance, and its subsequent evolution until the rise of the modern theatre in the second half of the nineteenth century.

# Theatre 202: Modern Dance, 4 hrs.

This basic dance class is designed to introduce the student to the theories and techniques of modern dance; the use of space, rhythm, dynamics, kinesthetic; and aesthetic awareness and composition. The development of personal expression through the medium of dance will also be encouraged within the class.

# Theatre 220, Education 4620: Developmental Drama, 2 hrs. a day.

This class is designed to show potential or cur. rent teachers, or any person involved or in. terested 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 developmenta drama to school situations. Improvisations theatre games and dramatizations of social issues make up part of the class; various an proaches to drama in education are considered Regular practice runs through the class and each student taking it will work out an individually pract tical scheme to put into subsequent use.

# Theatre 270: Scenography 1, 6 hrs.

This class is designed to give students basic visual judgement and understanding. In the first half year, it follows that Bauhaus approach to graphic design but adapts it to the needs of three. dimensional theatre space. The second half of the year the course teaches perspectives; the final project is to integrate all the previous material and apply it to simple stage design. Student class work will be featured at the end of the year by the Dalhousie Art Gallery. Throughout the year analysis and criticism of various works are encouraged. The required text is Gyorgy Kepes' Language of Vision. Students must have the instructor's permission to enter.

# Theatre 280: Acting 1, 6 hrs.

This class involves work in movement, improvisation, role playing, voice and speech, and scene study.

### Year 3

# Theatre 301: Introduction to Film, 3 hrs. (Not offered 1976-77.

This is an introductory class for students with no background in film. Each week a film is screened and analysed. The class also involves an examination of film history, genre, and techniques, and requires extensive viewing of films outside those shown in classes. This is not a class in film production.

# Theatre 360: The Playwright in the Theatre, b hrs.

This class is concerned with the creation of theatrical events, usually, but not necessarily, or the basis of a formal written script. It may further involve a study of the playwright's sources for a theatrical event, a structural analysis of existing scripts and practical explorations of the ways In which a script can be prepared.

# theatre

# Theatre 371: Scenography 2, 6 hrs.

this class is for theatre honours and special scenography students only. It builds on the knowledge from the previous class in the field, theatre 270, as far as visual knowledge is conerned, and from technical knowledge acquired in theatre 105. 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 heatre and the methods of executing construcionally a designed work. They are introduced to ne directorial/scenographic relationship. Student class work is exhibited at the end of the year in the Dalhousie Gallery's annual exhibition. The required texts for this course are John R. Walker's Exploring Drafting: Basic Fundamentals and willis Wagner's Modern Woodworking. Students must have the instructor's permission to enter.

Theatre 380: Acting 2, (offered only in 1975-76)

The single credit component of Theatre 381.

Theatre 381: Acting II, 10 hrs./double credit. Can be taken as a single credit by arrangement with instructors (for 1975-76 only).

This is an advanced class in acting involving voice, character study, scene work, and improvisation.

# **Theatre 399: Production,**

This class is assessed on accumulated credit over three years. Students should therefore plan to accumulate the necessary credit from their first year. Credit is awarded for approved theatre work under faculty direction, either in cast or crew. Students will normally accumulate eight separate pieces of work for this credit. A student can enrol In this class in his third year, only if he has completed five approved pieces; the three remaining pieces of work will be specifically assigned. Grading will be on a pass/fail basis.

Prerequisite: Only available to third-year honours theatre students who have planned to take this class from their first year.

Year 4

Theatre 450: The Modern Theatre, 3 hrs. Not offered 1976-77.)

The modern theatre has been characterized by successive bursts of creative energy and experiment. This class gives students an opportunity to study these developments in detail and to examine several important theatrical theories. Their

production.

# Theatre 490: Dramatic Theory and Criticism. and the Aesthetics of the Theatre, 4 hrs.

All of the arts face a profound problem in the attempt to establish criteria which will enable creative activity to be evaluated. This class sets out to tackle that problem as far as the theatre is concerned. 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.

