## UNIVERSITY OF KING'S COLLEGE

## CALENDAR <br> 1973/74

|  | January |  | Mar |  |
| :---: | :---: | :---: | :---: | :---: |
| ‘73 | S M T W T F | S M T W T F | M T W T F | S |
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|  | $\begin{array}{llllllll}21 & 22 & 23 & 24 & 25 & 26 & 27 \\ 28 & 29 & 30 & 31\end{array}$ | $\begin{array}{lllllllll}18 & 19 & 20 & 21 & 22 & 23 & 24 \\ 25 & 26 & 27 & 28 & & \end{array}$ | $\begin{array}{llllll}18 & 19 & 20 & 21 & 22 & 23 \\ 25 & 26 & 27 & 28 & 29 & 30\end{array}$ | $\begin{array}{llll}22 & 23 \\ 29 & 34\end{array}$ |
|  | May | June | July | ${ }^{\text {Augus }}$ |
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|  | $\begin{array}{lllllllll}6 & 7 & 1 & 2 & 3 & 4 & 4 & 5\end{array}$ | $\begin{array}{lllllllll}3 & 4 & 5 & 6 & 7 & 1 & 2 \\ 9\end{array}$ | $\begin{array}{llllllll}1 & 2 & 3 & 4 & 5 & 6 & 7\end{array}$ | $\begin{array}{llllll}5 & 6 & 7 & 1 & 2 \\ 9\end{array}$ |
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|  |  |  | $\begin{array}{llllllll}15 & 23 & 24 & 25 & 26 & 27 & 28\end{array}$ |  |
|  |  | $\begin{array}{llllllll}24 & 25 & 26 & 27 & 28 & 29 & 30\end{array}$ |  | 26 27 28 29 30 <br>   December   |
|  | September |  | Novem |  |
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|  |  |  |  |  |
|  | January | February | March | April |
| 74 | S M T W T | S M T W T F S | S M T | M |
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|  |  |  |  |  |
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|  | Sepiember | October | November | December |
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|  | January | February | March |  |
|  |  |  |  |  |
| 75 | $\begin{array}{rrrrrrr} S & M & T & W & T & F & S \\ & & & 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 & 9 & 10 & 11 \\ 12 & 13 & 14 & 15 & 16 & 17 & 18 \\ 19 & 20 & 21 & 22 & 23 & 24 & 25 \\ 26 & 27 & 28 & 29 & 30 & 31 & \end{array}$ | $\begin{array}{ccccccc} S & M & T & W & T & F & S \\ & & & & 6 & & 1 \\ 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 & 13 & 14 & 15 \\ 16 & 17 & 18 & 19 & 20 & 21 & 22 \\ 23 & 24 & 25 & 26 & 27 & 28 & \end{array}$ | $\begin{array}{rrrrrrr} S & M & T & W & T & F & S \\ & & & & & & 1 \\ 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 & 13 & 14 & 15 \\ 16 & 17 & 18 & 19 & 20 & 11 & 22 \\ 23 & 24 & 25 & 26 & 27 & 28 & 29 \\ 30 & 31 & & & & & \end{array}$ |  |
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|  | May | $$ | July | Augu |
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|  | $\begin{array}{lllllllll}25 & 26 & 27 & 28 & 29 & 30 & 31\end{array}$ |  |  |  |
|  | September | October | November | December |
|  | $\begin{array}{llllllll}S & M & T & W & T & F & S\end{array}$ | $\begin{array}{llllllll}S & M & T & W & T & F & S\end{array}$ | $\begin{array}{llllllll}S & M & T & W & T & F & S\end{array}$ | $\left(\begin{array}{rrrrrr} S & M & T & W & T & f \\ & 1 & 2 & 3 & 4 & 5 \\ 7 & 8 & 9 & 10 & 11 & 12 \\ 14 & 15 & 16 & 17 & 18 & 19 \\ 21 & 22 & 23 & 24 & 25 & 26 \\ 28 & 29 & 30 & 31 & & \end{array}\right.$ |
|  | $\begin{array}{ccccccccc}1 & 2 & 3 & 4 & 5 & 6 \\ 8 & 9 & 10 & 11 & 12 & 13\end{array}$ | $\begin{array}{llll} 1 & 2 & 3 & 4 \\ 8 & 9 & 10 & 11 \end{array}$ |  |  |
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|  | 282930 | $\begin{array}{llllll}26 & 27 & 28 & 29 & 30\end{array}$ |  |  |

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During the appropriate registration period specified in the Academic Calendar, King's Arts and Science Calendar, 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. (Resident students will be assigned rooms.)


## Academic Calendar 1973-74

| July, 1973 | Thursday, 13 | Wednesday |
| :---: | :---: | :---: |
| Monday, 2 University h | Registration and payment of fees for returning full-time students and part-time students in the Faculty of Arts and Science. | First day of Atlantic School Recess. |
|  | Registration in School of Theology. | Saturday, 22 |
| Tuesday, 3 |  | Student holidays begin. |
| Last day for receiving applications for admission to the Faculty of Arts and | Classes begin Foundation Year Pr | Monday, 24 |
| Science from transfer students and those who do not meet the normal admission requirements. | Retreat for Theology Students. Saturday, 15 | University holiday. Tuesday, 25 University holiday |
| Summer School registration (2nd session). | Registration and payment of fees for parttime and special students in the Faculty of Arts and Science. | Wednesday, 26 <br> University holiday. |
| Wednesday, 4 <br> Summer School classes begin. | Retreat for Theology Students. | onday, |
|  | Sunday, 16 | University holiday. |
| Wednesday, 18 | Retreat for Theology Students. |  |
| Halifax | Monday, 17 | January, 1974 |
| August, 1973 | Classes begin in Arts and Science and in Atlantic School of Theology. | Tuesday, 1 |
| Wednesday, 1 | Sunday, 23 | University holida |
| 12 noon. Dartmouth Natal Day (University holiday). | University Church Service -Chapel-11 a.m. | Thursday, 3 |
|  | Monday, 24 First day for change of class or | Classes resume (regular and $F$ Year Programme). |
| Tuesday, 14 | First day for change of class or course. |  |
| Last day for receiving applications for admission to full-time study in the Faculty of Arts and Science. | Friday, 28 <br> Last day for withdrawing from course in the School of Theology. | Friday, 4 <br> Registration of new students. |
|  |  | Monday, $\mathbf{7}$ Classes resume in Atlantic |
| Friday, 17 <br> Final day of classes, Summer School. | October, 1973 | Theology. |
|  | onday, 1 | Friday, 18 |
| September, 1973 | Last day for adding classes (except "B" classes). | Last day for withdrawing from the School of Theology. |
| Monday, 3 | Monday, 8 |  |
| University holiday. | University holiday. | Monday, 21 <br> Last day for adding "B" classes. |
| Tuesday, 4 | November, 1973 | Thursday, 31 |
| Last day for receiving applications for admission to part-time study in the Faculty of Arts and Science. | Monday, 12 University holiday. | Last day for withdrawing from full "C" classes. |
| Monday, 10 | $\underset{\text { Friday, } 16}{\text { Last day }}$ | February, 1974 |
| Class and course approval, registration and payment of fees for new full-time students | without penalty. | Friday, 1 |
| admitted to the Faculty of Arts and | December, 1973 | Munro Day (University holiday). |
|  | Wednesday, 12 | Saturday, 2 <br> Dalhousie Winter Carnival |
| Tuesday, 11 <br> Class and course approval, registration and | Last day of classes (regular and Foundation Year Programme). | holiday). |
| payment of fees for new full-time students admitted to the Faculty of Arts and Science. | Thursday, 13 <br> Examinations begin. | Wednesday, 13 <br> Meeting of Convocation 8:00 p.m. |
|  | Mo | Monday, 25 |
| Wednesday, 12 | Evaluation day in Atlantic School of | Study break begin |
| Registration and payment of fees for returning full-time students and part-time | Theology. | March, 1974 |
| students in the Faculty of Arts and Science. Registration in School of Theology. | Tuesday, 18 Evaluation day in Atlantic School of Theology. | Study break for Divinity students. be announced. |

uesday, 30

Honday, ${ }^{11}$, 1 , day for withdrawing from "B" classes $\quad$ May, 1974
Wednesday,
Wednesday, 1 Lay for receiving applications fo
Last admission from foreign students (other than Americans).

Theology
Sunday, 12
11:00 a.m. Baccalaureate Service

## Wednesday, 15

Encaenia Day - King's Convocation - Arts and Science and Divinity.

Thursday, 16
Dalhousie University Convocation.

Friday, 17 Regular session ends.

## Monday, 20

Victoria Day (University holiday).
Tuesday, 21
Summer School Registration (1st session).
Wednesday, 22
Summer School classes begin (1st session).

June, 1974
Friday, 28
First Summer School session ends.

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: 1973-74

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

## $V_{\text {isitor }}$

The Nost Reverend the Lord Archbishop of
Nora Scotia and Metropolitan of the Ecclesi-
stical Province of Canada.

## Chancellor

$V_{\text {acant. }}$
President and Vice-Chancello
J. Graham Morgan, B.A. (Nott.), M.A. (McM.),
N.P. (Phil. (Oxon.), 6360 Coburg Rd., Halifax

## Board of Governors

The Mest Rev. W. W. Davis, B. A B.D. D.D.
D.C.L., (Chairman), $\quad 5732$ College Stree
Halifay

The Re, N.S.
M. Ret. Rev. H. L. Nutter, B.A., B.S.Litt.
Rh., D.D., L. L.

Brunsw wick Street, Fredericton, N.B.
The Rt.
The Rt. Rev. G. F Arnetd, M.B.
Sulfrean Bishop of Nova Scotia, 5732 Colleg
Street.
Dr. J. Graham N.S.
${ }^{6360}$ C. Graham Morgan, B.A., M.A., D.Phil be announced.

Professor H. S. Granter, B.A., A.M., (Vice-
President), 1171 Cartaret Street, Halifax, N.S.
Treside Francis, Esq., (Treasurer), Halifax Herald Ltd., P.O. Box 610 , Halifax, N.S

Diocese of Fredericton
The Ven. A. E. L. Caulfeild, B.A., L.S.T 50 Orange St., Saint John, N.B. (1975)
H. V. Frear, Esq., 116 Princess St., Saint N.B. (1975). The Rev.
N.B. (1973)
The Rev). No. 1, Bloomfield Station, N.B. (1973), The Ven. Raymond H. Murphy, B.Th., King Ave., Bathurst, N.B. (1975). Rev. F. H. Hazen, B.A., L.Th., Box 227 , Sussex, N.B. (1973).

Diocese of Nova Scotia
His Honour Judge J. E. Hudson, B.A., LL.B., D.C.L., Family Court, P.O. Box 1473, Halifax Nort P.O., Halinax, St. James Rectory, Herring Cove, Halifax Co N.S. (1973). $\underset{(1974) .}{\text { E. W. B }}$ (1974).

Harold Vincent, B.C.L., 830 McLean St., Halifax, N.S. (1974).

The Venerable L. F. Hatfield, M.A., D.D. P.O. Box 83, Truro, N.S. (1974) The Rev. W. A. Trueman, B.A., B.S.Litt., Charlottetown, P.E.I. (1973).

Alumni Association
Professor Innis Christie, B.A. LL.B. LL.M., 21 Bayview Road, Halifax, N.S. (1974) Robert J. Cram, B.A., Rum Point, Garden Lots, Lunenburg Co., N.S. (1974). John W. Fisher, LL.B., 170 Bay Street, Suite 203, Toronto 1 , Ontario. (10 D.D., 7 Fox Meadow Road, Scarsdale, N.Y. 10583, (1974). Rev. E. G. Harris, B.A., B.S.Litt., Lynn Drive, Dartmouth, N.S. (1975).
R. V. Swetnam, Esq., 6897 Tupper Grove, R. V. Swetnam, Esq., 6897 Tupper Grove,
Halifax, N.S. (1975). Her Honour Judge Sandra E. Oxner, B. The Rev. D. F. L. Trivett, B.A., L.Th., B.D., 1665 Oxford St., Halifax, N.S. (1975).

Faculty Representatives
F. H. Page, M.A., D.D., 1835 Rockcliffe St., Halifax, N.S. (1973).
The Rev. F. G. Krieger, B.A., B.D., 630 Francklyn St., Halifax, N.S. (1974)

Professor J. P. Atherton, M.A., Ph.D., 227 Purcell's Cove Rd., Boulderwood, Halifax, N.S. (1974). The Rev. Dr. J. B. Hibbitts, M.A., B.S.Litt., D.Phil., D.D., M.Div., STM., 1625 Preston St., Halifax, N.S.(1973).

Student Union Representatives
Blair Mitchell, James Fraser, David Nauss, Anne

Co-opted Members
G. R. K. Lynch, B.A., LL.B., Room 210, 5600 Sackville St., Halifax, N.S. (1973).
R. G. Smith, Esq., P.O. Box 2130 , Halifax, N.S. (1973).

The Very Rev. E. B. N. Cochran, B.A., L.Th. Ralph V. Creige St., Halifax, N.S. (1972). (1974).

Executive Committee
The Archbishop of Nova Scotia
The Bishop of Fredericton
The President
The Vice-President
The Treasurer
The Rt. Rev. G. F. Arnold
The Ven. A. E. L. Caulfeild
E. W. Balcom
G. R. K. Lynch
G. R. K. Lynch
R. G. Smith

Blair Mitchell
R. V. A. Swetnam
H. V. Frear

The Rev. R. B. Stockall
Prof. J. P. Atherton

Representatives on Dalhousie University Board of Governors
R. G. Smith

Representatives on the Governing Body of King's College School

The Very Rev. E. B. N. Cochran Prof. J. P. Atherton

## Governors Emerit

N.B.

The Rev. Dr. D.
Ceymouth, N.S. Corstorphine 1230-10040-104th Street, E.L., D.C.L., LL.D.

Secretary to the Board of Governors
Miss E. D. Horlock, M.A., 6411 South St., Apt 32, Halifax, N.S.

Officers of Administration

## President

J. Graham Morgan, B.A. (Nott.), M.A. (McM.) D.Phil. (Oxon.)
H. S. Granter, B.A. (Dal.), A.M. (Harvard)

Chairman of Divinity Faculty
The Rev. Prof. R. J. R. Stokoe, B.Sc., B.A.
Dip.Th., Th.M.
Director, Foundation Year Programme
W. J. Hankey, B.A. (Vind.), M.A. (Tor.).

Miss Allison Conrod
Registrar
Mrs. G. S. Clark
Mrs. J. E. Lane, B.A.
Executive Secretary Alumni Association
Mrs. J. Desrosiers
Dean of Residence
David Jones, B.A., M.A
Dean of Women
Mrs. Ena Gwen Jo
Director of Athletics R.N
R. Shoveller.

## Officers of Convocation

## Chancello

vacant.
Vice-Chancellor
. Graham Morgan, B.A. (Nott.), M 1.(0xon.).

Clerk
Harv.), M. D. Crouse, B.A. (Vind , W. Mrin.), Ph.D. (Harv.)
Chancellors of the University
The Very Rev. Edwin Gilpin, D.D Edward Jarvis Hodgson, D.C.L., 1897 ir Charles J. Townshend, D.C.L., The Most Rev. John HacKenle 937-1943.
Hon. Ray Lawson, O.B.E., LL.D. 1948-1956.
1956-1958.
H. Ray Milner, Q.C., D.Cn.L., D.C.L 1958-1963.
Robert H. Morris, M.C., B.A., M.D., 1964-1969.
LL.D., F.A.C.S., F.R.C.S.(C), 1971-19
President and Vice-Presidents University.
The Rev. Dr. William Cochran, 1789-1 The Rev. Thomas Cox, 1804-1805. he Rev. Dr. Georre McCawley, 183 The Rev. Dr. John Dart, 1875-1885. The Rev. Dr. Isaac Brock, 1885-1889 The Rev. Dr. Charles Willets, 1889-190 Dr. Ian Hannah, 1905-
The Rev. Dr. C. J. Boulden, 1905-190 The Rev. Dr. T. M. Powell, 1909-191 The Rev. Dr. T. S. Boyle, 1916-1924. The Rev. Dr. A. H. Moore, 1924-193 The Rev. Dr. A. Stanley Walker, 1937 The Rev. Dr. H. L. Puxdey, 1954-196 Dr. H. D. Smith, 1963-1969 Dr. J. Graham Morgan, 1970.

## lcademic Staff

Faculty of Arts and Science E. L. Heighton, B.Sc., M.A. (Dal.), Ed.D. J. Stolzman, B.A. (Oreg.), M.S. (Fla. St.), Ph.D. King ${ }^{\prime \prime}$ Fac
(1973.74)
f. P. Atherton, M.A. (Oxon.), Ph.D. (Liver-

Professor of Classics, 277 Purcell's
Boulderwood, Halifax, N.S
gor Dawson, B.A. (Trinity), M.A R. MacGregor (Oxon.),
(Tor).), isociait Professor (Halifax, N.S. (Sabbatical 1973/74).
s. G. Granter, B.A. (Dal.), A.M. (Harvard), H.S.G Granter, B.A. (Dai.), A.M. (Harvard),
Professor of History,
, 1171 Cartaret St., Halifax,
๗. J. Hankey, B.A. (Vind.), M.A. (Tor.),
W.J. Hanke, B.A. Director Finndailege, Halifax, N.S.
itry of King's
E. L. H
(Virginia),
Assistant

Assistant ${ }^{\text {Pr }}$ Professor of Math Assistant Professor of
Jubilee Rd., Halifax, N.S.
.
J. G. Morgan, B.A. (Nott.), M.A. (McM.),
oxon.),
of Sociology and Anthropology, 6360 Coburg Rd., Halifax, N.S.
C. M. Ouellette, B.A. (Maine), M.A., Ph.D. Clark),
Assistant Professor of Economics, 6 Sybyl Court, Apt. 15, Halifax, N.S. (Sabbatica
1973/74).
F. Hilton Page, M.A. (Tor.), D.D. (Pine Hill), rofessor of Philosophy, 1135 Rockcliffe St., Yesus, H. G., B.A. (Haile Sela Halifax, N.S.

Lennon, J.A., B.A., M.A. (Tor.)

Starnes, C. J., B.A. (Bishops), S.T.B. (Harv.), M.A. (McG.), (Illinois et Brandeis).

## Faculty of Divinity (1973-74)

The Rev. Canon J. H. Graven, M.A. (Dal.),
${ }^{\text {Lind. (Vind.), }}$, Department of Religion and
Paychiatry, Menninger Foundation, Topeka,
Kansas, Alexandra Kansas, Alexandra Special Lecturer in Pastor-
dia (Director of Parish Fide Dr, Jollimore, Halifax, N.S.

The Rev. J. B. Hibbitts, M.A., (Dal.), B.S.Litt.
N.Y.,.), D. Mhi. (O., S.T.M. (Gen. Theol. Sem, Prolessor of D. (Oxon.), D.D. (Pine Hill),
Halifiax, NS Biblical Studies, 1625 Preston St,

The Rev. F. G. Krieger, B.A. (Hobart), B.D ${ }^{(\text {tepis. Theol. Sch.), }}$,

Professor of
J. G.
D.Phil. (0xon,
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B.A. (Nott.), M.A. (McM.), Coburg Road, Halifax, N.S.

The Rev. R. J. R. Stokoe, B.Sc., B.A., Dip.Th. The (Durh.), Th.M. (Crozer), S.T.M., Chaplain Supervisor, Professor of Chaplain at the Victoria General Hospital, Regina Tema Chairman of the Faculty, 6189

The Rev. B. C. Strople, S.Th., A.K.C., Special Lecturer in Prayer Book Liturgics, Sackville, N.S.

The Rev. E. T. McKnight, B.A., B.D., (Acadia), Chaplain at the Nova Scotia Hospital, Dartmouth, N.S. and certified Chaplain Supervisor.
The Rev. Professor C. J. Taylor, B.A., B.D. (Acadia), S.T.M. (Andover Newton), D.D. (Vind.),
Professor of Clinical Pastoral Education of Chaplain Supervisor
Associates in Supervised Pastoral

The Rev. H. H. Taylor, B.A., B.D. (Acadia), The Institute of Pastoral Training, King's ,ge, Halifax N.S. and certified Chaplain

The Rev. K. H. Tufts, B.A., L.Th. (vind.),

## Historical Sketch

The history of higher education in Canada began in 1789 with the founding at Windsor,
Nova Scotia, of the University 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 was granted by George III proclaiming King's
College, Windsor, "The Mother of an University for the education and instruction of youth and students in Arts, 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 de-
stroyed 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 eventually erected on the campus of Dalhousie
University. In 1930 it entered into partnership 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 main-
tained joint faculties of Arts and Science, so that undergraduates of King's read for the B.A. and B.Sc. of Dalhousie. King's has left her own degree-granting powers in abeyance in these
faculties and now gives degrees in theology by faculties and now gives degrees in theology by
examination, together with honorary degrees in examination, toget
Divinity and Laws.

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.
King's College is residential, on the Oxford and Cambridge pattern, and, in addition to the day
students who live out, students who live out, 125 men and 100
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 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 co porate 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 examina-
tions. tions.
In addition to its athletic activities, the College runs a Debating Society, known as the "Quin-
tilian", 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
and incorporates facilities for the training of Anglican clergy, 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 them selves be resident and function in the tradi-
tional manner as "dons" for the staircase (i.e "onal manner as "dons" for the staircase (i.e, Middle Bay, Radical Bay, North Pole Bay Cochran Bay, and The Angel's Roost. Alexandra Hall is the residence for women.
Now that there are many large overcrowded universities which find it difficult if no
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 of the more superficial observances,
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 Student Union, six by
each of the Synods of Nova Scotia 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. Executive Committee.

Vice-Chancellonsists 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 and of the Faculty of Arts and Sci hold the degree of Master or Doctor
of Divinity; Fellows of the Unive
of Divinity; Fellows of the Univers
Bachelors of the University of five standing who are recognized by the Convocation. All degrees are confe Convocation.
The Faculties consist of the member teaching staff on the King's Foundatio Faculty of Arts and Science under th ment of Association with Dalhousie U and the members of the teaching Divinity.

## Faculties

Faculty of Arts and Science
The University of King's College ha an association with Dalhousie students registered in Arts and Sc classes jointly with Dalhousie student
classes are given by Dalhousie profes. classes are given by Dalhousie profe
professors on the King's Foundation, on the course taken. The student institutions follow the same curric he same examinations, and must same academic standard. The Un
King's College Foundation Year ing College Foundation Year P with the University of King's College.

## Faculty of Divinity

Studies in Theology are under the s of the Divinity School Council responsible to the Board of Gove most of the work is done in the Atlantic
of Theology under the direction of of Governors and the Senate of that cumenical partnership institution of ersity of King's College, Pine Hill Di United Church) and the Roman
Archdiocese of Halifax. Degrees and in Theology are a warded to candidate the necessary academic requirements, of religious denomination or sex. St also prepared to meet ordination re Study for these candidates is subi Bishops in the Dioceses of Nova Fredericton.

Cxemptions Granted to College by Other Institution
The University of Oxford exem Responsions an undergraduate in A second or a higher year. A Bachelo with Honours is further exempted

Rules governing residence life are contained in the "Regulations" handbook. Students will be expected to sign a statement acknowledging receipt of the "Regulations" of the University and a statement of their acceptance of these

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

## King's College Library

King's College Library was founded in 1789. Just after the Royal Charter was granted to the 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 most of 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 such small library.

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 contines 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 up to date. The John Haskell Laing Memorial Bequest helps with the purchase of books in this field.
hboratories regularly to and punctually and to

Book purchases in the general field are aided by
-
chapel life afforded by the University tudents are invited to attend them. The service are announced at the beginning session and, whie in the services in the students of all denominations are students encouraged to attend. There is a and evening service every week day the evening meal on Wednesdays is a nion Service with music, and is regarded thing of "a College Corporate Com
iversity Chaplain is available to al and conducts discussion groups for al Discipline
ntenance of discipline is in the hands of lege Board which is composed of the
the Dean of Residence, the Dean of three students, President of the StuUnion, Chairman of the Men's Residence Women's House President, two prothe King's Foundation chosen Divinity chosen annually by the The students exercise a large measure overnment in maintaining good orde ing themselves in an unbecoming within the precincts of the college,
fined, suspended or expelled. When a ined, suspended or expelled. When
with the traditions of the College, are expected to wear gowns when calling upen seated for formal meals, President of the calling upon the President of
Gowns may be obtained from the omen.

## Degrees and Courses

The degrees of Doctor of Divinity and Doctor of Civil Law, may be conferred honoris causa in recognition of eminent
fessional or public servic

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.

Convocation confers a Bachelor of Divinity and Associate of Theology (on recommendation of the Board of Examiners of the General Synod of the Anglican Church of Canada), the Master
of Divinity and Bachelor of Theology on recommendation of the Senate of the Atlantic School of Theology, and the Master of Sacred Theology in Pastoral Care on recommendation of the Graduate Studies Committee of the Institute of Pastoral Training. Convocation also
awards the diploma of Associate of King's College (Nova Scotia) and may, in applicable cases, award a Testamur.

Pre-professional work in Arts and Science by students intending to enter one of the Dalstudent of King's College.

Haskell, James Stuart Mantelh, Frances Hannah Henry Hunt (Alumni Memorial).

The library is open Monday to Friday from 9.00 a.m. to 5.00 p.m., and 7.00 p.m. to 10.45 p.m. On Saturdays the hours are 9.00 a.m. to 12.00 noon. On Sundays $2-5$ p.m. For part of
the session the reading room will be the session the reading room w.

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

Fines will be charged for overdue books at the rate of twenty-five cents a day for seven day books.
Students are given the privilege of borrowing
books for the summer.

Dean of Residence
Mr. David Jones
Dean of Women
Mrs. Ena Gwen Jones
Dons
Judith Campbell Mark DeWolf
John Godfrey Wayne Hankey

Allan Lennon o Ann Radbo
Hagos Yesus Hagos Yesus

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 or lodging outside the university.
All students registered at King's College are guaranteed residence accommodation should they wish it, on completion of the form for
application for accommodation, and subject to the approval of the application by the Dean of Residence (for men) and the Dean of Women (for women).
Male students live in the men's bays (Chapel, Middie, Radical, North Pole, Cochran and The supervision of the Dean of Residence. Female students live in Alexandra Hall, a residence accommodating 100 women, under the supervi-
sion of the Dean of Women, sion of the Dean of Women.

All rooms are furnished with bed, dresser, desk, nd chairs. Students are required to provide heir own bedding and towels, and to attend to washing and drying equipment is provided in both men's and women's residences.
Single and double rooms are available to bot nen and women, priority for single room
he residences have been designed to provid for the comfort and convenience of the students, and to facilitate study. In the men's esidence, two students occupy a suite of two rooms (bedroom and study). The common the Haliburton Room, a gathering place for all students and the site of many student activities.
The Women's residence was built in 1962 and is nodern in every respect. It contains, beside library, reading rooms, lounges, a service ele vator and ample storage space.
Both residences are designed so that it is no necessary to go outside for meals and extra curricular activities.
Meals are prepared and served to all residen students in Prince Memorial Hall, erected in
1962 . 1962.
expected accepted in residence by the Deans are the case of withdrawal during the session, must obtain substitutes satisfactory to the Dean. All
residents will be charged with complete session and will be liab charge unless or until a substitute h student may withdraw from the ba without notice to the Dean.
It should be noted that the Unit
ho liability for personal property in heft or damage.
The residence will be open for new from the evening of September 9,197 December 22,1973 , and from the anuary 2,1974 , to the morning of 1974. (Students not in their graduat will be expected to vacate the re ours following their last examina hese periods may reside whose te hese periods may reside in the and, when Prince Hall is open, meal eaten by arrangement with the Steward.
Confirmation of accommodation made until the student has been a 50.00 residence deposit has been re he Business Office. Deposits for all ions made prior to July 15 th must be by that date. Applications for residenc modation made after July 15 must be panied by the $\$ 50.00$ deposit. Cancell appication received by the Registrar student to a refund of the $\$ 50.00$ de

$$
\text { . } \$ 50.00 \text { depos }
$$



Alexandra Hall in a Winter Setting

Fees must be made in Canadian funds by negotiable cheque. Please make cheques to the amount.

## Residences

e session is defined for students
e session is defined for students
in the faculty of Arts and Science in the faculty of Arts and Science
tudents registered for the Atlantic of Theology as being from the first day registration (including Sunday, Septuntil the day following the last
and scheduled examination in the Faculty
Science (for students in this and Science (for students in this
and in the Atlantic School of Thestudents in this School). The annual these periods for board, light, meals

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& \text { r thene pel } \\
& \text { follows }
\end{aligned}
$$

$\begin{array}{ccc} & \text { Double } & \text { Single } \\ \text { idence } & \$ 1010.00 & \$ 1055.00 \\ \text { Residence } \\ & 1010.00 & 1050\end{array}$ Ne's Residence
Noments Residence Residence
Residence (Suite)
(suite) 1160.00
uating resident student may stay in
without charge after these periods cee without charge after these periods up
including the last day of Encaenia but will be expected to pay for meals luring this time.

In exceptional circumstances a student may seek pe:mission of the Dean of Residence to occupy a room at times other than those
specified above. For charges and conditions students
Residence. above. For charges and conditions
should consult with the Dean
residence must make a deposit of $\$ 500.0$ at commencement of the first term,
the balance of the bill to be paid in the balance of the bill to be paid in January,
New students are expected to deposit $\$ 50.00$ en pre-registering and returning students len pre-registering and returning students
0.00 before April 15, increasing this deposit to 850.00 by July 15. The room deposit will be refunded only when notice of cancellation of odation has been received by the or the Deans before August 15
students as well as non-resident, must lowing at commencement of the firs
tudent Body Fees $\$ 40.00$, Gow and any tuition fees payable to the of King's College. (Gowns for non dents are optional.)
is not paid within 21 days of
day a surcharge of $3 \%$ will be d a further $2 \%$ for each additional yable by non-resident students.
ayable by non-resident students.
and surchar residence fees are due in January Hary 25 .
ention Deposit
ment each resident student is required
a deposit of $\$ 25.00$ as caution money
o cover damage done to furniture, etc. This mount, less deductions, will remain a credit on the books until the student graduates or leaves,
when the balance will be returned by cheque usually during June. No refund in whole or in part will be made before that month. All students in residence are held responsible for
the care of furnishings within their respective rooms. Losses or damages incurred during the session will be charged to the caution deposit.

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

The items above, together with a key deposit $\$ 5.00$ are payable at King's Business Office.

## Tuition

Faculty of Arts and Science
King's Students $\$ 680.00$.
lst instalment $\$ 445.00$.
2nd instalment $\$ 240.00$.
The above charge includes class fees, laborator fees, library fees, examination, diploma and registration fees, instrument rental and hospital
clinics where applicable. clinics where applicable.
Incidenal Fees are collected for the Students' Union.

Part time students (These charges include incidental fees of registration and library only):
Students registering for three credits or less, one full credit class $\$ 150.00$
Students registering for one-half credit class $\$ 75.00$
$1 / 3$ credit class $\$ 50.00$
Audit students (This charge does not entitle students to any privileges other than attendance at class);
Students not candidates for University credit who wish to take one University lecture class because of their interest in it. No credit or
official transcript will be issued to such a official transcript will be issud
1 full credit class $\$ 75.00$
$1 / 2$ or $1 / 3$ credit class $\$ 37.50$
(A student enrolled at King's is required to pay
the King's Council of Students' fee of $\$ 40.00$, the King's Council of Students' fee of \$40.00, or the Rink and Athletic Field fee. However, any King's student who wishes to participate in the Dalhousie Council of Students' activities must pay both of the above Dalhousie fees. Dalhousie students resident at King's College
must pay King's College Council of Students' must pay King
fee of $\$ 40.00$ )

Faculty of Theology
Full-time students, basic course
Full-time studentsts, basic
$\$ 350.00$
$\$ 575.00$

Part-time students for each semester course below Master's level ............... $\$ 40.00$ Part-time students for each semester course at
Master's level ........................ 80.00 Arts and Science courses, when necessary A.K.C. Registration . . . . on application \$10:00 A.K.C. Examinations: per paper to be paid by A.K.C. Examinations: per paper to be paid by
the preceeding December 1, and non-refundable . $\$ 5.00$

Regulations for Payment of Tuition Fees

Payment of tuition fees for Arts and Science students is to be made to Dalhousie University Business Office. Please note that cheques are to be made payable to Dahousie University. A charge of $\$ 5.00$ is made for any cheque returned for he bank and pelow for Post-dated cheques cannot be accepted.

Full-Time Students
Students registered for more than three credits.

## Payment

Fees are payable in full on registration or in two instalments. The first, payable at registration, including incidental expenses, the second instalment, on or before January 25
A carrying charge of $\$ 5.00$ is added if fees are not completely paid at registration. Registration is not complete until the first instalment is paid.
The Dalhousie Business Office does not issue bills for tuition fees; the receipt issued at registration will show the balance, if any, which is outstanding.

Students planning to pay the first instalment of fees from a Canada Student Loan should apply funds will bence as early as possible oo the

Penalties for Late Payment
Students unable to pay the first instalment due for fees may register conditionally. A penalty of $\$ 5.00$ per day, to a maximum of $\$ 20.00$,
commencing on the first business day following the regular registration day, will be charged. To accounts outstanding after October 1, an additional charge of $8 \%$ interest from October 2 will be added.
Penalty and interest charges will be waived for students paying accounts from will be waived for students paying accounts from provincial loans
who pay by October 31 and give evidence of having received the loan from the province. Students who produce evidence that their application for a provincial loan had been rejected and pay accounts by October 31 will
.
also have penalty and interest charges waived.


Students who receive payment or notification of rejection of application from the province days may have the penalty charges wain seven interest will be charged from October 1. Proof must be provided to the Awards Officer that an application for a provincial loan was made prior to August 15 and that payment or notification of rejection of application had not been
received by October 31

Interest at $8 \%$ will be charged on second instalments outstanding after January 25. 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 - Students registered for three credit classes or less. Fee must be paid
at registration.

AUDIT STUDENTS
Students auditing lecture class for interest only with no credit issued. Fee must be paid at registration.
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 for tuition fees. The student should enquire at the Bursar's Office to ascertain if the Dalhousie Business Office has been informed of the arrangement.

## Late Registration

students are required to register on the regular registration dates as shown in the Academic
Schedule. Late registration requires the approval of the Registrar, and payment of an xtra fee not to exceed $\$ 5.00$ per day, to a maximum of $\$ 20.00$.
Diplomas
Diploma Fees are payable at registration in the
final year of the course, final year of the course
A.K.C.,., Testamur.
B.D., A.Th.
$\$ 12.00$
20.00
20.00
40.00

## Examinations

 An application for examin ed by the proper fee: At an outside centre (each - extra) .... \$15.00 (Application for re-marking w.m.... \$ 3.00 writing to the Registrar within three month in the date of the examination) If application for refund of supplemental examination fee is not made on or before July -

## Degree in Absentia

A graduating student must notify the Registrar prior to May 10 if not planning to be present to
receive a degree. If this notification is not given receive a degree. If this notification is not given
and the student does not attend the graduation ceremony, a charge of $\$ 10.00$ is required to be paid to the University (to Dalhousie for Arts
and Science students) to cover additional costs before the degree is released.
Library Fee Divinity students who are not registered for any Arts courses must pay a
Library fee of $\$ 5.00$ to King's College Business Office.

## Transcripts

A student may receive only an unofficial transcript. Official transcripts will be sent at a
student's request to other univerition business organizations. An application for a transcript must be accompanied by the proper fee. First transcript, no charge; additional copies, each original, $\$ 1$; extra copies, $\$ .50$
each. No transcript will be issued until all charges owing to the university have been paid in full.
Student Photograph
At time of first registration at King's each student will be required to supply two pictures
Laboratory Charge office upon the presentation of

Students with motorbicycles ing permits under the same charge of $\$ 2.50$, and will be them in a designated area.

## Refund of Fees

A student who has completed re proval from the Regust obtai King's.

A student withdrawing after two the date of commencement of charged in full for the incidental f receive a refund of the balance
tional basis, calculated in charge will be made for the monthl charge will be made for the month
withdrawal is approved includin withdrawal is approved, including
December. A student withdrawin will be charged the full first instal A student changing before Feb full-time to part-time status, with of the Registrar, will be eligib adjustment in fees for the remai session.

A student who is dismissed from th for any reason will not be entitled of fees, either academic or residen

Applications for a refund or adjust after the to the Business Office been obtained. N.B. - King's Coll must report AS WELL to the B College.

Fee For Student Organizations At the request of the King's student of $\$ 40.00$ is collected on enrolment
student who takes more than one student who takes more than one
entitles the student to the privi entiles the student to the privil
various students' organizations and copy of the King's College RECORD.

## versity Regulations

e required to report their local attending the University, to the Registrar, on or before October
nt changes must be reported


Lence of Students:
se of admission to the University
rsidence of a student is the place domiciled. This is normally prebe the place (country, province, etc.) te the home of his parents or guardian is hat place remains unchanged unless that satisfy the Registrar that he

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

## Discipline

If a student is required by a Faculty to discontinue attendance in the Faculty solel because he has failed to maintain the required dismissed on grounds of general discipline and dismissed on grounds of general discipline and
his right to be considered for admission to another faculty is unaffected.
When the work of a student is unsatisfactory or his attendance is irregular without sufficient classes, or from the University

No return of fees will be made to any student dismissed from classes, residence, or from the University.
alhousie Libraries
King's students enjoy the same privileges in the Dalhousie Libraries as Dalhousie students. For regulations and hours see the current Dalhousie calendar.
Other Librarie
Arrangements can be made for King's students to use the Halifax Public Library, the Nova
Scotia Technical College Library, Pine Hill Scotia Technical College Library, Pine Hill
Library and the Provincial Legislative Library. Conferring of Degrees

Successful candidates for degrees are ordinarily equired to appear at Convocation in the proper academic costume to have the degree conferred have his degree conferred in absentia by giving formal notice to the Registrars of Dalhousie and King's before May 10.

## STUDENT SERVICES AND

## STUDENT AFFAIRS

Student Employment
The Department of Manpower and Immigration, Manpower Division, in co-operation with Me University, maintains a year-round Canada 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 and Dining Hall.

## Student Counselling Service

Students worried or anxious about 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 proble
service to students.

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

## University Health Service

The university (Dalhousie) operates a serviee ad a small in-patient infirmary
Further 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. This applies particularly to residents of any provine quiring a premium for Medicare Insurance.
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 Medice be paid by him/herself or family.

In 1972 regulations were changed regarding eligibility for persons entering Nova Scotia. It is essential that all such persons contact the
Health Service for advice as to their insurance status as the University cannot assume re. sponsibility for accounts accrued for services to uninsured parties.
Registration Requirements

1. All students registering for the first time at 1. All students registering for the first time at
the University may be required to submit a certificate of health. This requires a physical examination by the student's personal phy sician and his completion of a Student History form provided by the University Health Service to each applicant.
2. All returning students are required to complete an annual medical questionnaire at the time of registration. Those who have been out for a year or more for any reason may be required
above.
3. Other examinations may be required of all students who are found on admission to be in
low medical category, and also of students participating in major sports.

All information gained about a student by the Health Service is confidential and may not be released to anyone without signed permissio by the student.

## Tuberculin Tests

The tuberculin tests and reading is a require ment for registration for all students attendin King's for the first time and all students one or more years.

Those who do not complete this requirement will not be fully registered and will be required to pay the fee for late registration
The effectiveness of such precautionary measures is reduced very considerably unless every student included in the testing pro-
gramme is tested. The co-operation of students gramme is tested. The co-operation of student
in this simple and harmless test is vital to the welfare of the entire student body

## Emergency Treatment

In the event of a medical emergency student should tele
$424-2171$.
Other Services
services or requirements may be an nounced at the time of registration.

The University Health Service does not provide the following:
(a) Medical or Surgical care other than that provided by, or arranged through, the Univer sity Health Service.
(b) X-ray or Laboratory service, except a (c) Medications. (Prescriptions, druse d) Dental treatment
(e) Treatment for illness attributable to mis(f) Eyeglasses and examinations for (g) Pre-existing diseases.

Note:
The University Health Service will not pay cludints for hospital or medical service, including x-ray, laboratory service, rendered off-campus except in emergency cases or wher prior approval was received.
rescriptions
Medications prescribed by Health Service physicians or consultants to whom the student is referred by the Health Service are paid by a prepaid drug plan operated by the Student
Union. All other prescriptions student's expense.

Health and Physical Education
All students in their firs the University are encouraged to participate in ome form of physical activity. Activitie encing, soccer, badminton, volleyball, swim ming and hockey.

## Non-Academic Student Activities

Students representing the College in nonacademic activities must be in good standing Those who are ineligible for such representation re as follows
(a) Students on probation in any Faculty
(b) Students registered for few lectures per week, a period of two
hours being regarded for equivalent to one lecture. (c) Students who have more than
in college subjects.

These regulations do not apply to the
Canadian Armed Forces

## Subsidization Plans

The Regular Officer Training Medical Officer Training Plan (MOT Dental Officer Training Plan (DOTP) pletely subsidized university pla tuition, books, medical services, and summer employment for up t
of undergraduate study. Successf serve as commissioned officers in the Armed Forces for varying compulso after graduation.
For further information on above dents should contact the

Canadian Forces Recruiting and Select Sir John Thompson Building, 1256 Barrington Street
Halifax, Nova Scotia.
Phone: $422-5956$ or 423
Phone: 422-5956 or 423-6945.
Children of War Dead (Educatio
Childre of War Dead (EDeation
Act) provides fees and monthly allo children of veterans whose death was able to military service. Enquiries s directed to the nearest District

drission from High Schools in Nova

University Preparatory Programme. They should read the sections of the Calendar headed Degree Programmes and Programmes of Study, and in particular, the description of th first-year programmes. Many departments make
suggestions about high school preparation in 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 counsellors
in high schools can also offer advice on the in high schools individual high school pro grammes. Another source of advice is the Registra's Office, which will arrange inter views, whenever possible, between prospectiv tudents and members of the Faculty.