The Minor and Electives In selecting classes for the minor and electives, students should consider the following classes offered by other departments:

Modern Drama Time

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implementation in particular plays and in theatrical practice will also be examined.

# Theatre 460: Directing, 4 hrs.

The procedures that lead to theatrical events are analysed in this class. Specific and directorial theories are explored and tested. The work in the class involves directing scenes and at least one

# **Theatre 470: Special Topics.**

This class allows the student to explore in detail particular areas of the theatre which are of special interest, with the guidance of members of the faculty. Frequency and length of meetings will be decided to meet the needs of the particular topic or project under study. The class is open only to fourth year honours theatre students.

# Theatre 481: Acting III

An advanced class in movement and voice.

# Theatre 482: Acting IV, 6 hrs.

This class concentrates on production work. The advanced acting student will be evaluated on both preparation of role and performance. Production work will be supplemented by reading and analysis of contemporary theatre practice.

CLASSICS 207: Ancient Drama in Relation to **ENGLISH 214: Shakespeare** ENGLISH 220: English Drama **ENGLISH 226: Tragedy** 

**ENGLISH 227: Comedy and Satire** 

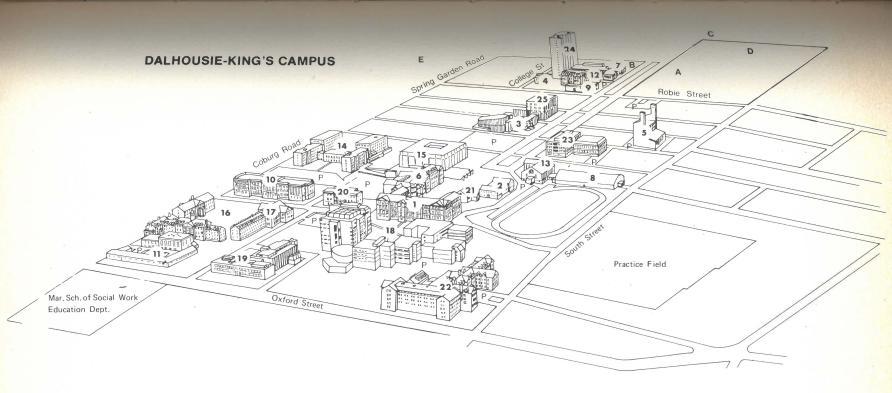
ENGLISH 252: Shakespeare and the Drama of His

**GREEK 302: Greek Drama: Tragedy GREEK 303: Greek Drama: Comedy** 



# LATIN 302A, B: Roman Comedy RUSSIAN 303: Russian Drama

**Graduate Studies** Graduate studies in theatre are not at present available at Dalhousie. Members of the depart-ment will be glad to help students with advice about opportunities for graduate study at other universities.



INIVERSITY HOUSES

### KEY IO MAR

1. Arts & Administration Bldg. 2. Arts Annex Arts Centre
 Pharmacy Central Services
 Chemistry and Macdonald Science Library 7. Clinical Research Centre 8. Dalhousie Memorial Rink 9. Dentistry 10, Dunn 11. Education 12. Forrest 13. Gymnasium 14. Howe Hall 15. Killam Library

16 King's College
17 King's College Gymnasium
18. Life Sciences Centre
19. National Research Council 20. Nova Scotia Archives 21. Law 22. Shirreff Hall 23. Student Union 24. Sir Charles Tupper Medical 25. Weldon Law P Parking Areas A Site of I.W. Killam Hospital B Site of Grace Maternity Hospital C Site of Halifax Infirmary D Site of Victoria General Hospital E Site of Camp Hill Hospital

1244 LeMarchant Classics Commerce 1239 Seymour Economics 6220 University 1460 Oxford Education 1355 LeMarchant German Government Studies 1226 Le Marchant 1435 Seymour History Institute of Public Affairs 6209 University Nursing 5963 College 6230 South 1400 Henry Personnel Philosophy Physiotherapy 6006 University Radiation Biology 6086 University 1376 LeMarchant Russian/Spanish Social Work 6414 Coburg 6034 University Transition Year Programme p - Parking Areas