Admission from Outside Nova Scotia at Senior Matriculation Level

## Deadlines for Receipt of Applications

Applications for admission from any part of Canada or the USA must be r
Registrar's Office by August 15 .
Applications from all other countries must be received by May 1 (Students from Great qualifying examinations in June may request an extension of this deadline if they can ensure that their examination results will be available o the Admissions 1 Ihe by August

Application procedure and ways of appraising applications: as for students from Nova Scotia.

Equivalences
The following levels are considered equivalent to Senior Matriculation (Grade XII) in Nova Scotia:

Other Provinces of Canada
(a) Newfoundland: first year Memorial Univ sity.
(b) New Brunswick: the former Grade XIII; or first year at a recognized university or junior in New Brunswick public high schools.*
(c) Prince Edward Island: first ye
University of Prince Edward Island.*
*Note: Students from New Brunswick and Prince Edward Island who have high marks (i.e.
averages of $80 \%$ and above in five subjects including English) in Grade XII in those Provinces may apply and
(d) Quebec: Senior High School Leaving Application Procedure Office, or from most high schools) to the
Regitrar, King's College, as soon as possible ifter January lst, and normally not later than
lupust 15th. To complete the application, a ate must provide:
of successful completion of and XII in the University Pre
Programme (Senior Matriculation from a public high school in Nova record-transcript, Provincial EX ertificate, or Principal's report;
(
apli to in other respects will be refused ow. On the other hand, high scores ts may be taken as a factor in a
admission will be made known to through our joint admissions office
King's) as soon as possible after ntials have been received and 1 minimum requirement for admisss College is completion of Province
tia Grade XII examinations in the otia Grade Pry Programme, or the
Preparatory high school examinations, or ProvScotia Grade XII examinations, or the current year. However, the Office does not apply criteria . It has discretionary power to , but who appear acceptable on documents will be considered for

Early Admission
Sudents who have been receiving good marks eral average of $65 \%$ or more) may be Mor admission while still in their d to apply early in their last year a
for admission
for admission to the Faculty of Arts must submit a completed Applicah. To complete the application, a provide
programme; or first year of university Collegial programme.
(e) Ontarin: Grate XHI (Seco Sa Honour Graduation Diploma)
(f) Manitoba, Saskatchewan, Alberta: Grade
(g) British Columbia: the former Grade XIII; or first year at a recognized university or junior in British Columbia public high schools.

Other Countries
(h) 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 lesser standing will be considered if they appear basis of CEEB scores or advanced placement work.
(i) 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.
(j) Hong Kong: GCE as for Great Britain; or University of Hong Kong Matriculation ficate under same conditions as for GCE.
(k) India, Pakistan: Bachelor's degree with first- or second-class standing from a recognized university; or in certain circumstances, firstclass standing in the Intermediate examinations in Arts and Science, provided the candidate has passes at the university level the English.
(l) Countries not mentioned above: Write to the Registrar's Office.

Transfer from other Colleges and Universities

## Deadlines for Receipt of Applications

Canada and the USA: August 14
Other countries: May 1

## 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 at tended;
(c) Copies of calendars (or similar publications) of all colleges and universities attended;
(d) Certification of proficiency in English the native language of the applicant is anothe language


 .
(e) SACU or CEEB scores.

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

Transfer of Credits
Students who have attended a recognized junior college, or in Quebec a CEGEP or a two-year university Collegial Programme, and can present
satisfactory certificates may be granted Senior satistactory certificates may be granted Senior
Matriculation standing. 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 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 level below that of Senior Matriculation (Nova

Scotia) may with satisfactory documents pre
sent five appropriate university credits in lie sent five appropriate university credits in lieu
of Senior Matriculation subjects in order to meet King's entrance requirements. Students from such a university who produce satisfac tory certificates for more than five subjects, purposes and other credits for matriculatio Classes, within the limits of the Regulations set out below. Students who have attended another recognized university to which they were admitted from a level equivalent to that of Senior Matriculation (Nova Scotia) may, on presentation of satisactory documentary classes, within the limits of the Regulations set out below.

General Regulations Concerning Transfer (See also General Faculty Regulations)
ity who stadent from another college or univercollege or university on academic grounds will not be admitted to King's.
b) No transfer credit will be granted for any
equivalent) was obtained, or for which a final mark was granted
(c) To graduate from King's, all important part of a student's acade must be done here. This is interpreted at least five full classes, of which at
are in the candidate's are in the candidate's area of spe
(normally classes taken at secon higher).
(d) A student in a King's honours must attend King's as a full-time stud last two years unless special permis contrary is obtained from the C Studies.
(e) No classes taken at another ins
be counted towards fulfilling the be counted towards fulfilling the co requirement of the general Bachelo
the principal subject requirement of programme without specific appro departmentst concerned at Dalhousie.
(f) Transfer credits may be granted classes equivalent to classes offered and only in subjects recognized

The ordinary first year programme consists of

The King's alternative first year programme, the Foundation Year Programme, is a first year programme for both general and honour the Foundation Year Programme do one clas 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 classes,
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 graduation may be admitted as Special Students
into the Foundation Year Programme equivalent to four credits), successful completion of 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

## Foundation Year Programme

## Introduction

The University of King's College, in association with Dallousie University, offers a special Poundation Year Programme in the first year of
the Bachelor of Arts and
 proved a successful way of providing an
integrated and interdisciplinary course for first integrated and interdisciplinary course for firs
year students. A part of the offerings of the yar students. A part of the offerings of the
Dalhousie-King's Faculty of Arts and Science, the Programme is open only to students resitered at King's.
The Foundation
upproch to
Litertw
dation Year Programme is a ney to the first year of University. philosophy, political and social
s, the history of science, economic ligion, art and music are studied in one course in an integrated manner Which ses them as interdependent elements in hie developn
morement is
tion is understood through the examina me of the most basic works in our o learn to deal with these works is to
$\qquad$ 4 and sociation for studies in the humaniUnception of the nature, just as to have a To pre is to have a basis for thourghtful living Programme
these is the aim of this new
Hany scientists
the re acutely aware of the need to erelation of science to other
aspects of culture and to social life; a stream of
the Programme will provide a general view of
he Programme will provide a general view of
our culture for science students interested in these questions.

The form of the teaching is designed to mee the special problems of first year students. Students spend about equal time in lectures and
tutorial groups. 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 both permits the course to offer a wide variety of experiences and allows 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. A large number of departments recognize the Programme as a subsitute for their introductory class, this gives Foundation Year

The instructors in a wide variety of university subjects. All take the view, however, that first year study at university can profitably be devoted to tempts rather than to premature specialization in particular subjects. On the basis of the integrated view which a student can develop in the Foundation Programme, choice of greater specialization for subsequent years at university

## Teaching Staff

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

## R. D. Crouse, B.A. (Vind.), S.T

M.Th. (Mrocie Profeseor of Carvard)
H. V. Gamberg, B.A. (Brandeis), Ph.D. (Princeton),
W. J. Hankey, B.A (Vind.), M.A. (Toronto), Director, Foundation Year Programme. J. G. Morgan, B.A. (Nottingham), M.A. McMaster), D.Phil. (Oxford), Associate Professor of Sociology,
President, University of King's College.
M. Reckord, B.A., M.A. (Manchester), Ph.D (London),
Associate Professor of History.
D. H. Steffen, Ph.D. (Goettingen),

Associate Professor of German. Ph.D. (Oregon),
Assistant Professor of Sociology
J. A. Lennon,
C. J. Starnes, B.A. (Bishops), S.T.B. (Harvard), M.A. (McGill),
Junior Fellow.
H. G. Yesus, B.A. (Haile Selassie), M.A. (Illinois et Brandeis),
Junior Fellow.

Occasional Lecturers (1972-73)
J. Farley, B.Sc. (Sheffield), M.Sc. (West. Ont.) h.D. (Man.),
E. Ge Professor of Biology
E. Gesner, B.A., B.Ed., M.A. (Dal.)

Assistant Professor of French.
Assistant Professor of History
o. Sewell,
nt Professor of Art History, Nova Scotic R. E. Schliewen, B.A. bilt),
Assistant Professor of Sociology

## Admission Requirement

The admission requirements are those pertain ing to the Faculty of Arts and Science i students of every level of attainment However applications are invited from students completing junior matriculation (N.S. Grade XI) these students will be individually considered for admission without senior matriculation
(N.S. Grade XII) All students the three year gerel of for yed degrees.

## Scholarships

Students of the Programme are eligible for the scholarships open to entering students. In
addition, the Henry S. Cousing Stulathin $\$ 1,000$. and $\$ 750$. per year students entering this Programme.

## Grading and Credit

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

Successful completion of the Programme will give students in the Bachelor of Arts course twenty-four credit hours or four class credits toward the Bachelor of Arts degree. These
students do one other class besides the Foundation Year course to achieve a complete first year. Bachelor of Science students will do two science classes in addition to their work in the
Foundation Year Programme. The course for
i.e. three class credits.

Upon successful completion of the Programm
the normal departmental he normal departmental requirement of passing an introductory course in the discipline ments;

Cassics (except in the case of courses in the classical languages)
English Language and Literature
German (except in the case of courses in language)
History.
Political Science
Sociology (except for courses in Anthropology).
In addition the following departmental provisions have been established:

## Economics:

a) successful completion of the Foundation Programme is regarded as adequate prerequisite Economics 100 is not a prerequisite.
b) students intending to enrol in Economics courses for which Economics 100 is a prere quisite must have passed Economics 100A, (the Geruirement of Economics 100 B being waived) German:
of the Foundation Pr German 221 .
Philosophy:
rcesstul completion of the Foundation Pro gramme may be regarded as a substitute for
Philosophy 230 . Philosophy 230
The Department of Education of Dalhousie University waives its requirement of Englis tegrated Courses who have successfully. In pleted the Foundation Year Programme. Pre-Professional Training The Faculties of Medicine and Dentistry o Dalhousie University have approved the pre-professional work they require for admis on to their respective faculties. Students may substitute the Programme for the appropriate requirements laid down by these facultie
Course Designation, Lecture and Tutorial Hours.
he formal designation of the Programme courses is as follows:
King's Interdisciplinary Studies
K100 (Arts): Foundation in Social Science and 11:30 arranged.

K110 (Science): Foundation in Social Science and Humanities; Lectures M. W. F. 9:30 a.m. 11:30 a.m.:.
Outline of the Foundation Year Programme

The course has its own logic; it is not just 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 work
kinds, some of the most crucial culture. These we consider no discipline ordinarily studies them look, for example, at Mozart's Don early Greek urns, Michelangelo's and Brooklyn bridge; these are usua
stood to belong to the disciplin archaeology, art history and archit read Homer's Iliad, Shakespeare's Robert Penn Warren's All the
works usually studid works usually studied by the dep
classics, theatre, and English classics, theatre, and English liter
analyse Meditations, and Luther's The Fre Christian, which are usually studie ments of philosophy, theology and study Huizinga's The Waning of Ages, Rousseau's Social Contrac belong to history, political theory and sociology. We read selections nicus' On the Celestial Sphere Optics, Darwin's On the Origin of texts taken from the history of physics and biology

The logic we develop to integrate th stances of these various works is of On the one hand, we see how ea or stages shows the nature of the differ civilizations bre culture and how ea ing. On the other horm the institutions, ideas and movements thr of the historical periods.
The following are the teaching units ourse. One or more of the aspects o mit in with the diferser general character of each.

The Ancient World: The origin primary institutions and beliefs of the wanif in Greece, Rome, and Israel manifesting itself in art, myth and in o-ordinator: Mr. Atherton.
2. The Medieval World: The form hristendom. The forms of the City developed in the assimilation of ancient o Christianity provide the elements
consideration of this period. We atte rasp their unity, as the medieva through the Divine Comedy of ordinator: Mr. Crouse.
3. The Reformation and Renaissan break up of the medieval worl opposition of faith and nature. We
consider philosophy, secular arts in general, as self-co dependent of the Church and atte chieve secularly what it proclaimed o-ordinator: Mr. Hankey.
4. The Age of Reason: The enlig secularization to the the religion


Awarding the Governor General's Medal, Encaenia 1973

Special attention is paid to political theory i
this section. Co-ordinar: Co-ordinator: Mr. Steffen.

Triumph of the Bourgeoisie: Bourgeois cullure from its of triumph in the French Revolu-
lion to lion to its collapse in World War I. The He revoluthions: century is mainly treated in terms of erevolutions: political and industrial. Mar le a new form of literary experience. ator: Mr. Morgan.

Curtemporary World: From the decline e European empires to contemporary trial society. The focus is the point of our investigation of the nineteenth The revolutions of the twentieth e considered central. Co-ordinator:

One major paper will be required of both Arts and Science students during each unit. In addition, Ars stulating to the work of their
smaller papers relating Thursday lecture. This additional lecture will consider one text or topic in detail during the whole unit. A different kind of work will be considered in each period so that instruction is given in the different techniques appropriate to literature, phlosophy, history, etc. As the mark performance, no student will be able to pass the course without completing the written requirements.

The following are the recurring general topics which are discussed in each of the units outlined above.
a) Political institutions, the modes of au hority, conceptions of law and the person, the (b) Theological and philosophical positions and forms.
c) The conception of nature and forms o natural science.
(d) Economic institutions.
(e) The structure of society

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

There follows a synopsis of the course showing the relation of the above general topics and the various units.

| Historical Outline | From the Iliad to the beginnings of Christianity | From the "Dark Ages" to "the Waning of the Middle Ages:" circa 1500 A.D. | From the end of the Middle Ages to circa 1650 | The "Age of Reason" from c. 1650 to 1815 | From French Revolution to the First World War | From the First World War to the present |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Political Institutions | The City State, <br> The Roman <br> Empire; The <br> Golden Age, The legal person. | Christendom, Marauding imperialism, The Holy Roman Empire; feudal kingdoms, Decline of the Papacy. | Rise of centralized territorial states. Absolute Monarchies | Absolute Monarchy, enlightened despotism, The English parliament, French Revolution | Revolutions, liberalism, conservatism, democracy. Nationalism. | Liberal <br> Democracy, <br> Fascism, <br> Socialism. <br> Welfare States. <br> Left and Right. |
| Philosophy and Theology | The rise of "reason"; The Gods in human form, God beyond Nature, The Trinity. | Theology "queen of the sciences." Reason and Faith. Realism and Nominalism. The Absolute System. | Secularism; mysticism; Christian humanism; The Reformation and Protestantism. The Counter Reformation. | Revealed religion criticized; <br> Deism. Empiricism and rationalism; idealism. | Revival of religion; <br> Sectarianism. <br> Reactions to rationalism. Positivism. Materialism. Evolutionary thought, Social Darwinism. | Existentialism; individualism. Atheism, Nontheism. Neo Orthodoxy. The Philosophy of History. |
| Scientific Thinking | Man against nature, Reason in nature. | Abstract <br> Speculation and deductive logic; Nature and the Divine Ideas. | Modern conception of science begins: Cartesianism; astronomy. Mathematics and Science. | The public acceptance of Science. The growth of the natural sciences. | Scientific advance and technology. The social "sciences", evolution. Advances on all fronts. | New directions in Physics: the atomic age. Technocracy, The Computer. |
| Economic Institutions | Slavery, Imperial Economy | The rise of cities, merchants, guilds. The feudal system: manorial system, fiefdoms. | The growth of capitalism: trade and industry. Decay of feudalism. | Contests for commerce and colonies; the bourgeois revolution. Beginnings of Industrialism. | Industrialism, Capitalism, imperialism. | Monopoly and Corporate Capitalism Neo Colonialism; Modernization and The Third World |
| Structure <br> of <br> Society | Family, Tribe and State. | Monasticism. Feudalism: peasants and nobles. The beginnings of the "middle classes". The Church and Society. | Monarchism; the mercantile society and its structure. Decline of monarchical system. | Criticism of divine right; republicanism; Class societies; State and Society. | Parliamentary democracy; the entrenchment of the bourgeoisie. Social classes. | Class Societies and Socialist Societies. Problems of race. Bureaucracy. |
| Literature and Music and Art | Epic and Tragic drama, Myth; the Ideal and the realistic. | Romanesque: <br> Gothic, <br> Plainsong, <br> Polyphony. The <br> beginning of <br> "modern" <br> literature. | The Renaissance and its products; Baroque art and music. | The "neoclassical" era. Rococo and Baroque. Early phases of Romanticism. | Romanticism, nationalism in art. Naturalism. Impressionism. | "Alienation" and the Arts; <br> The Waste Land Experimentation and <br> fragmentation, The problem of form. |

General Faculty Regulations
re subject to changes in regulations does not involve the award of a second degree; ses made after their first registration ifically excuse regulations hereunder about the reguations hereunder made hardship from application of eregulations may appeal for relief Registrar to the Committee on
eneral
n to Classes
ent shall be admitted to a class until he fied the regulations regarding entrance

of Undergraduate Studies
-
is normally required to complete his
indergraduate
inst registration
Auditing
f full-tiin
may, w
e student registered in this University
the permission of the instructor
, audit any class in the Faculty of
Irts and Science, provided that it is clearly
nderstood that he will not be eligible to write
nderstood that he will not be eligible to write
cuminations in the class and will not in any
nces be granted credit for it.
ed Placement
possessing advanced knowledge of hich he has acquired otherwise than rsity, will be encouraged to begin his that subject at a level appropriate to ledge, as determined by the departcerned, and will be exempted from which are normally prerequisities
to which he is admitted. However, to which he is admitted. However, equal number of other classes, not
in the same subjects (i.e., he must
at the University the full number of
quired for a general or an honours
of Classes toward Two Undergraduate
c., or B.Com.) and who wate degree undergraduate degree must fulfill the
nts of the second degree and meet the
stipulations:
classes that are applicable to the
the second degree may be counted
class carried forward must bear a C or higher;
nimum of six new classes must be
which four must be in a declared
hence it is not subject to this regulation.
Concurrent Registration at King's and Another Educational Institution
Ordinarily no student may register at King's if concurrently taking work in another educational institution. Regulation 8 below outlines procedures to be followed to secure waiver of
this gent this general regulation. Regular exceptions are made with res
institutions.
Forced Withdrawal Consequent on Unsatisfactory Performance When the work of a student becomes unsatisCommittee 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 temporarily from the University or to reduce his class arily f.
load.

## 2. Credit and Assessment

A credit toward a degree is earned in full-credit class, a class in which typically there are two to three lecture hours weekly for the Credits may be to May) academic year. studies
(a) normally during the regular academic year; or exceptionally
(b) dur
ence,
(cior to transfer from other universities attended (d) at other institutions,

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 or diploma, student must meet the requirements relevant to that degree or diploma and must appear at all
examinations, prepare such essays, exercises, 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

obligations credit, a student must settle all tuition and residence fees wookstore debts library fines, etc. (not later than April debts, 30 for Spring Convocations).

Method of Assessment
In determining pass lists, the standings attained
In determining pass lists, he standild or labo
tory 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 students are informed of the method of
evaluation to be used in a class within two evaluation to be used in a class within two
weeks of the first meeting of the class; within four weeks after the beginning of each term the departmental chairmen must report to the Dean the method of evaluation to be used by each instructor in each class.

Grades
The passing grades are $\mathrm{A}+, \mathrm{A}, \mathrm{A}-\mathrm{B}+\mathrm{B}, \mathrm{B}-$ C , and D . The failing grades are $\mathrm{F} / \mathrm{M}$ and F .

Submission of Grade
On completion of a class, the instructor is required to submit grades to the Registrar, such
grades to be based on the instructor's evaluagrades to be based on the instructor's evalua-
tion 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 100 -level full-year classes with enrolments in excess of 25 (on Occober 1); Christmas grade
are normally submitted in other full-year are no
classes.

## complete

Each student is expected to complete clas work by the prescribed deadlines. Ordinarily there is no obligation for any instructor to extend such deadlines. Incomplete work in a class may not be completed for credit after September 1 following the academic year in
which the class was taken, and no incomplete which the class was aken, and no incomplete
notation will be changed by the Registrar after that date.

## Change of Grade

orrection of errors in the recording of a grade nay be made at any time. The final date for grade changes for other reasons is September ollowing the academic year; such changes to b ade only after the procedures for reasse,
xaminations
A period of roughly two weeks in the spring period of roughly two weeks in the sprin nd one week in December will be set aside
the scheduling by the Registrar of formal written examinations. An instructor who wants 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. An inebruary 15 for the Spring period. An in-
structor may also arrange his own examination 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
Registra's examination schedule takes priority Registrar's examination schedule takes priority.
Instructors should avoid scheduling hour tests covering the work of the entire term during the last week of classes in the term.

Reassessment of a Grade
On payment of a fee，a student may appeal to
the Registrar for reassessment of a grade in the Registrar for reassessment of a grade in a
class．The Registrar will direct the request to 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．

## Special Examinations

Special examinations may be granted to stu－
dents in medical certificate，or in other unusual or exceptional circumstances．Medical certificates must be submitted at the time of the illness and will normally not 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 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
（a）he obtained a final grade of $\mathrm{F} / \mathrm{M}$ ；
（b）he has satisfied the requirements for the class（see Regulations）；
（c）a final examination or test in the class in question accounted for at least forty percent of the final grade（the supplemental examination constitute the same proportion of the final grade as did the final examination during the regular session）
（d）he has not failed his year

The supplemental examination must be written in August immediately following the failure．It may not be deferred．Notice of intention to write，together with the required fee，must be presented to the Registrar＇s Office no later than
July 10．

A student who fails to pass the supplemental examination can obtain credit for that class only by repeating it．
No more than one supplemental examination may be written by any student on the work of any one year．

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

No supplemental examinations are allowed for classes taken at Summer School．
No more than five passes obtained as a result of supplemental ex
toward a degree．

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

## 3．Merit Points and Minimum Standing

Merit
follows

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

Note that although D is a passing grade，no points are awarded．For fractional credit
classes，corresponding fractional merit point re awald（en would yield $1 \frac{1}{2}$ points）．Students receiving redit for classes taken at another institution re not awarded points for those classes；the
minima stated in the rules below are adjusted i proportion to the number of King＇s credits received relative to the number required
linimum Standing for a General Degree In order to qualify for the award of a general egree，candidates must have obtained a mini－ mum of ten merit points on the fifteen classes required．For all students graduating in 1976 ad subsequently，a minimum of twelve mer points on the fifteen classes required must be obtained．（Note that the rule on minimum
standing stated in the 1972－1973 Calendar was not approved by Senate；if applied it would be more stringent than the regulation stated above．）
General Degree with Distinctio A general degree will be awarded＂With Distinction＂to a student who has achieved a for his degree（or a proportional figure if he ha taken more than 15 classes）．
Minimum Standing for an Honours Degree Students in honours courses are expected t each year of study；if they fail to do so，they may be required by the Committee on Studie transfer to a general degree course

## 4．Regular Academic Year

## Workload

Five classes shall be regarded as constituting hormal 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 $C$ ．

## Failed Year

A student is considered to have failed his year if he passes fewer than three of the full classes（or their equivalent）for which he is registered，
unless：
（i）the year is the first he has spent at any （i）the year is the first he has spent at any
university，when passes in only two classes are
required；
（ii）he is a part－time student， pass at least one half－class． The results reported in the pass cademic year determine whe ther a

## Penalty for Failed Year

 （a）A student who has failed his $y$ first occasion is required to reap Faculty for consideration for readmi（b）A student who fails （b）A student who fails a
occasions will be ineligible to University as either a full－time or student．Ordinarily an appeal will only if illness has seriously inter student＇s studies and this is esta submission of a medical certificate at the time of the illness．

5．Summer School and Correspo Classes

Limits on Credits
Up to five credits from Summer orrespondence classes may be a wards the requirements for a degree， classes must have been passed at an evel and can be accepted only i closely equivalent in content to cla mally given at King＇s．

## Maximum Workload

o student may take classes totalling ne full credit in any one Summe ession．Not more than two full cre academic year．

Exceptions will normally be granted Exceptions will normally be granted
Committee on Studies only in attendance at a university which rimester system or its equivalent．

In all cases，permission must be advance，following the procedur below

## redit for Summer School Classes

 InstitutionsA student wishing to take，at a univ han Dalhousie，a Summer School degree must：
（a）obtain an application form from of the Registrar at Dalhousie Universi b）obtain from the university he $p$ attend a full description of the Sumn classes（or alternative classes）he wis
ussally the Summer School suffice；
（c）make application to the R Dalhousie University and submit description of the class he wishe Itternatives should be indica possible）．
ion has been reached，the studen ified directly by the Registrar．If the favourable，the receiving university faviuran by the Registrar＇s Office．

## dence Classes

dence similar to the above relates to ence classes and，at the present time， correspondence classes offered by
should make application for Summe s early as possible in order that they te necessary arrangeme

6．Transfer Credits
of of application for admission to ersity，and an official transcript， will be advised of the number of ich may be transferred from another
However，provisional assessment can interim transcripts．

7．Credits from Other Faculties
student taking classes in another Faculty as

$$
z
$$ of that Faculty with respect to

8．Cre itits from Other
Concurrent Registration
A tudent，while registered at King＇s，wishing to take clisses at another institution，must make
in application to the Registrar at Dalhousie and a description of the classes offered at her institution．A letter of permission will provided if approval for the classes is given
he appropriate department． propriate department．
will be paid by Dalhousie if： at Dalhousie－King＇s．
sfee will be paid by the student if King＇s．
e will be paid by the student if
a part－time student at Dalhousie－

## 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 must be apposistation change form which and by the Registrar．

Withdrawing from Classes
（a）The last day for withdrawing from a class without penalty is：for A classes： 16 November， for B classes： 1 week after study break，for C classes： 31 January，for full year classes： 31
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 instructo 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 Regula tion）．
（d）A student may not transfer from full to part－time status by withdrawing from classe ter the deadlines listed．（see Regulation）
to Part－time Status
A registered student who wishes to withdraw from the University，or one who wishes to change from full－time to part－time status，must stances．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．

## 10．Experimental Classes

Experimental classes，on any subject or com bination of subjects to which the arts and sciences are relevant and differing in conception rom any of the classes regularly listed in initiative of students or of faculty members．
formed on the initiative of students，the students concerned shall seek out facult members to take part in the classes．

Whether formed on the initiative of students or Whether formed on the initiative of students ot
on 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 o half－year length．

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

Classes may be formed any time before the end of the second week of classes in the Fall term run the year or first half year，or any time
efore the end of the second week of classes in he Spring term．If they are formed long nough in advance to be announced in th Calendar，they shall be so announced，in a ramme；if they are formed later，they shall be announced（a）in the Dalhousie Gazette，（b）in he 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 th apporteur of the class．It shall be his respons－ of the formation and content of the class；（b） oo obtain from the Curriculum Committee aling as to what requirement or requiremen of distribution and concentration and credit the lass may be accepted as satisfying；（c）to
eport to the Registrar on the performance of tudents in the class；and（d）to report to the Curriculum Committee，after the class ha inished its work，on the subjects treated，the echniques of instruction，and the success of he class as an experiment in pedagogy（judged omparisons with more familir types classes）．

A student may have five one－year length experimental classes（or some equivalent com unted as satisfying class for class any of the quirements for the degree，subject to the nd（where relevant）to the approval of th
departments．

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Requirements for Entrance to Divinity Courses
The basic Divinity degree course is normally a post-graduate programme regulated by the
Senate of the Atlantic School of Theology Students may take Divinity classes without being committed to ordination, either on the part of themselves or the Faculty.

Non-graduates who have university matricula tion may, on the recommendation of a Bishop embarking on the course they will be required o complete a probationary programme of or two years depending on their standard of natriculation, provided always that five unive sity credits or their equivalents be completed. On satisfactory completion of the basic pro Bachelor of Theology (B.Th) This provision intended for older men. Only in exceptional aircumstances will it be allowed to enrol unde the age of twenty-five.
Taster of Divinity (M.Div.)
This degree is designed for those who already hold a bachelor's degree on entering Divinity tudies. The course consists of the basic programme of the Atlantic School of Theology colty of electives being approved by the Ordinands) from the Anglican professors.

Master of Sacred Theology (M.S.T.)
In conjunction with the Institute of Pastoral raining, the University of King's College no ffers the degree of Master of Sacred Theology in the field of pastoral care. Particulars concerning regulations for this degree may be
obtained from the Executive Director of the nstitute of Pastoral Training at the University of King's College. A degree in Divinity is a prerequisite.
The Testamur
A student who has passed not fewer than programme may be awarded the Testamur.

Diploma of Associate of King's College (Nova Scotia) (A.K.C.(N.S.)) the diploma of King's College has established (Nova Scotia) Associate of King's College further study for those (N.S.), to encourage eligible for the B.D. It combines extramural and intramural work, and now includes Pastoralia. Particulars concerning regulations for this diploma may be had upon application to the .

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 have qualified or the L.Th. may proceed to the B.D. under the General Synod Board of Examiners. By agreement among all Anglican Theological Colleges in Canada, the Degree of Backelor of Divinity is now awarded only by
examination by the Board of Examiners of examination by the Board of Examiners of
General Synod. (No new registrations after November 30, 1973).

## Associate in Theology (A.Th.)

By arrangement among all Anglican Theological Colleges in Canada, the Title of Associate in Theology is now awarded only by examination Particulars (concerning regulations for this Title) may be had upon application to the 30,1973 ).

## Medical Examination

For all candidates for ordination a medical examination by the General Synod physician is the responsibib their first year in Divinity. It is necessens ability of the student to make the Office at the earliest opportunity.
upplemental Examinations
No student may write more than three supplepast mark for which is $50 \%$.

The Divinity Curriculum
In association with the Atlantic is carefully designed to cover the tenets of the Christian Faith, its history, and its application in the twentieth-century.
in most cases, the curriculum follo individual student will be mapped
result of consultation between that King's Divinity Facilly. It will drat main on the resources of the Atlantic Theology, supplementing these as
quired for specific goals of the st example full-time ministry, ordained wise, in the Anglican Church of Can supplementary studies or training will be recognized for credit by the Atlan of Theology and not constitute an burden on top of the requirement
School.

Details of the basic course r
offerings of the Atlantic Sch
offerings of the Atlantic School of are given in a bulletin published separate available from the
Registrar on request.

## te of Pastoral Training

## of King's College chool of Theolo chnty College inity College

zation of the Institute in collaboraPine Hill Divinity Hall, the Divinity of Acadia University, Presbyterian niversity, pioneered this modern in in Theological education on th scene. It is the objective of the
bring pastors and theological to bring pastors and theological
ce to face with human misery as it in and out of institutions, through Clinical Pastoral Education in both mental hospitals, reformatories and ourts, homes for the aged, alcoholism centres, and other social agencies. In ction, the Ilinstitute nastoral Education, mmencing mid May, at the Nova sptial, Dartmouth (mental), the Nova natorium, Kentville, the Victoria sprital in ander Kew Bruswick Hosppalile and Springhill Medium al Center, Springhill.

## While the

above mentioned courses
primarily at increasing the pastoral competence of the parish minister or church worker students of particular aptitude and interest ca be guided in further theological training to 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 he mentally il or alcholics, where the church ship with other helping professions.

A recent development in this field was the formal constitution in December 1965 of "The Canadian Council for Supervised Pastoral acros $C$, which seeksto co-ordmate train. across Canada, establishing and maintaining certifying supervisors. The Institute of Pastoral Training has links with the Council, its Executive Director served as President of the Council and as a member of the Board of Directors, and two members of its Executive serving on the Council's Committee on Accreditation and King's College, who has directed the six-weeks course at the Nova Scotia Hospital, Dartmouth, and now directs courses at the V.G. Hospital, has been certified as a Chaplain Supervisor, by

PARISH TRAINING
All students who are candidates for are expected to undertake some Sund sponsibilities, and may participate in the
"Parish Training School" arranged Pastoral Committee of the Diocese Scotia as a help for students going to work in rural or mission parishes. The Pr of Pastoralia shares in the overall dire this Parish Training Programme which The School takes cabities and is not Spring Examinations and graduation we

## Extension Department

courses are given in the evenings at naterial of King's College and cover The Public Relations reourse ind Jourand Journalism is given every other and Journalism is given every other not for credit as academic requirewaived, making the study proavailable for citizens in the comwell as for registered studen nce in $O$ ctober of each year
elations (A Survey of the Entire

These lectures attempt a practical application of the theory of communications. Subjects discussed include: History and Philosophy of (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; tech agencies, churches, schools, government; tech-
nique of communications (mass media, printed and spoken word, films, speeches, displays, advertising), case histories, Seminar discussions include letter writing, human conflicts and publicit
the Canadian Council and also by the Associaion for Clinical Pastoral Education in the United States.

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

A number of one-day and four-day workshops have already been held in various localities in the Maritimes, and obtained from the Secretary of the Institute.

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 given by forthcoming. Academic credit colleges, including the Atlantic School of Theology, for satisfactory completion of any of the courses offered. Applications to attend the urses from bona fide enquirers belonging to qual consideration. welcomed, and receis other professions are
 s


 sideration. welcomed, and

JOURNALISM (A Survey of the Entire Field These lectures attempt a practical application of journalistic theory and mechanics. Subject tice, newspaper organization, ethical standards physical aspects of a newspaper, beginnings of ournalism, editorial policies, new mechanical evices, nature of news (what people read) athering news, rep.orting techniques, art of lews writing in various categories (civic, socia, business and industry, sports, etc.), editing the news.

## Scholarships, Prizes and Bursaries

Any scholarship winner who can afford to do
so is invited to dive 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 arrange ment increases the values of the Scholarships Funds, as it enables other students of scholarly attainments to attend the University.
All Scholarships, Prizes and Bursaries, except All Scholarships, Prizes and Bursaries, except to the student's account and not paid in cash.

Application for scholarship and bursaries should be made to the Registrar

In order to retain scholarships tenable for more year, with no failing mark in any subject.

Arts and Science
A. Entrance Scholarships

Dr. W. Bruce Almon Scholarship - $\$ 1500$ a year. Established by the will of Susanna Weston student entering the University open to a College and proceeding to the degree of Doctor of Medicine at Dalhousie University. It is renewable yearly provided that the student maintains a first class average, and lives in
residence each year until the regulations of residence each year until the regulations
Dalhousie Medical School require otherwise.

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

Henry S. Cousins Scholarships - (a) $\$ 1000$ a year, maximum $\$ 4000$ for four years, (b) $\$ 750$ a year, maximum $\$ 3000$ for four years. Both
scholarships open to students entering the Foundation Year Programme only.

Susanna Almon Scholarships - \$750 a year. Established by the University from the legacy of Susanna Weston Arrow Almon, these

Chancellors' Scholarships - $\$ 500$ a year. Established originally through the generosity of
the Hon. Ray Lawson, O.B.E. LL. the Hon. Ray Lawson, O.B.E., LL.D., D.C.L.,
former Chancellor of the University, and former Chancellor of the University, and continued by succeeding Chancellors, these
scholarships are open to students of the Atlantic Provinces, and are tenable for four years. The holders of Chancellors Scholarships will normally be required to live in residence.
Board of Governors Scholarships - $\$ 350$ a year. Established by the Board of Governors,

Halifax-Dartmouth Scholarships - \$300. An entrance scholarship for students entering the

King's College Bursaries - The Univerity offer
a limited number of small bursaries to entering
students of satisfactory academic standing and in need of financial assistance.

Alumni "Annual Giving" Scholarships - $\$ 600$ Established by the Alumni Association, thes cholarships are intended for entering students, but consideration will be given to applications College and who are in good academic standin The holders of Alumni "Annual Giving" Scholarships will normally be required to live in residence.
Margaret and Wallace Towers Bursary - $\$ 600$ a Year. Established by Dr. Donald R. Towers, an and father. This bursary, tenable for four years, is open to a student of high academic standing entering the University to study Arts and Science and who is a resident, or a descendant of residents, of Charlotte County, New Brunscounty in any one year, the bursary for that year only will become available to a student resident anywhere outside the Maritime Pro nces of Canada. Holder must live in residence.
Winfield Memorial Entrance Scholarship 200. Established by Mrs. W. A. Winfield in memory of her husband.

The Alumni Scholarships - $\$ 300$. The Alumn Association has established two scholarships of 300 each: one restricted to students of King etherwood or Halif ax Ladies College and on unrestricted.

Keating Trust Scholarships - $\$ 125$. Awarded from a bequest to the College from the Rev. J Loyd Keating to students entering College with
outstanding marks in Science, these schola ships, according to the will of the donor, are intended to encourage students, and preferably Divinity students, in the study of chemistry and physics, and scholars will be required to take a ast one class in physics or chemistry durin
ova Scotia Light \& Power Co. Ldd Schola ship - \$300 a year. The Nova Scotia Light \& Power Co. Ltd., offers an entrance scholarship of $\$ 300$ a year, tenable for three or four years, $65 \%$ ang the student mainains an average o

Nova Scotia Teachers College Bursary - $\$ 500$ warded on the recommendation of the College who registers as a full time student in the Faculty of Arts and Science.

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

King's College Naval Bursary - $\$ 30$ order to commemorate the unique Celationship between the Universit
College and the Royal Canadian the Second World War, ships and est of the Atlantic Command have set to enable a student to attend King's,
Applicants must be children of men either serving in the Royal Can or retired from the R.C.N. on pen
mic achievement and promise will consideration in selecting a candid industry, and character are to b weighed, together with the likeliho tion to benefit not only himself country.

The Bursary is awarded annually intended to be tenable by the same provided comptetion of his course at Ki The Bursary will be withdrawn in academic failure or withdrawal College for any reason.
Deihl Bridgewater Bursary - $\$ 250$ needy students of suitable standing,
the town of Bridgewater, or within he town. Bequeathed by the Late Deihl.

Walter Lawson Muir Bursary warded at the discretion of the Committee either to a student ente or the first time or to a student
college who won high scholastic stan previous year. Endowed by Mrs. W. L
he United States Scholarship - $\$ 5$ ed annually by Friends of New Corporation, to a student resident in the Corporation best exemplifies tion of the importance of good r Cetween the people of the United Canada.
n any year the scholarship may mong two or more students.

Imperial Oil Higher Education Awar Oil Limited offers annually free other compulsory fees to all childre employees and annuitants who enable for a maximum of four y equivalent, at the undergraduate degree level. For particulars ap Registrar.
I.O.D.E. Bursaries, value $\$ 100$ to $\$ 20$ do entering students who show ability and financial need. Address a
to Provincial Education Secretary, Chapter, I.O.D.E., 5677 Victoria Ro N.S.
olarships,
$\qquad$ 's Scholarship - $\$ 250$. Three of $\$ 250$ will be awarded to the
makes the highest average at the first, second and third year Preference will be given to hold no other scholarship. nson Scholarship - $\$ 120$. Founded
n.A., (sometime ov Mathematics), of the value of $\$ 120$ rable for two years, this scholarship egate in the first year examinations.
arship will be credited in half-yearly s, provided always that the scholastic maintained.
Society Scholarship - \$300. An rd offered by the Alexandra Society College to a woman student who ghest in the second or third year ons, provided that she live in re-
if the student who stands highest is If the student who stands highest is ineligible, the award shall be left ion of the Scholarship Committee.

Strickland Vair Scholarship - $\$ 300$,
award to be offered a student first year who displays excellence in in English Major or English Honours ferred.
University Women's Club Scholar100 (Undergraduate). The Saint John 100 (Undergraduate). The Saint John
Women's Club awards a scholarship each year to a woman student entering ryear in a Maritime University. The made to a student from the City or Saint John, with consideration being
both academic attainment and need. For particulars apply to the before March 1.
son Prize $-\$ 100$. Established by The Lawson, former Chancellor of the ogress between the first and second
B. Smith Prize $-\$ 25$. Established by of $\$ 500$ from the late Dr. M. A. B. warded to the student with the highest the end of his second year with ten
case of a tie preference will be given case of a tie preference will be given
ity student

Bibhop Binney Prize $-\$ 20$. This prize, which
was fo unded by
he ded by Mrs. Binney in memory of her Traduate with the best examination at the end of the second year with ten
s Historical Prize $-\$ 100$. Founded by ner of Public Records.

The award is made for the best original study 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 perty of King's College. The Beatrice E. Fry Memorial - $\$ 50$. 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 exceeds $65 \%$.

The Henry deBlois English Prize - \$15. The late Rev. 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 Governors of the College to establish a prize in
English. Awarded to the student of the 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

The Almon-Welsford Testimonial - $\$ 30$. 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 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 either Latin 100 or Latin 200 , provided the mark is not less than $65 \%$.

The McCawley Classical Prize - $\$ 35$. Established as a testimonial to the Rev. G. McCawley, D.D., on
President.

Open to students who have completed their first year.

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

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 Hibbert Binney, in memory of her father.
This scholarship is intended to aid students who may require assistance, and who shall have
commended themselves by their exemplary commended themselves by their exemplary
conduct, although their abilities and achieve ments may not qualify them to be successful competitors for an open scholarship.

Charles Cogswell Bursary - $\$ 20$. Charles Cogs well, 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

The Harry Crawford Memorial Prize - $\$ 40$ Offered annually by a friend in memory of Harry Crawford, son of Thomas H. and Elizabeth A. Crawford, Gagetown, N.B.; student of this College, who died true to his serving in the Canadian Motor Cycle Corps.

The prize is awarded to the student completing the second year Arts course, of good character and academic standing, who in the opinion of the Faculty deserves it most.

The Jackson Bursary - $\$ 25$. Founded by the Rev. G. 0. Cheese, M.A. (Oxon.), in memory of his former tutor, the late T. W. Jackson, M.A. of Worcester College, Oxford.

Graduate Scholarships, Medals and Prizes

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

The Rev. S. H. Prince Prize in Sociology. Thi prize was made available by a $\$ 1,000$ beques nnual award to both Dalhousie and King's Students.

The Rhodes Scholarship. This scholarship is o he annual value of 750 pounds sterling. Before applying to the Secretary of the Committee of must be made by November 1), consult th Registrar, King's College.
hodes Scholars who have attended the Univer sity of King's College
909 Medley Kingdom Parlee, B.A., ' 08 1910 Robert Holland Tait, B.C.L., '14
1916 The Rev. Douglas Morgan Wiswell, B.A

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\text { T14 M.A., } 16
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916 The Rev. Cuthbert Aikman Simpson, B.A., '15, M.A., '16

1919 William Gordon Ernst, B.A.,' $17{ }^{1}{ }^{2}$ The Rev. Gerald White, B.A., ${ }^{23}$, M.A 1925 M. Teed, B.A. '25
936 Allan Charles Findlay, B.A., '34

1938 John Roderick Ennes Smith, B.Sc., '38 946 Nordau Roslyn Goodman, B.Sc., ${ }^{\prime} 40$ | M.Sc., ' 46 |
| :--- |

1949 Peter Hanington, B.A., ' 48
950 Eric David Morgan, B.Sc.,
1955 Leslie William Caines, B.A.,' 5
1955 Leslie William Caines, B.A., '55
1962 Roland Arnold Grenville Lines, B.Sc., ${ }^{\prime} 61$

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1963 Peter Hardress Lavallin Puxley, B.A., '63 1969 John Hilton Page, B.Sc., '69

University Women's Club Scholarship - $\$ 500$. The University Women's Club of Halifax offers a scholarship of the value of $\$ 500$ every second
year, 1964, 1966, etc., to a woman graduate of Dalhousie University or King's College, to assist her in obtaining her M.A. or M.Sc. degree at any recognized graduate school. For particulars apply to the Registrar
The Canadian Federation of University Women Fellowships - $\$ 1500$ to $\$ 2500$. For information apply to the Registrar The Imperial Order Daughters of the Empire
Post-Graduate Scholarships - $\$ 5000$. (For study overseas) and $\$ 3000$ (For study in
Canada) gistrar.

Imperial Oil Graduate Research Fellowship
$\$ 3000$ for three years. For information apply $\$ 3000$ for three years. For information apply to the Registrar.
Commonwealth Scholarships. Under a Plan drawn up at a conference held in Oxford in
1959, each participating country of the Com monwealth 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 fees, other university fees, and living allowance. For details of
the awards offered by the awards offered by the various countries consult the Registrar's office or write to the
Canadian Universities Foundation 75 Albert Street, Ottawa.

Rotary Foundation Fellowship. Open to graduate students for advanced study abroad. Available every second academic year, 1963,
1965, etc. Applications must be considered before August 1st of previous year. Information nay be obtained from Rotary Clubs or the Registrar

## Divinity

Owen Family Memorial Scholarships - Two of $\$ 250$. Established by Mr. and Mrs. D. M. Owen, in memory of the Owen family, tenable for one year, but renewable, and open to applicants
who are Nova Scotia born, and resident therein, and are or are about to become theological students at King's College, preference being
given (1) to native residents of the town of Lunenburg, and (2) to native residents of the county of Lunenburg.
Canon W. S. H. Morris Scholarship - $\$ 1,500$. This Scholarship was founded by the late of his father, the Reverend Canon W. S. H. Morris, M.A., D.D., Kingsman, Scholar and Parish Priest in the Diocese of Nova Scotia for
forty years.

The Scholarship may be awarded annually by the President and Divinity Faculty to the most deserving member of the present or recent been at King's at least two years, and who, in the opinion of the Faculty, would benefit from savel and/or study in Britain, the U.S.A. or of Canada, provided he reaches a satisfactory standard. Applications, stating the use which the applicant expects to make of the Scholarship, must be submitted to the Dean of Divinity on or before January 8 , of the year in which the applicant, if successful, intends to use the
scholarship. The recipient will be required to serve in the Atlantic Provinces for a minimum of three years after his return from abroad.
William Cogswell Scholarship. Open to students intending to work in the Diocese of Nova
Scotia. Scholarship (A). Under the the Trustees of the William Cogswell Scholarship to be awarded to the student who passes a satisfactory examination and who takes his Divinity course at any recognized Divinity College of the Anglican Church in Canada best the terms of the Trust, giving when possible preference to King's College.

Scholarship (B): Under the direction of the Faculty of Divinity of the University of King' college, Halifax, Nova Scotia, an entrance quality of work submitted, will he 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 reaches a satisfactory standard. The recipient
will be required to sign a statement promising to serve in the Diocese of Nova Scotia for a period at least as long as the period during which he holds the scholarship.

This examination will consist of two papers a. A paper on the content of the Old and New
Testaments, and Testaments, and
the New Testament (revised edition by C S. Williams) Oxford, 1953.
Awards will not be made every year.
The Daniel Hodgson Scholarship - $\$ 240$. 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 or of $\$ 60$, tenable for four years, is for the
purpose of encouraging students to take an purpose of encouraging students to take an Arts
Degree before entering upon the study preDegree before entering upon the study pre-
scribed 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 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 shall file with the Trustees a certificate from
he President or Secretary of the College (or has been excused residence) and has attended the full in the College", together with a cer his moral conduct, his attention to and his general conduct have been to the Board of Governors.

Scholars who fail to comply with th conditions automatically forfeit th
ship, but in special cases the Bi ship, but in special cases the Bish representations of the Trustees, mas

The Bishop Waterman Bursary Clements) - $\$ 150$. The Parish Nova Scotia, wishing to give tangible oo its appreciation to the Rt. R Waterman, D.D., for his services to
immediately following upon his te Rector (Rev. W. H. Logan, De 1964), has set up a Bursary Fund, to as the Bishop Waterman Bursary Fu young men entering King's College raining for the Ministry. An amou than $\$ 150$ is to be forwarded by th September 1st of each years. This September 1st of each year. This
be used at the discretion of the Divinity in consultation with the Bis Diocese for the assistance of any can Holy Orders needing it from any Pa
Diocese of Nova Scotia enrolled at Diocese of Nova Scotia enrolled at raining for work in the Diocese of N rom the Parish of Clements If any such training, he shall be given firs tion in the awarding of the Bursary.
The Mabel Rudolf Messias Divinity $\$ 120$. The interest on an endo 2,000 , the gift of Mrs. M. R. n annual bursary for a needy and Divinity student studying at the Un King's College, on the nominati Faculty of Divinity.

Order of The Eastern Star Order of The Eastern Star - $\$ 30$
scholarships are to be awarded, primar basis of financial need, to 2nd or 3rd students, or to older men with degree, in their 2 nd or 3rd year of The
The H. Terry Creighton Scholarship approximately. The annual income endowment of $\$ 2,000$, established and friends to honour the memory o Creighton of Halifax, Nova Scotia, , the Diocese of Nova Scotia for many

The award is to be made to Anglican Divinity Student in his fin training who is intending to enter th no suitable candidate for the training in Nova Scotia, the awar made, in consultation with the Bisho Scotia, to one studying elsewhere,
dent intends to return to Nova inistry in that Diocese.

Donaldson and Cornwallis W. A Donald Sursary was established
$\$ 400$. This But \$40.s (Cornwallis, N.S.), Anglican men to provide a living memorial to work of Mary How Donaldson, who connections with King's, and o W. A., of which she was a charter
It is to be awarded on the recomof the Divinity Faculty to a dember of the Divinity School at le or female, preferably a Nova $o$ is prepared for full-time service in
and is in need of financial as-
M. Ambrose Proficiency Prize prox.) The income from a trust fund memory of Canon G. M. Ambrose, lumnus of King s, provides an annual the Divinity student who receives the dregate of marks at the end of his fir kes the regular full course in theo
et Draper Gabriel Bursary - $\$ 450$ as been established in memory of Draper Gabriel by her son, Rev. A.E
4.A., an alumnus of King's, the yiel is to be used to give financial aid to tian Divinity Student entering King's preparation for the Ministry of the The recipient must be nominated or year there is no candidate for this ear there is no candidate for this
the yearly yield is to be used to the fund. Should King's College Shool cease to exist as such, the fund transferred to the Diocese of
d the income used as aforesaid.
H. H. Picke
kett Memorial Scholarshi
latt Memorial Scholarship - $\$ 175$. larship is payable to the student
he final year of study for the Sacred who has shown the greatest all round nt during his time in Divinity Peference is to be given, first, to a Trinity Church, Saint John, and,
k Wilson Memorial Bursaries - $\$ 100$. blished in 1947 by Miss Catherine R. memory of John Clark Wilson. Two
of $\$ 100$ each, tenable for one year to Divinity students deemed worthy al help. qualified and willing to play the organ ollege Chapel (Casavant-2 manual pipe services throughout the year. The
set in negotiation with the Divinity
students of Prince Edward Island, preference being given to Divinity students. Application, accompanied by a certificate of had from the Registrar
character from the applicant's Rector, must be sent to Canada Permanent Trust Company, Charlottetown, P.E.I. on or before May 31st.
Moody Exhibition - \$100. The "Catherine L. Moody" Exhibition of $\$ 50$ a year for two years is awarded every two years to the student entering the second year preparing for Holy
Orders, whose scholarship and exemplary conduct shall, in the opinion of the Faculty, merit it. (Next award 1975).

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

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

The McCawley Hebrew Prize - $\$ 25$. Open to all members of the University who are below the standing of M.A.
This prize is given out of the interest of a Trust Fund, the gift of the Reverend George Mc-
Cawley, D.D., in the hands of the Society for the Propagation of the Gospel in Foreign Parts.

This prize will be awarded to the student who leads the class in Hebrew 2 and receives a

Junior McCawley Hebrew Prize - $\$ 25$. With the accumulated unexpended income from the McCawley Hebrew Prize a fund has been set up establishing a second prize, to be awarded to
the student standing highest in first year Hebrew.
Archdeacon Forsyth Prize - $\$ 50$. The Ven. Archdeacon D. Forsyth, D.C.L., of Chatham, $\$ 1,000$ 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

Shatford Pastoral Theology Prize - $\$ 40$ Established by an anonymous donor, in memory of the late Rev. Canon Allan P.
Shatford, C.B.E., D.C.L. Awarded annually for Pastoral Theology. The winner must receive a recom
ralia. Laurie Memorial Scholarship. One or more
scholarships of about $\$ 250$ each, founded in
memory of Lieut.-Gen. Laurie, C.B., D.C.L., open to candidates for, the Ministry, under the direction of the Trustees. Particulars may be

The Wiswell Trust Divinity Studentship $\$ 120$. A. B. Wiswell, D.C.L., Hon. Fell. (Vind.)
of Halifax, N.S., in order to perpetuate the of Halifax, N.S., in order to perpetuate the
memory of the Wiswell family, augmented a memory of the wiswell family, augmented a providing a capital sum of $\$ 2,500$, the income of which is to assist Divinity students at King's College, who were born in Nova Scotia and wh propose entering the ministry of the Anglican Church in Canada.

Prince Prize in Apologetics - $\$ 60$. Established by a bequest of the late Dr. S. H. Prince. of the Faculty. (Next award 1973-74).

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

Preference will be given to a student who has given promise of the needed qualities and has taken his degree or is within a year of completing his Arts course. If there is n
student meeting the above requirements the award will be left to the discretion of the Divinity Faculty. of the Faculty
A. Stanley Walker Bursary - $\$ 200$. A warded by A. Stanley Walker Bursary - $\$ 200$. Awarded by
the Alexandra Society of King's College. To be given annually to a Divinity student.

Johnson Family Memorial Bursary - $\$ 60$ Founded by the Misses Helen and Marguerit 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 grounds not only of scholarship, but also, on grounds not only of scholarship, but also,
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 Divinity who require assistance are made by the
Archbishop of Nova Scotia, and by the Bishop of Fredericton. The holders of these must fulfil such conditions as the Bishops lay down and in every case attend a personal interview. Fo further particulars apply to the Divinity Faculty
The King's Divinity Scholarship - \$150. The Anglican Church Women in the Diocese of ova Scotia makes an annual grant of $\$ 15$
owards the expenses of Divinity students wh agree to work in the Diocese of Nova Scotia
agree to work indination.

## Clara E. Hyson Prize - $\$ 5.00$ Founded by Miss <br> Clara E. Hyson and awarded each year on vote

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Archbishop Kingston Memorial - \$100. A ward annually by the Nova Scotia Diocesa


The Wallace Greek Testament Prize - $\$ 50$. ook Prize established by the late Canon C. H allace of Bristol, England, in memory of his father Charles Hill Wallace, barrister, of in 1823, and died in England in 1845 . Sobject pistle to the Hebrews. Application to be made to the Registrar 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 greates made twice to the same student.

Bennett-Cliff Memorial Prize. A prize of $\$ 10.00$ each year. Award to be at the discretion of th President

Bibliography
. Manson: The Sayings of Jesus (SCV) J. Jeremias,
(A thlone Press)
F. W. Beare: The Earliest Records of Jesus H. K. MacArthur
on the Mount (Epworth).

The Bullock Bursary - $\$ 225$. Established by C A. B. Bullock of Halifax for the purnose defraying the cost of maintenance and educa tion of divinity students enrolled at King College who were, before being enrolled, Church there, and who are unable of a Parish cost of such maintenance and education

The Harris Brothers Memorial - $\$ 100$. To be warded at the beginning of each college year a bursary to a student of Divinity at the
University of King's College. The student shall be selected annually by the The student shal preference being given to a needy student from rince Edward Island, failing that, a needy failing that, to any deserving student of Divinity at the said University.

The Carter Bursaries - $\$ 160$. Two bursaries a value of $\$ 160$ each, established under the wil
of Beatrice B. Carter of o be used to assist young men studying for th ministry.

Royal Canadian Air Force Protestant Chape 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 a bona fide to (a) ex-R.C.A.F. personnel, (b) children of R.C.A.F

The Ott Reading Prize $-\$ 25$. Established by Dr. T. Gordon Ott. Awarded annually
student of Divinity for the Bible and the Services of the Chureding

The Ott Preaching Prize - $\$ 25$, Established by Dr. T. Gordon Ott. Awarded annually to student of Divinity for the best extempore sermon of an expository nature

William A. and Kathleen Hubley Memoria Bursary - $\$ 175$. This bursary is designed to
assist students from St Mark's assist students from St. Mark's Parish, Halifax,
and failing a 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 University of King's College.
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 nust be applied for annually.

The Reverend Dr. W. E. Jeff Bursary - $\$ 100$. This bursary, the
Parish Parish of Granville, N.S., is es
memory of Reverend W. E. Jeff an alumnus of King's and a gradua
who was ordained late in lif who was ordained late in life and to give nearly twenty years of dev
to the ordained ministry. Pref given to older men pursuing studies or to older men preparing tion. The award is to be made by Faculty.

The Archdeacon Harrison Memoria $\$ 20$. Established by Miss Elaine
memory of her memory of her father. To be an
deserving and needy Divinity discretion of the Faculty.

St. P
$\$ 20$.
20. Paurs Garrison Chapel Memoria chosen by the Faculty to attend Conference.
The Clarke Exhibition. An stablished by the late Reverend $C$ Clarke of Kingston, New Brunswic copies of "The Imitation of Christ" of each year's graduating Class in $D$ balance of the income each year warded by decision of the Divinity deserving Divinity Student for the

Halifax Deanery Laymen,
bursary in the amount of $\$ 100$. warded to a deserving Divinit nominated by the Divinity Faculty.

## Loan Funds

Edith Mabel Mason Memorial Stude Fund.
Established by Alumni and friends Morial to the late Miss Edith Mab Modern Languages af Women and Pro dents entering upon their third or fout Application to be made in writing Registrar.

Canada Student Loan

1. All Canadian students are eligible sidered for Canada Student Loans
most provinces, are administered in with provincial bursary plans.

## r

. Students should apply as early as pos requesting application forms from the
cial authority in order to have the available for registration.
sity of King's College Stu-
sity of King's College Students' organization right of self government. The
revised in 1964, provides for a revised in in which the participagovernment is expected. The students play a determining role in every niversity life. The Union's main he Student Assembly, the Executive dents' Union, the Students' Council. Union's Male and Female Resiils and the Campus Police.
operates through a number of committees, e.g.: the Academic the Social Commores, ions, awards, etc.
lege Women's Amateur Athletic King's College
lsscintion
of this association is the promotion 5 amateur sports at the College. The Intercollegiate Athletic Association petes in the Intermediate section of iation, field hockey, volleyball, and are played at the Intercollegiate floor hockey, badminton, table d swimming are available on a
scheduled basis in the University
ollege Amateur Athletic Associa-
ect of this association is the promotion sports at the College. The
is an honourary member of the Intercollegiate Athletic Association lll member of the Nova Scotia College ce. The University competes in intercompetition in the following sports: olf, hockey, volleyball, and basketball.
also strong inter-bay or inter-residence also strong inter-bay or inter-residence
tion in volleyball, road racing, softball, volleyball, basketball, and floor The gymnasium also has available for use a swimming pool, weight lifting regulation size gymnasium.
College Dramatic and Choral
was founded in 1931 to further in dramatic and choral work. The
 the society sponsors an inter-bay play and enters a play in the Connolly mpetition.

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

The King's College Record

## The R

undergad (founded 1878) is published by the academicuates of the College during the year's activities and awards.

The Quintilian Debating Society $\qquad$
This Society was founded in 1845. Quintilian sponsors interbay debates in competition fo
the Alumni Association (Halifax Branch) Interbay Debating Award. In addition further campus debates are seen in competition for the Rev. Canon A. E. Andrew Memorial Award fo Block Debating. During the Easter weekend of
each year a High School competition is coordinated by the Society, the Quintilian Exhibition Shield being awarded to the successful school in the Metro area (the Shield having been given by the Alumni Association, Saint John Branch). Annual tours of Upper Canadian wide range of academic activities

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

## The Ancient Commoner

newspaper
The Students' Missionary Society
This society was founded in 1890. Its object is
to promote interest in missionary work and to further the missionary work of the Church,
especially in the Maritime Provinces. The especially in the Maritime Provinces, The
annual meeting is held on Saint Andrew's Day, or as near to it as possible. Through the efforts of this organization, divinity students are provided with summer charges and•foreign
tudents have been afforded the opportunity of tudying Theology at King's. The status of this Society is at present under review in the light of King's participation
Theology.

The King's College Theological Com munity
The Theological Community is the Divinity and pre-Divinity student body of King's. The
community is the co-ordinating body of all Anglican Divinity student activities. It also provides a means of fellowship for Divinity and pre-Divinity students at King's. The Com unity holds meetings from time to time ther activities include the delegating icipating in ecumenical discussions.

## wards

The Student Body of the University of King' College awards an overall " K " to participants in uring the activies. Under this system, beg receive a silver "K" upon amassing 160 point and a gold " $K$ " upon amassing 250 points.

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

Bob Walter Award. Awarded to the graduatin male student who best exemplifies the qualities has contributed to the life at King's.

Warrena Power Award. Awarded annually the graduating female student who best ex mplifies the qualities of womanhood, gentle ess, and learning, and has contributed to the life at King's.

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

The Prince Prize. This prize is ncouragement of effective public speakin The recipient is chosen by adjudicators in an annual competition.

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

The Bissett Award This award is siven annuall

The Arthur L. Chase Memorial Trophy. This presented annually to the student who contributed most to debating in the College.
Alumni Association of King's College

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

The Association maintains annual scholarships.
The annual meeting of the Association is held
the day before Encaenia the day before Encaenia.
The Officers of the Association in 1973-74.
Presiden
The Rev. D.
Halifax, N.S
Vice-President,
Ms. Mary L. Barker, 5685 Inglis St., Halifax,

Treasurer,
Dr. Henry Muggah, Q.C., 6033 Belmont Road, Halifax, N.S.
Executive Secretary, Mrs. J. Desros
Halifax, N.S.

The Alexandra Society of King's College

This Society, which has branches all over the Maritime Provinces, was formed in Haliax 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 1973-74
Patroness,
Mrs. W. W. Davis.
Hon. President,
Mrs. H. L. Nutter.
Hon. Vice-President,
Mrs. G. F. Arnold.
Immediate Past President
Mrs. A. G. MacIntosh, 48 Beechwood Drive, Truro, N.S.
resident,
Miss Miriam Morris, 2438 Halifax, N.S.

Vice-Presidents,
Mrs. A. MacKeigan, 68 Reserve S N.S.
Mrs. P.

Mrs. P. N.' McIvor, 8 Lakeview P
mouth, N.S. Mrs. J.
N.S.
N.S.

Mrs. C. A. Orford, 86 Kent St., Charl $\xrightarrow{\text { P.E.I. }}$ Mrs. E. R. McCordick, 237 Brookside 9B, Nashwaaksis, N.B.

## Recording Secretary,

Recording Secretary,
Mrs. H. B. Wainwright, 9-1-7,
Armdale, N.S.
Corresponding Secretary
Mrs. D. L.
Treasurer,
Mrs. W. F. Palmer, 1652 Chestnut St., Hal N.S.


Convocation 1972
duating Class

Life President,
Robert Walker Howe
Fice-President,
Life fice-Presiderte
fuditit Ann McPhee
Life Sectetary,
Life Sectetary,
patricia Louise Rowat
Life Treasurer,
Jdidith Suzanne Blakeney
Judith Suzanne
Valeutictorian,
Douglas George Ruck
Doctor of Civil Law (honoris causa)
Leonard Philip Edwards Leonard Philip Edwards Thon as Head Raddall

Dotor of Divinity (honoris causa)
Harry Rhodes Cooper
ary Rhodes Cooper

## Bechelor of Divinity

Harris, The Reverend Ronald Edward, L.Th.,
, Bridgewater, N.S.
der, The Reverend Hayward, S.Th., B.A.,
lilifax, N.S
Master of Divinity

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\begin{aligned}
& \text { Dvivintry Wayne, B.A., Oromocto, N.B. }
\end{aligned}
$$

## Sacred Letters

Harris, The
Halifax, N.S

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& \text { The Re } \\
& \text { N.S. }
\end{aligned}
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Maxw.
N.B.
Tattrie,
Garth, B.A., Saint John,
Halifax, N.S.

## Bachelor of Arts

Banks, Peter Edward, Halifax, N.S.
Blakeney, Judith Suzanne, Dartmouth, N.S.
Bulley, Wilma
Bulley, Wilma Frances Grace, Sydney, N.S.
Burchell, William Wilf
Burchell, Willian Wilfred, New Glasgow, N.S.
Butts, Jane Florence
Butts, Jane Florence Isabel, Pierrefonds, P.
Chabassol, Ronald Bernard, Westville,
Priscoll, Sharon Elizabeth, St. John's, Nfld.
${ }^{\text {Pairn, Carol Gertrude, Dartmouth, N.S. }}$
${ }^{\text {'Perguson, Frances Shirley, Bedford N.S }}$
, Maureena Mae, Weymouth Falls,
4 Pryday, J
Harding,
C
James George, Black Point, N.S.
, George Ross, Lockeport, N.S. N.S.
Howland
H.
ert MacDonald, New Glasgow,

Huntington, Annie Ruth, Truro, N.S
Hutchins, Edgar Brian, Digby, N.S.
Jamieson, John Wayne, Halifax, N.S
and the University Medal in Sociology) Halifax, N.S.
Leggett, Wayne Harold John, Dartmouth,
N.S.
MacDo

MacDonald, Mary Catherine Sharleen, Halifax, N.S.
*MacDonald, Valerie Anne, Stellarton, N.S. MacLeod, Lorne Wayne, Glace Bay, N.S. MacPhee, Barbara Jane, Truro, N.S. Mader, Margaret Ethel, Barss Corner, N.S Mason, Juliana Louise, Tangier, N.S. Matthews, Linda Elizabeth, Dartmouth, N.S McAlden, Judith Elizabeth, Dartmouth, N.S *McClare, Judith Marie, Weymouth, N Miles, John Alfred, North Sydney, N.S Morine, Valerie Jeanne, Dartmouth, N.S. Musial, Frederick Anthony, River Ryan, N.S O'Neil, Charles Lawrence, Bridgewater, N.S Ostler, Kenneth George, Moncton, N. Rower, Robert Lloyd, Darmo Louise, Dartmouth, N.S. Ruck, Douglas George, Dartmouth, N.S. *Sawyer, William Barry, Halifax, N.S. Shears, Linda Noreen, Glace Bay, N.S Tedford, Lorna Mary, Sydney, N.S. Tha Din, John William, (Honours in Political
*Thomson, Glenda Louise, Halifax, N.S
Wainwright, Esther Jean, Halifax, N.S
*Whitzman, Raymond Elliot, Chomedey, P.Q
Zinn, Elizabeth Anne, Don Mills, Ont.

## Bachelor of Science

Bond, Eleanor Jane, Rawdon Gold Mines,
Chaldecott, Anne Elizabeth, Chester Basin, N.S.

Christiansen, Karl Kenneth, Saint John, N.B. Harfield, Lynda Avril, Dartmouth, N.S. Marriner, Margaret Jean, Riverview, N.B. Matthews, Mary Lou, Fredericton, N.B. McKay, Melvin Gregory, New Glasgow, N.S
Murray, Heather Louise, Stellarton N. Murray, Heather Louise, Stellarton, N.S. Nowlan, Barbara Marion, Halifax, N.S.
**Sheppard, George Graham, Mt. Stewart,
Tutty, Carolyn Ann, Louisbourg, N.S.
Tutty, Kenneth William, (Distinction), Louisbourg, N.S.

## Diplomas in Divinity

Title of Associate in Theology Eaton, The Reverend Edwin Francis, C.D. S.Th., Fredericton, N.B. S.Th., Fredericton, N.B.
Fudge, The Reverend Alton William,
Falmouth, N.S.
**Murray, The Reverend Ivan Cameron, Sain John West, N.B.
ertificate in Clinical Pastoral Education Allan, Stuart Wayne, B.A., Oromocto, N.B
*Conferred during the session
*In absentia

## Encaenia Awards

Arts and Science
he Governor General's Medal, Ian Johnson pril Fund Scholarship, Cathy Meisner resident's Scholarship (Third Year), Tricia Murwin
resident's Scholarship (second Year), Judit omlin
President's Scholarship (First Year), Alexi Inkpen
lexandra Society Scholarship, Cathy Meisner Steven
Hall
Lawson Price, Carolyn Campbell
Dr. M. A. B. Smith Prize, Cathy Meisner Bishop Binney Prize, Cathy Meisner eatrice E. Fry Memorial Zaidee Horsfall Prize in Mathematics, Alistai Dow, Edna Todd
Almon-Welsford Testimonial Prize, Alex nkpen, Victoria Pitt
McCawley Classical Price, Joseph Atkinson Charles Cogswell Bursary,
ackson Bursary, Paul Smith
Harry Crawford Memorial Prize, Carolyn ampbell
Claire Strickland Vair Scholarship, Susan Harri
 everend Henry John Sharam (1971), Th everenend Donald Arthur Neish (1972)
The George Sherman Richards Proficiency Prize, Lloyd Harold Ripley

Hebrew Prize, Th Reverend John William Tattrie
The Archdeacon Forsyth Prize, The Reveren Peter Wright Harris
he Shatford Pastoral Theology Prize, Stuat Wayne Allan
 Reverend John William Tattrie
The Ott Reading Prize, John Herbert Swain
The Ott Preaching Prize, Barkat Masih Khokha The Canadian Bible Society Book for th Reading of the Holy Scripture, Stuart Wayn Allan
The George M. Ambrose Proficiency Priz John Victor Cavill Pitt
The Princ
axwell The Dr. C Pennyman Worsley Prize, T Reverend John William Tattrie

Entrance Scholarships and Bursaries Awarded May, 1972 (Arts and Science)

Dr. W. Bruce Almon Scholarship
George M. Burden
Chancellors' Scholarship
Barbara Meier
King's Foundation Scholarship
Martin Adelaar
Geoffrey Henderson
George Lewis
eoffrey Strople
Halifax-Dartmouth Scholarship
Avard Bishop
Mary Bremner

Kim Henneber
Carolyn Johnson
Lynn Mitchell
Deborah Robichau
Wendy Roos
Deborah Ryder
Cathy Sullivan
John Wright
Alumni "Annual Giving" Scholarship
Sherri Aulenbac
Marlene Mulley
Margaret and Wallace Towers Bursar Brent F. Halford

Nova Scotia Teachers College Bursary
Gregory Dean Gidney

Alumni Scholarship

## NOTE

Deborah Halliday
Christy-Ann Loma
Walter Lawson Muir Bursar
Beverly Green

Keating Trust Scholarship
David Richey
John Sperry
University Bursaries
Paul Burton
Beverly Green
Deborah Halliday
Christy-Ann Loma
Mary MacDonell
David Riche
John Sperry


The following pages contain information about the programmes of study leading to the Degrees of Bachelor of Arts and Bachelor of Science and 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. 10), with the exception of King's College students enrolled in the Foundation Year Programme (see p. 19). The sections dealing with programmes leading to other degrees (such as Bachelor of Commerce, Bachelor of Education, Engineering, etc.) are also included for information, but only students enrolled at Dalhousie University may enter these other degree programmes.

## Degree Programmes

## 1. Courses of Study

Bachelor of Arts/Bachelor of Scienc General
Honours

Uniform Bachelor of Science for Engineering
Bachelor of Science in Engineering Physics
Bachelor of Commerce General

Bachelor of Education
Sequential
Integrated
Bachelor of Music Education
Certificate in Public Administration
2. Subject Grouping

| A. Languages | B. Humanities |
| :--- | :--- |
| French | Classics |
| German | Comparative Literature |
| Greek | English |
| Hebrew | History |
| Latin | Mediaeval Studies |
| Russian | Musi |
| Spanish | Philosophy |
|  | Religious Studies |
|  | Theatre |
| C. Social Sciences | D. Sciences |
| Anthropology | Biochemistry |
| Economiss | Biology |
| Political Science | Chemistry |
| Psychology | Geology |
| Sociology | Mathematics |
|  | Physics |

Classes are offered also in other subjects Architecture, Art History, Commerce, Com puter Science, Education, Engineering, Oceano-
graphy, and Humanistic Studies in Science.

## 3. Numbering of Classes

The Faculty is in the process of reviewing it system of numbering classes. Most classes are numbered with a three digit number; others,
however, are numbered with a four digit however, are numbered with a four digit
number. The following general criteria apply to both kinds of numbering. Students are urged to

## ${ }^{1}$ 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
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
introdyctory and can notlo introductory and can normally be taken by
fully matriculated students without any special 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
taken by students in the General Degree taken by students in the General Degree programmes, except with special permission of the instructor.

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 with the permission of the department or

The letters A, B and C suffixed to a three-digit class number indicate a half-credit class, i.e., a
class having one-half the value of a full class in class having one-half the value of a full class in
determining the standing of students. The determining the standing of students. The
letters indicate the terms during which the letters indicate the terms du
classes are offered as follows:
. First termered as follows
B: Second term, classes end in April.
A/B: Given in the first term and repeated in
the second term. Classes end in December or April according to the term in which the class is
taken. taken.
C: Spr
in the Spring.
in
soth terms, final examination
St in the Spring.

Classes with numbers below 100 do not carry redits but may be prerequisites for entry to backgrounds are deficient whose matriculatio

## 4. Programme Advice

4.1 Entering Students

Any student who wishes to declare his major at intial registration must consult with the depart ment concerned regarding his first-year pro amme
Students entering the King's Foundation Year Programme should consult the Director of the rogramme before registration.
. 2 Students who have Completed the Fir Year
very student entering the second year 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 maj Students seeking to enter an Individ
gramme (section 5.2.3 below) centrated Honours Programme or an below) must approach the Chairm Programme Advisory Committee assign an advisor or advisors and w

### 4.3 Prospective Teachers

Students considering teaching as a should before registering consult the of the Department of Education rega
programme of study. Those conside teaching should consult the Chairm Department of Music

## 5. Bachelor of Arts/Bachelor of

General: three years - 15 classes requir
5.1 The First Yea
5.1.1 Requirements
(a). Each full-time student planning
B.A. or a B.Sc. will in the first ye
B.A. or a B.Sc. will in the first year
take five classes or the equivalent take five classes or the equivalent, ch
groups A, B, C, and D. Year Programme is equivalent to fo for B.A. candidates or three classes candidates.)
(b) No student may in his first year credit more than the equivalent of credit classes in a single department.
selected from five classes chosen work in considered frequently whic These classes are approved by the C Committee and listed in the Progran ning Guide.
5.1.2 Recommendations

These recommendations do not apply dents entering the King's Foundat Programme.
(a) Students should seriously consider a class from a list of classes which de Planning Guide and has been approv Curriculum Committee.
(b) Students should consider becom in French.
(c) It is recommended that one class from each of the groups $\mathrm{A}, \mathrm{B}, \mathrm{C}$, and D . 5.1.3 Special Options
(a) A first-year student may (but $n$ be accepted by the chosen department registration. Such a student must con
partment King's Foundation Year Programme first-year student in Arts and Science ted introuuctis Programme the student enrolled at King's. Details are to be the Calendar of the University of llege, and advice may be obtained Director of the Programme
B.A. and B.Sc. - Requirements for dand Third Years

Requirements for d and Third Years who has sucessfully completed the may pursue a programme toward a degree or - if qualified - enter an programme. (Honours programmes are in section 5.3 below.) In the second years, three types of options are open

Programmes, which may be
any department in which it is obtain a General B.A. or B.Sc. In rogramme, the stucent must select a elective classes may be relatively

Leted Programmes offered by some
beparments or groups of related departments, rogramme requiring either one or two relatively concentrated study in the
ental or interdepartmental area ental or interdepartmental area of
needrogrammes, for students whose needs are not met by the foregoing
governing each of these options are
5.2.1 Ordinary Programmes (B.A./B.Sc.

The ten classes making up the course requirements:
least seven classes shall be beyond the
aast one class shall be in each of at least
least four and no more than eight all be in a single area of concentration
r).
to two of the classes in the major must be selected in accordance with
ntal or interdepartmental require utlined in the Calendar under Pros of Study. These requirements may ignate particular offerings of the depart-
(e.g. service classes) as unacceptable in g. service classes) as unacceptable in
ing a part of the major specialization.
5.2.1.2 On registration in his second year the
student must declare his major and have it student must declare his major and ha approved by the department concerned.
5.2.1.3 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.
5.2.1.4 For the B.Sc. the major subject must be chosen from biology, chemistry, engineering, geology, mathematics, physics, or psychology.
5.2.1.5 Electives may be chosen from any of the subjects listed in the preceding two parachemistry, not more than three classes in Commerce, Comparative Literature, Computer
Science, Education 401 or 402 Hebrew, Science, Education 401 or 402, Hebrew Humanistic Studies in Science, Mediaeval Stu dies, Religious Studies, and Theatre 100.

## 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-ordinatedprogrammes have been explicitly approved by programmes have been explicitly approved by
the Curriculum Committee. A department or group of departments offering co-ordinated programmes may structure them as it wishes consistent with sound academic practice and subject to the following guidelines:
(a) that the equivalent of five class units constitute a normal year;
(b) that the function of each programme form part of the Calendar description of each
(c) that each two-year programme permit the student at least one class of his own choice in each of the second and third years;
(d) that two-year programmes normally not be exclusively in a single discipline.
(e) that the normal prerequisite for entry into a departmental one-year or two-year pro gramme 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 Pro gramme should consult as early as possible with the departments concerned.
5.2.3 Individual Programmes (B.A./B.Sc. General) (B.A./B.SC A student whose academic needs are not met by the programmes offered under paragraphs 5.2.1 and 5.2 .2 may present two one-year or a Programme Advisory Committee for to the
hconcentrated programme must be accepted yy the Programme Advisory Committee, which mittee of two or more Faculty members to upervise the programme of study
5.3.2 Application for Admission
pplication for admission to an honours cours 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 B.Sc., or B.Comm. Degree ..Sc., or B.Comm. degree from Dalhousie and noth not enrolled in a programme of study in Horours gramme, or the B.Sc. in En B.Comm. pro programme. Regulations in paragraphs 5.31 and 5.3 .5 (or the regulations regarding the B.SC in Engineering Physics) must be met. On degree programe requirements of the Honour Physics), the student will receive a certificat which converts his General degree to Honours degree or B.Sc. (Engineering Physics), 5.3.4 Joit Ho Vincent
ecial arra Dalhousie-Mount Sais progray be permitted to pursue an hosors programme jointly at Dalhousie and Moun
and approval; it being understood that the Committee and/or Faculty advisor provide assistance in constructing and revising suc
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 either meet the requirements unde paragraphs major subject.
5.3 Honours Programmes

Able and ambitious students are urged to enter Honours Programme. These programme ntail a higher quality of work than that
required for the general bachelor's degree There are two types of honours courses oncentrated, involving a major concentratio in a single discipline or a combined concentr ation in two related disciplines; and unconentrated, involving breadth of study in several elated disciplines. A student may transfer from erious inconvenience. Students considering an onours course are advised to consult as soon as possible - preferably before their first registra ion - with the departments in which they may wish to do their advanced work.
5.3.1 Acceptance

Honours students in a concentrated programm must be accepted by the major department concerned, which will supervise their whole programme of study. Honours students in a

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er must either meet the requirements under
paragraphs 5.2 .1 or 5.2.3, and may declare a


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Saint Vincent．Interested applicants should consult the appropriate department of their own university and must be accepted by the major departments concerned at both institu－
tions．These departments will supervise the entire programme of study of accepted ap－ plicants．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 Programmes （a）Honours in a major programme are based on the general requirement that the 15 classes
beyond the first year of study comprise： beyond the first year of study comprise：
（i）nine classes beyond the 100 level subject（the major subject）；
（ii）two classes in a minor subject satisfactory to the major department；and
（iii）four classes not in
（iii）four classes not int 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）eleven classes beyond the 100 level in two allied subjects，not more than seven classes being in either of them；
（ii）four classes in subjects other than the two
offered to satisfy the preceding clause．
（c）At the end of a concentrated honours
course，a student must pass a comprehensive course，a student must pass a comprehensive examination covering his honours work and he must attain an average of not less than B－in the
classes in the two disciplines in which he has concentrated；attainment of an average of at least A －in this examination and these classes is required to obtain First－Class Honours．
Details of specific departmental honours pro－ grammes will be found under departmental listings of Programmes of Study．

5．3．5．2 Unconcentrated Honours Programmes （a）Honours in the unconcentrated pro grammes are based on the general requirement hat the fifteen classes beyond the first year of tudy comprise：
（i）twelve classes beyond the 100 level in three may be in a single subject；no less than six and no more than nine may be in two subjects．
（ii）three other classes．
（b）Requirements for an Unconcentrated B．A （Honours）
e selected classes of the twenty required must be selected from groups $\mathrm{A}, \mathrm{B}$, and C ．
（c）Requirements for an Unconcentrated B．Sc （Honours）
least eight classes of the twenty required must be selected from biology，chemistry， geology，mathematics，physics，and psy chology， and at least six additional
selected from groups $C$ and $D$ ．
da）At the end of an unconcentrated honours ligher a student must obtain a grade of B－or examination regarding his or a comprehensive addition，he must attain an averazas work．In required advanced classes which comprise his honours programme．Achievement of an aver age of at least A－on the honours essay or examination and in the required advanced classes is
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 Degree from Dalhousie and qualifies for admis－ sion to the junior year of the Nova Scotia
Technical College．Students who plan to sudy Technical College．Students who plan to study
further at a college other than the Nova Scotia Technical College should consult the Depart ment of Engineering and Engineering－Physics on initial registration．See also Architecture below．
Details of the curriculum are given under Engineering and Engineering－Physics in Pro－
grammes of Study．

7．Bac
Physic
Four years－ 21 classes required．
This special course is based on a study of physics oriented towards its application to
engineering problems．It is desiged students more applied mathematics than is contained in the ordinary physics course． Students are also given an opportunity to speciaize in such fields as electronic systems engineering，semiconductor engineering，under－ water pletion of the course is excellent preparation for a career in industrial research or for graduate study in applied sciences．

Details of the curriculum for the course are given under Engineering and Engineering－

8．Bachelor of Commerce
General：Three years－ 15 classes required Honours：Four years－ 20 classes required．

For 1970 and subsequent years new students will enter a revised programme which may permit some concentration in one of several
fields of business studies．Students planning to follow a concentration programme should con－ sult the Department of Commerce prior to registration．
（a）The Institute of Chartered Accountants most provinces in Canada offers exemptions to countancy．
（b）The Scoiety of Industrial and countants offers exemptions to gra the Diploma in Registered Industri ney
 Details of the curriculum for the for the Honours degree courses are
Commerce in Programmes of Study． －Ben ntegrated（with General B．A．or $A$ Integrated（with General B．A．or $B$
rears－ 21 classes，plus field required． Integrated（with Honours B．A．or B．
years -26 classes，ples． years－ 26 classes，plus field
required． Sequential：one year
equential：one year
（Elementary） 7 clas
required．
（Secondary） 6 classes plus field required．
In the integrated course，classes in are taken concurrently with classes tion，the B．Ed．and the B．A．or B．Sc．
In the sequential course，classes in are taken only after completion of a arts and science．Candidates for adm
this course must have received the B．A．，B．Sc．or B．Com．from a university recognized by the Senate purpose．
By arrangement with the Nova Scotia Deprut ment of Education，students completin of these courses in education may
Teacher＇s Certificate（Class 5）．B courses are divided into two types， and Secondary

10．Bachelor of Music Education
Four years－ 20 classes plus practice

## equired．

By arrangement with the Nova Scotia ment of Education，students comp course are awarded a Teacher＇s （Class 5）．Details of the curricu requirements for admission to the

## 11．Certificate in Public Administ

One year－five classes plus standing i Science 100 or its equivalent．

A programme leading to the Cer
Public Admine who meet the admission require
or are enrolled in a programme 12．1 Entrance Requirements first degree．Those not meeting the ission requirements may apply for as a Special Case（see Admissions， review applications for Political provision and make recommenda－
quisite Requirement Political Science 100 or its equival－
ramme Requirements
ramme Requirements
nment of Canada（Political Science
comics：
Administration（Political Science
two other classes in the social
osen in consultation with the De－
four of the five classes in the e must be taken at Dalhousie Univer－ ept for the prerequisite class，credit student has registered in the pro－
taken for the Certificate may be ted toward a bachelor＇s degree，but a
must complete at least five of the must complete at least five of the
required for the degree after the award ertificate．
programme and the Certificate pro－
programme and the Certificate pro－
cannot be taken concurrently cannot be taken concurrently．A gistered in a Certificate programme， Certificate in Public Administration be awarded for work taken as part of a degree

12．Dentistry
requirements for admission are set
the Calendar of the Dalhousie Univer－
ulty of Dentistry．Candidates are
do to proceed to a Bachelor＇s degree
eking admission．

At a minimum，applicants pursuing a pre－dental course in the Faculty of Arts and Science are required to have completed ten classes during regular he Faculty of Dentistry
namely：Endishe ten classes are imperative namely：English 100；Physics 100；Biology 1000 or 200；Chemistry 110 and 241 ．
（b）Credit for the remaining five classes may be obtained in either of the following ways：
（i）by the successful completion of three
classes chosen from the humanities and the social sciences plus two other elective classes． （ii）by Bachelor＇s degree．
12．2 Dental Aptitude Tests
All Canadian applicants must submit test results from the Canadian Dental Association Dental Aptitude Testing Programme．Applicants from
other countries may submit the American other countries may submit the American
Dental Association Dental Aptitude Testing Dental Association
Programme results．

## 13．Medicine

Detailed requirements for admission forth in the Calendar of the Dalhousie Univer sity Faculty of Medicine．The majority of students accepted for admission to that Faculty have a bachelor＇s degree，but this is not requirement．

13．1 Entrance Requirement
At a minimum，applicants pursuing a pre－ medical course in the Faculty of Arts and
Science to which they have been admitted on Science to which they have been admitted on
the basis of Nova Scotia Senior Matriculation （or the equivalent）including credits in English and mathematics，are required to have com－ pleted ten classes in a regular degree programme entrance．
（a）Five of these classes are imperative
 110 ．
（b）The remaining five classes must include at least two in a single subject．Ordinarily these five electives should be chosen from the
following：anthropology，biology，chemistry classics or classical languages，economics，
nglish，history，mathematics，modern langu ses，philosophy，physics，political science sychology or sociology．
In choosing electives pre－medical students are generally well－advised not to anticipate medical school subjects such as bacteriology，bio－ hemistry，histology，and physiology at the expense of fundamental training，but for students intending to specialize within the medical sciences，an honours degree in one of
these fields or in biology，chemistry or physics may prove advantageous．

13．2 Medical College Admission Test Results of this test must be submitted by al applicants．

## 4．Architecture

Qualification for entrance to the School o Architecture at the Nova Scotia Technica College is the satisfactory completion of at leas two years at any university or equivalent
institution of recognized standing．A university course in mathematics is prerequisite，excep hat the applicant may instead be required to take a written examination in this subject．
Providing it has been undertaken at a re cognized university，virtually any course of
studies，including arts，fine arts，engineering and studies，including arts，fine arts，engineering and
other technologies，science，agriculture，socia sciences，education，medicine，is acceptable．
A candidate for admission to the first year in rchitecture should submit to the Registrar o
he Nova Scotia Technical College by July 4 the following documents；（a）an application form obtained from the Registrar，NSTC；（b）an official transcript of his university record；（c） letter of recommendation from some person o cademic rank with close personal knowledge

## 15．Design

Students successfully completing one year of ．A．programme in the Humanities at Dalhousie aur－year printed into the second year of the Design degree in leading to the Bachelor of Environmental Design at the Nova Scotia College of Art and Design．

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## Programmes of Study

## African Studies

## Professors

J．E．Flint（History）
K．A．Heard（Political Science）
Z．A．Konczacki（Economics）
J．B．Webster（History）
Associate Professors
P．D．Pillay（History）
Assistant Professors
J．Barkow（Anthropology）
T．M．Shaw（Political Science）
J．E．Sorenson（Music）
The programme in African Studies offers students an opportunity to integrate classes from a number of disciplines around the focus
of one major world region．Students wishing to of one major world region．Students wishing to
read towards a B．A．with a concentration on read towards a B．A．with a concentration on
African Studies should note the following recommendations and regulations．

I It is strongly recommended that in the first year students should read three of Anthropo－ logy 100，Economics 100，English 100，History

II 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） （direct focus on Africa）
（c）A further two classes must be chosen from
List I or List II the latter list being classes concerned with the problems of development and underdevelopment．
（d）Two of the ten classes must be at the 300 level．

200 African Studies
This class is intended to provide a detailed study of one African region．During the 1973／74 academic year East Africa will be studied．The study will involve several dis－
ciplines．The class will consist of two lectures ciplines．The class will consist of two lectures
per week plus one evening session per month， Students will be graded on the basis of three essays written during the course of the year and chosen from at least two of the disciplinary sections plus satisfactory attendance．The class
will consist of approximately six lectures in will consist of appr
each of the following

1．Ethnography of East Africa；J．Barkow
（Anthropology） （Anthropology）
2．Pre－Colonial History with Special Emphasis on Uganda，J．B．Webster（History）

3．Imperial Intrusion \＆Impact on East Africa； J．E．Flint（History）

4．Economic change from 1890 to the Present，Economics 423A，International Ec Z．A．Konczacki（Economics）
5．Contemporary Politics of East Africa；K．A Heard（Political Science）
$\begin{array}{ll}\text { 6．East Africa and the International System；T．} & \begin{array}{l}\text { History } \\ \text { Empire，P．Burroughs，M．Reckord }\end{array} \\ \text { M．Shaw（Political Science）}\end{array}$
7．The East African Novel；R．J．Smith History 337，Cuba and the Carib English）

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

Anthropology 316，Africa：Ethnography \＆ Modernization，J．H．Barkow．
Economics 234A，Pre－Colonial History of Sub－ Saharan Africa，Z．A．Konczacki．

Economics 235A，Economic History of ropical Africa：Colonial Period，Z． onczacki
Economics 236B，Recent Economic Develop－ nent in Sub－Saharan Africa，Z．A．Konczacki

English 217，African Literature in English，R．J． Smith．
History 240，Tropical Africa in the Nineteenth $\stackrel{\&}{\text { \＆Tw }}$

History 344，Oigms of Thibaism and Natio lism in Africa，J．B．Webster
History 345，History of South Africa，P．D． Pillay．
Political Science 317A，Foreign Policies of 101B Survey of the History of Art， African States，T．M．Shaw
Political Science 317B，Politics in Africa South of the Sahara，K．A．Heard．

Political Science 318，The Politics of South Africa，K．A．Heard，（Not offered in 1973／74）．
olitical Science 324，Problems of Develop ment，K．A．Heard and T．M．Shaw．

## LIST II <br> ．B．Macphers

nnthropology 301，Peasant Society and D．W．Russell
Anthropology 306，Social Organizations of Anthropology 306，Social Org

Economics 333A，Theories of Economic De－
elopment，Z．A．Konczacki．

D．Wainwright
Associate Professors
A．．Blair
A．H．Blair
F．I．Maclean
F．B．Palmer
F．B．Valmer
J．Verpoorte
－
Economics 424B，Economic Reckord．

Music 301，Music
tion，J．Sorenson．
Political Science 321，Internation and Trans－National Organization，T

## Sociology 206A，Social Change and $M$ tion，H．V．Gamberg．

Sociology 306B，Socio－Cultural Ch ernization and Development，J．J．M

Anthropology see Sociology and Anthropology

## Art History

## ssistant Professor and Director

 GalleryE．Smith

## Classes Offered

01A Survey of the History of Art，lect：： 2 E．Smith
end of the 18th $C$

The 19th and 20th centuries：
painting，sculpture，architecture and

## Biochemistry

## Professo <br> Professors

er（Chairman）

The results of biochemical research are ap－ plicable in almost every aspect of life．The functioning relas its microorganisms to the needs of agriculture and of animals，and helps to design pesticides and fertilizers，additives and substitutes．The drug，fermentation and food processing industries，to name but a few，rely heavily on biochemical techniques and know－ ledge．Much of fundamental biology is bes
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 explana－ tions 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 em ployed？In Canada，most of them work in universities，in agricultural research，or in
government or hospital laboratories；some are government or hospital laboratories；some are
employed in industry．Training to the B．Sc level enables one to work as a technician o 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． scienc
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．The depart ment has exceptionally up－to－date equipment and almost all current biochemical interests can be handled．

Degree Programmes
The study of biochemistry requires a prio knowledge of elementary biology，mathematics and physics，and a good grounding in organic and physical chemistry．Accordingly，the hon－
ours 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 no concentrating in biochemistry，but who wish to include a class in biochemistry in their pro－ fourth year．They should ensure that th 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 aim to provide the student with the background
necessary for graduate work in biochemistry
and allied fields．It is also a suitable preparatio Ior the study of medicine or dentistry．Becaus
the chemical content of all branches of hiolog is rapidly increasing，biochemistry can be recommended as a starting point for a career in

## Year I

Year II

Year III
many fields of biology．
Three major programmes in biochemistry are outlined below，with minors in biology，physic comprehensive examination in biochemistry at the conclusion of their period of study．
－2．Two electives from groups A，B or C，but not both from the same group．
4．Chemistry 110 ．
Minor in Biology
Biology 200
Minor in Physics
5．Physics 110.
Minor in Mathematic．

Y．Chemistry 230.
Minor in Biology
8．Elective
10．Two Biology half classes $(2020,2030$ 2040，or 2050）or one Microbiology class．

Minor in Physics
8．Biology 2000
10．Physics 221 or 222 ．
Minor in Mathematics
8．Elective．
10．Mathematics 200 ．

11．Biochemistry 302 ．
13．Additional Chemistry class．
Minor in Biology
14．Elective
14．Elective
5．Additional Microbiology or Biology class
Minor in Physics
5．Additional physics class．
Minor in Mathematics
14．Elective．
hematics class
emistry 403A and 403B．
17．Biochemistry 406A and 406B．
18．Biochemistry 407A and 407B．
．Additional Biochemistry or Chemistry
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Minor in Biology
Minor in Physics
Minor in Physics
20. Additional bi
0. Additional biology or microbiology clas
0. Additional biolog

## Classes Offere

302 Introductory Biochemistry, lect.: 2 hrs.; ab.: 3 hrs.; A. H. Blair/M. W. Gray/F. B
his class is designed to introduce the studen o the various aspects of the general field
biochemistry.
pproximately half the class is devoted to tudy of the structures and chemical and iological properties of the molecules of which
ving things are composed. These include the biological macromolecules: polysaccharides, roteins and nucleic acids. The properties o nzymes as catalysts and the basis of the ctivity are discussed.

The remainder of the class deals with inter mediary metabolism: the pathways of trans ormations which molecules undergo in the iving organism. These pathways provide for the generation of usable energy, and for the
utilization of this energy for the synthesis of new molecules characteristic of the organism. Finally, the class includes an introduction t iochemical genetics: the means by which the living cell specifies the structures of the escendants.

This class, or an equivalent one, is a prerequisit o more advanced classes in biochemistry nrolment is limited to about 40 .
rerequisite: a class in organic chemistry; it will tructures 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 thi class if he has some prior knowledge o emical equilibrium, pH and elementar

403A Intermediary Metabolism I, lect.: 2 hrs. M. S. DeWolfe/C. Mezei/F. B. Palmer.

This class is intended to expand and comple ment the study of metabolism begun in the introductory class. Topics previously in
troduced are studied in greater detail and complexity. These are supplemented by selection of more specialized topics of par ticular interest. Emphasis is placed on the metabolic systems and, wherever possible both cyclic and non-cyclic systems are examined fo mechanisms by which the control and direction of metabolism are achieved. The material is taken from the recent scientific literature and is principally concerned with aspects of car
bohydrate and lipid metabolism in animals, plants, and micro-organisms. Also discussed are
the biochemical
mission in nerves. class in basic biochemistry

403B Intermediary Metabolism II, lect. 2 hrs. M. S. DeWolfe/F. I. Maclean/C. Mezei.

The intent of this class is the same as that for 403A; however it may be taken independently. Two broad subject areas are covered. The metabolism of amino acids is described in some
detail and is followed by a consideration of protein synthesis. Controlling factors at all stages are emphasized. The second portion of the course is devoted to a study of energy generating systems and the metabolism of their important components. A consideration of the which occur throughout nature is presented which includes the details of the oxidative and photosynthetic phosphorylation systems as well as some fermentative pathways.
Prerequisite: Biochemistry 302 or an equivalent class in basic biochemistry

406A Advanced Instrumentation Techniques, lab.: 6 hrs.; J. A. Verpoorte.

Instruction is provided for advanced students in the use of instrumentation. The principles and The class of the equipment will be discussed. tometers, a spectrofluorimeter, atomic absorp tion spectrophotometer, spectropolarimeter, automatic titration equipment as well as ${ }^{\text {ultracentrifuges. }}$
Prerequisite: Biochemistry 302 or an equivalent class in basic biochemistry

406B Experiments in Metabolism, Lab.: 6 hrs. M. S. DeWolfe/F. I. Maclean/C. Mezei/F. B.

This laboratory class is designed principally to provide some practical experience with subjects developed theoretically in Biochemistry 403. Hoowever, it mas be taken by anyone with a onts are chosen to of biochemistry. Experiments are chosen to illustrate the mechanisms of metabolic control at the molecular level in
systems of varying complexity from the whole animal to isolated enzymes. In the course of these experiments the student will be expected to become familiar with the principles under lying the methodology employed and to par ticipate in the design of the experiments.
Prerequisite: Biochemistry 302 or an equ class in basic biochemistry.

407A Physical Biochemistry, lect.: 2 hrs.; J. Verpoorte
Selected aspects of the chemistry of biological macromolecules, mainly proteins. Topics instructure and biological relationship between orces in maintaining structure as well as chemical and physical methods for studying
polymers.

Prerequisites: A basic class in bioche in physical chemistry
407B Physical Biochemistry, lect.: 2 Blair/J. A. Verpoorte.

The first part of this class deals in a $g$ with the binding of small molecules, hydrogen ions, to proteins. The seco
devoted to a study of the kinetic devoted to a study of the kinetic pro enzymes and how the binding reguatory substances influences ki control of cellular metabolism. The re between the structure of catalytic gulatory sites and their function wil considered for selected enzymes, Prerequisite: A basic class in biochemi

Biology
Professors
C. M. Boyd (Oceanography)
F. R. Hayes (Killam Senior Fellow)
O. P. Kamra
K. E. von Maltzahn
K. H. Mann (Chairman)
I. A. McLaren
E. L. Mills ( 0
J. G. Ogden
E. C. Pielou (Killam Research Professo
G. A. Riley (Oceanography)
L. C. Vining

Associate Professors

## E. W. Angelopoulo

R. G. Brown
R. W. Doyle
J. Farley
E. G. Garside
L. E. Haley
B. K. Hall
M. J. Harvey

Associate Professor (Part-time)

Assistant Professo
A. R. O. Chapman
J. V. Collins
G. S. Hicks

Research Associate
D. Brewer
D. Brewer
T. Platt
D. P. Pielou
S. Russell
J. Mortenson
J. Mortenso
M. Yoon

## Research Fellows

J. Wright

## loctoral Fellows <br>  <br> ${ }^{6}$ o. Prasad

gramme in biology is designed to the student with an understanding of hings. Understanding of the biological is so important for us because we are part We carry to a large degree the responsi-
for the state of the biosphere and we can for the state of the biosphere and we can ourselves to it.
gramme offered by the Departmen so a basic training in the biological which may serve as preparation for
and professional work in biology, dentistry, pharmacy, the health pro bioengineering and education; in re, aquaculture, forestry and environ
chitecture and engineering.
Degree Programmes
The Department offers classes leading to the ral B.A. and B.Sc. degree in biology and to a concentrated or combined Honours B.Sc. programme. A student intending to study
biology as his main subject is asked to consult ogy as his main subject is asked to consult
Department early in his course so that a rroper programme can be worked out.

## Honours in ate Study.

in Biology and Preparation for Gradu-
For entrance to graduate school an Honours
equivalent four-year bar Honour
Some graduate schools require knowledge of French, German or A thorough grounding in mathematics ysical sciences is as important a
undergraduate training in biology.
ts reading for a Bachelor of Science with honours in biology must satisfy the requirements for honours degrees and their course programme as early as posible in
During th
the first three years of a programme of
concentrated honours, students are advised to follow one of the programmes shown in the will be selected to meet the honours require ments and will normally include Biology 4900

For some graduate programmes, a combined or unconcentrated honours programme may be he best preparation. Advice on this matter may obtained in the Department.
tudents having a special interest in Marine Ecology are advised to obtain a good under graduate training in general biology, mathe atics and physical sciences, and specialize in ?

Honours students must pass a comprehensive of study.
eneral B.S. or B.Sc. Programme he Biology department offers 1,2 and 3 year for entry to these programmes is $75 \%$ in Grad 2 Biology (or equivalent). Those who have not met this requirement must first take Biology 1000 . There are 3 possibilities (see table following)
(i) A qualified student who elects to con entrate in Biology from time of entry to the University will take 3 years of the programme. In the second and third years this involves either choosing an area of specializatio molecular, developmenta, environmental or mion
(ii) A student may take a general cour distribution in the first year of university, and hen take Years I and II of the Biology Programme.
(iii) A student may take Year I of the Biolog rogramme in second or third year in the University.

There are additional possibities. A sude
may elect to follow a general degree with
concentration in biology, under the genera aculty regulations, or may design a specia Committee on Studies.

Classes Offered
$A$ class number that is suffixed by one of the comments on these classes under the heading Numbering of Classes under Degrees and Courses).
Biology class offerings may be grouped into fiv general types:

1. Introductory biological principles - Biology 1000. This class is designed for students wit no previous biology or for students in the health sciences or
overview of biology
2. Classes for those students who do not intend o take biology as their area of conentrion Biology 1060 A and 1400 B . These classes do not serve as a prerequisite to other biology classes.
3. Core classes - These consist of a full-ye class Biology 2000 and six half-year classes form the basis of Biology class offerings. It ecommended that a student who takes biology as his area of concentration complete as many classes as possible
4. 3000 -level classes - Intermediate classes 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 $3000-$-evel classes are oncerned particularly with principles in biology.
5. $4000-$-evel classes - These classes are pri marily for honours and graduate students. They re open to others with permission of the

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Biology - 3 year programme of guided study

| Year I | Prerequisite: 75\% in Grade 12 Biology or Biology 1000 <br> 2 or 3* credits chosen from: Biology 2000 and Biology 2010 to 2060 (half classes) <br> 1 or 2 credits chosen from: Math 100 , Chemistry 110 , Physics 110 or other science by agreement <br> 1 elective |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | General Biology Counsellors A. R. O. Chapman L. E. Haley | Molecular Biology Counsellors W. C. Kimmins L. C. Vining | Developmental Biology <br> Counsellors - <br> B. K. Hall <br> G. S. Hicks | Environmental Biology <br> Counsellors - <br> J. G. Ogden <br> R. W. Doyle | Microbiology Counsellors R. G. Brown D. E. Mahoney |
|  |  | Prerequisite <br> Bio. 2010A or B; <br> Chem. 110 | Prerequisite 2030A or B; 2050A or B; Chem. 110 | Prerequisite 2040A or B; 2060A or B; Math. 100 . | Prerequisite Bio. 2010A or B; 2030A or B; Chem. 110 |
| Year II | 1 credit from: Bio. 2010-2060 | 3 credits from: Bio. 3010A, 3011B 3012A, 3013B, 3030B, 3110A | Bio. 3050A, 3031B | Bio. 3061 or 3063 | $\begin{aligned} & \text { Bio. 3110A + 3111 } \\ & (=\text { Micro. 302) } \end{aligned}$ |
|  | 1-2 credits from 3000 level classes | Chem. 241 | $1 \frac{112}{2}$ credits from biology electives | 1 credit from Bio. 2010-2060 | Bio. 3010 |
|  | 1-2 other sciences 1 elective | 1 elective | Chem. 241 <br> 1 elective | 2 credits from Ocean. <br> 200 Geology | $1 / 2$ credit from Bio. 2010-2060 |
|  |  |  |  | Math 106 ( $1 / 2$ credit 203 ( $1 / 2$ credit), another science. | Chem. 241 |
|  |  |  |  |  | Physics 110 |
|  |  |  |  | 1 elective | 1 elective |
| Year III | 2 credits from Bio. 3000 or 4000 level | 2 or 3 classes from Bio. 3031B, 3050A, 3213B, 4010, 4115, 4214. | Bio. 3012A or 3213B | Bio. 3061 or 3063 1 credit from | Bio. 30118 |
|  |  |  | Seminar in Devel. | Bio. 2010-2060 or | Bio. 4033A |
|  |  |  | $11 / 2$ Bio. electives | 1 other Bio. or | Bio. 4113 or 4114 |
|  | 2 credits from Bio. or other sciences | Biochem. 504, 508 |  | 1 other science | Bio. 4115 or 4010 |
|  |  |  |  | Ocean. or Geology 1 Mathematics | 1 credit from Bio. 3112B, 3322B |
|  | 1 elective | 1-2 electives as needed | 1 elective | 1 elective | 4116 A , or Math. 106 ( $1 / 2$ credit). 1 elective |

## *A maximum of 2 for first year students.

Introductory Classes Offered
All students registering for a biology class fo the first time should read the following regulations carefully before completing registra
tion.
(a) Course 1000 is designed for, and must be taken by, those who did not take, or scored less than $75 \%$ in, Grade 12 Biology. It thus serves as to progress to other offerings in the Biology Department.
(b) Students who have achieved $75 \%$ or over in Grade 12 Biology will take Biology 2000 o 2040 A or B; 2050 A ; 2020 A or B; 2030A or B
(c) Students who receive credits for 2010A o B, 2020 A or B, 2030 A or B, 2040 A or B, 2050 A or B , or 2060 A or B in their first year year.

1000 Principles of General Biology, Study Centre 3 hrs.; Tutorial Quiz $1 / 2 \mathrm{hr}$.; Lecture I. Harvey, R. P. Mc Bride.

Biology 1000 is now 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 traditional lecture no longer has and but the importance in the system; this latter time slot is used for question-and-answer session, class tests and the occasional lecture.

The subject matter puts emphasis on those features common to all or large groups of
organisms. It thus contrasts with Biology 2000 organisms. It thus contrasts with Biology 2000 than the major differences between groups. The course starts by considering the basic functions of whole organisms, studying a typical plant and a typical animal. Then the organism is examined in finer and finer detail considering
the structure of cells, cell chemistry, This leads to the topics of genetics, ecology and systematics.
The following two classes are for stud do not take biology as their area of co

## 1060A Environment and Man, Lectur

 Tutorial 1 hr .; K. H. Mann.Human modifications of natural life have now reached a point where effec seen on a worldwide scale. The cour with a consideration of global envir problems and of the ecological proces must be understood before better ma examples of environmental problems discussed. Seminars are used to re detailed evidence for the board gener and to discuss changes in social and
attitudes which may be required befor
introduces basic concepts in genetics ss ition, and uses these to examine the of living organisms and how they One particular aim of the class is to
man as part of the living world and to the impact of genetic and evolutionary man's past and future. The class is as a series of lectures and tutorial
during which students discuss topics on during which students discuss topics on
hey have done independent reading, e.g. ey have done independent reading, e.g. daptation of organisms to specific ments. Students are also required to number of essays on assigned topics, o the general themes of the discussion.
owing classes are core classes in the biology programme. Students cong their studies in biology may want to Il of these classes in their programme
ersity of Organisns, lect. 3 hrs.; Lab. 3 A. R. O. Chapman.
s is concerned with the great variety of hings, from viruses to higher plants and some knowledge of classification and nary relationships of major groups. The not simply a survey of diversity, as portant anatomical, physiological, and ental principles are derived from the ive approach in biology.
$s$ are advised to take this class early in ogramme of biology classes, since some ge of diversity of organisms is required classe

2010 A,
3 hrs;
Ruseell
Molecular Biology, Lect. 3 hrs.; Lab. C. Kimmins, L. C. Vinning, S. L.
forms a bridge between biology and ry. Beginning with the structure and
jes of the elements it explores the r organization of the living world in physical and chemical laws. Students ire an introductory knowledge of the $y$ of cell constituents, and of the cal basis of life, growth and heredity.
cture and function of proteins and e as enzymes catalysing essential rocesses is developed in greater depth.
biology seeks to explain the com living systems as a logical conof the fundamental properties of
students to some of the equipment, techniques, and deductive reasoning used to explain bio gical pheno recular leve.

Background in chemistry is essential Texts: Loewy and Siekevitz, Cell Structure and anction 2nd edition, 1969. Kimmins, Vining and Russell, Practical Biological Chemistry,

2020A/B Cell Biology Form and Function Lect. 2 hrs.; Discussion 1 hr.; Lab. 3 hrs.; M. L. Cameron, J. V. Collins.

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 Lectures correlate the findings of lig

Laboratory work is integrated with the lecture material and includes the theory and practice o light microscopy, staining and histochemistry, and observations on cell division and chromo ome structur
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 group discussions.

2030A/B Genetics, lect. 3 hrs.; Lab. 3 hrs.; L. E. Haley, O. P. Kamra.

The following three questions will be discusse this class: (1) What is the nature of the genetic material, i.e. the structure and functio of DNA; (2) How is the genetic information ransmitted from one generation to the nex Text: Levine, Biology of the Gene

2040A/B Evolutionary Biology, Lect. 2 hrs.; Tutorial 2 hrs.; R. W. Doyle.
A study of evolution as the interaction of genetic and ecological processes. The first half
of the class introduces certain areas of popula of the class introduces certain areas of popula
tion and biometrical genetics, an explicit statement of natural selection and an ecological model of population growth and competition In the second half of the class these ideas wil be applied to the problem of the origin of new species in space and time, to aspects of human ion of complex life cycles and to the evolutio of the genetic system itself.

There are two lectures and a tutorial every week with a problem set or paper due at each tutorial. A thorough grasp of Mendelia 101 level will be assumed from the beginning there are no other prerequisites although experience indicates that the background provided by Biology 203 may be helpful.
2050A/B Developmental Biology, Lect. 2 hr Lab: 3 hrs.; B. K. Hall.
his class discusses the principles of both pla and animal development, emphasizing the ex perimental approach. Opportunity is given analysis of development: Topics covered in clude: factors initiating development; embryogenesis; typical developmental patterns analysis and regulation of growth and ageing ell specialization and its possible reversal. ext: J. D. Ebert and I. M. Sussex, Interacting Systems in Development,
Rinehart and Winston, 1970).

2060A/B Ecology, lect. 2 hrs.; Lab. 3 hrs.; J. C. Ogden III.
The lectures offer an overview of ecology considering in order the ecology of individuals the regulation of numbers in single-specie populations, various interactions among suc populations, and finally the complex intera denelopment of in the structure, function, and give some inifh cosystems. The laboratores give some insight into techniques and modes dependent projects by students.
Text: Kormondy, Concepts of Ecoloyg; Odum Ecology.

Intermediate Classes Offered
Intermediate classes are mainly for second and third-year students. They may be taken before completion of the core of classes described bove. Merse prequisites he classes listed below.

010A Metabolism I, Lect. 2 hrs.; Lab. utorials: 1-3 hrs.; W. C. Kimmins, R. G. Brown.
The pathways of degradation and synthesis The pathways of degradation and synthesis of ion of energy
Preqequisite: Biology 201A or B.
3011 B Metabolism II, Lect 2 hrs. Lab Tutorials: 1-3 hrs.; L. C. Vining, R. G. Brown.
nformation transfered and control metabolism within the cell. The mechanism of gene action; role of nucleic acids and proteins. rerequisite: Biology 201A or B.

30124 Animal Physiology sion 1 hr.; Lab. 3 hrs.; J. V. Collins.

The theme of the course is regulation of the internal environment of cells and organisms. The control of intracellular and extraceliur normal functions are considered. The approach is comparative, equal emphasis being given to animals at all levels of complexity. Laboratory classes are designed to demonstrate experinental approaches to problems discussed lectures.
Prerequisites: Biology 200, 202A/B

3013B Plant Physiology，Lect． 2 hrs．；Lab． eminarsell．
Lectures and discussion groups will deal in depth with some of the physiological functions in relation to the environment．

## Course Outline：

1．Exchange of materials between plants and Exchange of materials between plants and
he environment and distribution through the plant．
．The eff
rerequisite：Biology 200 ．
3030B Molecular Genetics，（74－75），Lect． 2 hrs．；Lab． 3 hrs．；L．E．Haley．

The replication，transmission and control of genetic information in various organisms from iruses to higher cells．
Terequisite：Biology 203A or B．
031B Developmental Genetics，Lect． 2 hrs． Lab． 3 hrs．；L．E．Haley

Will deal with those aspects of gene action hich are involved in developmental processe especially differential gene activity．
Prerequisite：Biology 203A or B，205A or B． 3050A Development and Morphogenesis
Animals，Lect． 2 hrs．；Lab． 3 hrs．；B．K．Hall．
This class assumes the material of Biology $205 \mathrm{~A} / \mathrm{B}$ as background and studies the mech orphogenesis and growth in animals．Topic of studies include：descriptive embryology of nvertebrates and vertebrates；mammalian de elopment and its hormonal control；histo genesis and morphogenesis of tissues and ellular differentiation；aspects of metamor phosis．

The laboratory classes emphasize the exper ental approach to the lecture topic
rerequisite：Biology 205A or B．
3061B Structure and Function of Ecosystems I ect． 2 hrs．；seminar 1 hr．；M．J．Harvey，R． McBride，K．H．Mann，J．G．Ogden II
Utilizing a systems approach to production， decomposition，respiration，and nutrient cycling in terrestrial and aquatic ecosystems， this course surveys both methods and results of
tudies in a variety of ecosystems．Seminars wil be devoted to a review of specific investigation eported in the literature，emphasizing tech niques and data manipulation．
B，Math 100 or 150 3062A Structure and Function of Ecosystems
II，2－week field course prior to beginning of
classes；lab． 3 hrs．during Fall Term．M．I Harvey，R．
Ogden III．
Intensive two－week field study（Labour Day to beginning of term）emphasizing sampling tech－
niques and data collection in a selected habitat． Field work includes surveying and mapping of topography，soils，vegetation，and bathymetry of lakes or ponds；stream flow measurement， characterization and analysis of plant and
animal communities， animal communities，microclimatology，
chemical and calorific measurement of biotic and abiotic components．Laboratory work during the fall term is continued on samples collected during the field work and leads to a paper on some aspects of community analysis． Prerequisite：Biology 36

3064B Seminar in Population Biology，seminar 2 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 cover a broad range extending，for
example from competition among phytoplank－ example，from competition among phytoplank－
ton species in tropical oceans to the＂biological species＂problem to the genetics of human racial differences．Suitable for 3rd and 4th year undergraduates and graduate students who have obtained a grade of B or better in Biology 2040 A or B，Biology 2060A or B and Math 100
as essential prerequisites（others with equivalent or special qualifications should see the in－ structor）．The research literature is the only text．Seminars every week or two plus about five essays．
Prerequisites：Biology 204A or B，206A or B， Math 100 or 150 ．

3063 Theoretical Ecology，lect． 2 hrs．；lab． 3 hrs．；E．C．Pielou．
This class considers ecological problems whose solution entails mathematical reasoning．Discus－
sion of recent research will illustrate with variety of examples from both plant and animal ecology，the whole sequence of steps that an investigation follows：this starts with formula－ ting a problem and deciding what observations would lead to a solution；then follows the
planning，performing and analysing of the planning，performing and analysing of the
observations and finally the drawing of con－ clusions．Emphasis is given 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 151．Other mathematical topics will be ex－
plained as they arise；the time to be devoted to plained ais 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 Methods in Biology is required reading．Biology 206 A or B．

3110A Bacteria，Viruses and Fungi I，lect． 2
hrs．；lab． 3 hrs．；R．Brown．

A comparative study． Prerequisites：
203 A or B．

3111B Bacteria，Viruses and Fungi
hrs．；lab． 3 hrs．；R．Brown，R．P．McBr hrs．；lab． 3 hrs．；R．Brown，R．P．McBr Study of their physiological and characteristics．Admission to 31118
the completion of 31104 （he completion of 3110A．The ＂microbial world＂．In so doing，the three questions are considered：

What are micro－organisms？In deci microbes are one must compare
other living organisms and with other living organisms and with e
Consequently，a comparative study organisms based on morphological， gical，developmental and chemical
tions is made in the first term．The delimit the microbial world．

Where are micro－organisms found？ answer to this question one turns to ecology．Microbial interaction with
ganisms is important ganisms is important because of th phytic and／or parastic nature．To de
this interaction，topics such as nitrogen fixation，ruminant diges disease are discussed．
Finally，what do microbes do？Bird insects and seeds，etc．Without see
how do we know that present？To illustrate the diversity of action，selected metabolic activities organisms are considered at the mole
Students entering this class should ha classes in organic chemistry and cell although students taking
currently will be admitted． Prerequisite：Biology 311A．

## 3112B Microbial Ultrastructure，（1973

 EasterbrookA half－class in ultrastructure．The programme will center around the microscopic unit of the Microbiolog
ment and lectures will deal with suit in microbial structure．

## 3212A Algology，lect． 2 hrs．；lab． 3

 0．Chapman．This class is designed to introduce spectrum of topics which may be in the field of algal biology．These w morphological diversity presented structure，marine benthic aspect plankton，marine benthic plankton ecology and eco
Prerequisite：Biology 200.

Texts：E．Y．Dawson，Marine Botar
Reinhardt and Wilson，1966）；Refere G．E．Fogg，Algal Cultures and Phy
Ecology；J．Lewis，Ecology of Rocky

Development，lecture／discussion 3
3 hrs．；G．S．
Hicks，K．
ttempts to provide greater under of the regulation of differentiation and nesis in plants．Emphasis is placed on evaluating a wide variety of experi－ tems，sample topic areas：differential ystems，sampuction，polarity，determina－ potency，photomorphogenesis．
tory sessions emphasize application culture technique to developmental
s：Biology 200 and 205.
sstematics of Higher Plants，lect． 2 3 hrs．；M．J．Harvey
has two main aims；first，to give to current speculation on the the flowering plants，connecting
he attempts over the years to he attempts over the years to
phylogenetic classification of the ccies；second，to go into some of the cepts of classification arising out of puter revolution＇．The latter is still in rimental stage here and will involve y of numerical taxonomy，automated
ion and key construction． e：Biology 200.

Takhtajan，Flowering Plants：their
Dispersal．Reference text：P．H． V．H．Heywood，Principles of Taxonomy．
ptation and Speciation in Higher
deals with the discipline known as The approath tively，experimental onsidering particular examples and deduce which peculiarities of their have contributed to their relative artis way the mechanisms which have Examples considered are many and om evening primroses and irises，
bananas and maize，down to the ut complex，dandelion．
Biology 200.
Briggs and S．M．Walters，Plant

and | mal Evolution；G．L．Stebbins， |
| :--- | ext：0．T．Solbrig，Principles and

2isi，Pleet． 2 Geography－on a physiological Geography－on a physiological
2 hrs．；lab．projects．；M．J．Harvey， Maltzahn．
bution as related to environmental
tresses．Analysis of the strategy of plant life frms as adaptations to stresse．

3321 Invertebrates，lect． 2 hrs．；lab． 3 hrs．， M．Boyd，J．Farley，K．H．Mann，E．L．Mills．
An attempt will be made to understand ho different groups of invertebrate animals live allow them to survive iney incorporated that assume a manner of life alien to their evolution ary predecessors．Because there are so many logical and functional changes will be con sidered in those animals where they are most pronounced or where they first occur．The ourse will progress chronologically through the phylogenetic series；the characteristics of the nimals in a group will be considered and new physiological systems and
peculiarities will be emphasized．

A laboratory session each week will give students an opportunity to examine the morphology and life traits of live invertebrate
animals based on observation of feeding，res－ imals based on observation of feeding，res

3322B Animal Parasitology，（1974－75），lect． hrs．；lab． 3 hrs．；E．W．Angelopoulos．

The class is intended to give students an understanding of parasitism，diversity and
ubiquity．

Although the class gives a survey of parasites from parastic protozoa to vertebrates，the emphasis is not on taxonomy and morphology． Instead，one or more representative species from each group are discussed in detail and
used to demonstrate the life cycle as well as the used to demonstrate the life cycle as well as th physiology are brought into the study of specific adaptations to the environment during free－living and parastic stages．Problems of the reproduction and transmission of parasites are stressed．Different hypotheses of the origin of
parasitism and recent trends in evolution considered

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\text { Prerequisite: Biology } 200 .
$$

3323 Vertebrates，lect． 2 hrs．；lab． 3 hrs．；E．T Garsid

The main purpose of this class is to acquain the student with the current state of knowledge and speculation concerning the evolution of vertebrate animals from an invertebrate ances－
tral line at least 500 million years tral line at least 500 million years ago．
The structure of vertebrates and their sequen－ tial deposition of fossils in progressively more recent formation of the superficial crust of the earth form an unparalleled and unequivocal
exposition of organic evolution，the gradual， exposition of organic evolution，the gradua，
natural development，through the long expanse natural development，through the long expanse
of time，of progressively more complex or－ ganisms．Those vertebrates which have survived the stresses imposed by the restless environ ment form a series of stages or step＇s，each
characterized by several pronounced alterations in various organ－systems and in the general 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． vertebrates．

The laboratory study of a broad array 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 particu－ larly 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 mastered by any diligent student who mast

An appreciation of the classification，structure and evolution of vertebrates is essential onsiderations of the development and fun elations with their surroundings and with each ther．While man is not given any specia position in this strictly zoological treatment the opportunity exists nevertheless for the student to evaluate his personal philosophy he light of our knowledge of vertebra valution．In this respect the class should be of
value those entering the social science theology，teaching and the health professions Various agencies of government employ per onnel to conduct research in areas of fish and wildite research and management；the conten f this class forms an important segment of the ecessary training for these pursuits．
erequisite：Biology 200.
Pielou Entomology，the study of insects，is not only
an important branch of academic biology；it is Entomology，the study of insects，is not only of the largest divisions of biology．There are considerable career prospect

This class is an introduction to the study of nsects and it deals with：
1）The classification and evolutionary diver sity of insects．
2）The biology，ecology and behaviour o insects．
3）Applied aspects－medical，agricultural and orest entomology；harmful and beneficia insects；the pros and cons of chemical contro
ther methods of pest control rerequisite：Biology 200

400 History of Science，lect． 2 hrs．；tutorial hr．；J．Farley．
This class is designed to accommodate students the sciences and the arts．There are no eir he in



2324 Entomology，lect． 2 hrs．；lab． 3 hrs．；D．． biology 200
formal prerequisites although all students mu

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have a strong background in either a science,
history or philosophy. The class will stress the 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 have changed. There will be constant emphasis on the social context of science and the
interactions between the different sciences. interactions between the different sciences.
This class is cross-listed in the History Department classes as History 310

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

4010 Advanced Molecular Biology, (1973-74) lect. and tutorials 2 hrs.; R. G. Brown, W. C. Kimmins, L. C. Vining.
The main objective of the class will be to explain the biochemical basis of structure and
function in biological discussion groups will deal in depth with a limited number of topics, chosen for their regional interest or because they represen rapidly advancing areas of general importance in biology. A proportion of the course materia will be presented by guest lecturers from other departments or from outside the university.
Examples of the topics selected are; cell walls, cell membranes and transport, enzyme catal ysis, antibiotics, photosynthesis, seaweed pro ducts.
Prerequisite: Biology 330A or 330B or Bio chemistry 302

4032B Cytogenetics, (1973-74), lect. 2 hrs. lab. 3 hrs.; O. P. Kamra.
Detailed consideration of certain genetical and cytological mechanisms in relation to chro evolution.
Prerequisites: Biology 202A or B and 203A or B.

4033A Microbial Genetics, C. Stutard.
A half-class for advanced students in microbia genetics.
equisites: Biology 203A or B, 311A.
4034B Biological Effects of Radiation (1974-75), lect. 2 hrs.; lab. 3 hrs.; O. P. Kamra

The class consists of a survey of the current knowledge of the effects of ionizing radiation on biological materials on the three levels: physical, chemical and biological. In addition, methods of dosimetry, autoradiography,
somatic and genetic effects, radiomimetic somatic and genetic effects, radiomimetic

4050 Seminar in Development, seminar 2 hrs lab. projects; L. E. Haley, B. K. Hall, G. S. Hicks, K. E. von Maltzahn.
Advanced reading and project study in develop ment, morphogenesis, differentiation, regenera tion, growth and genetics.
Prerequisites: Biology 205 A or B , and 350 A or B. S. Cooke, J. G. Ogden, III.

Lecture, discussion, and laboratory experience in the reconstruction of environmental chang field experience will pay particular attention to the environmental history of the Maritim region, including environmental changes caused by man. Techniques of pollen analysis, plan and animal macrofossil study, dendrochronology, geochemical and isotopic dating method
will be explored. Field and laboratory work include a class problem in an area in the Halifax include
region.
Prerequ
Prerequisites: At least two credits in Biology o Geology. This course is to be taken in oonjunction with Geology 457 Pleistocen counted as Piology or Geology half-credit.

066B Microbial Ecology, lect. 2 hrs.; lab. hrs.; R. P. McBride.

A format of directed reading, essays and discussions will be used to introduce the he functions: micro-organism populations, munities; interactions between microbes com macro-organisms; and the use of micro rganisms to examine ecological theory. laboratory project will be chosen to suit the of the instructor is required.
4067B Introduction to Biological Ocean graphy, lect. 2 hrs.; E. L. Mills.

A survey of marine populations and their alationships with their physical environmen
nd with each other. Permission of the structor is required.

4068 Advanced Biological Oceanography, lec
Physiology and ecology of marine organism hysiology and ecology of marine organism ture and population dynamics; seasonal and regional variations in populations, interrelations with the physical and chemical environment. Prerequisite: Biology 360. Permission of th

4113 Bacteriology, (1974-75); R. Brown, L. C. Vining, R. P. McBride, D. Mahoney, R. Martin.

A class for advanced students in bacteriology Two of three topics will be chosen and covered in depth.
Prerequisites: Biology 311A or 311B or Micro
biology 302 iology 302 and permission of the instructor is

114 Virology, (1973-74); K. Easterbrook, K Rozee, S. Lee, P. Dobos

A class for advanced students in viro types of viruses will be considered insect, plant and bacterial. Structure ion, natural history and classi
included in the class coverage. Prerequisite: Permission of the required.
4115 Immunology, (1974-75); L. Kind
A class for advanced students in
This class is limited to 12 students.
Prerequisite: Permission of the inst
required. equired
4116A Mycology, (1973-74); R. Brow
A half-class in mycology
Prerequisites: Biology 311A or 311B biology 302

4214 Physiology of Marine Plants, lab. 3 hrs.; J. S. Craigie.

A comparative study of the physio
biochemistry of the various algal classe biochemistry of the various algal class conducted. This will include studies Prerequisites: Biology 201A or B 301

4379B Ichthyology, lect. 3 hrs.; E. T
Evolution, systematics and structure ology, life history and distribution of fi Prerequisite: Biology 323

4400 Ethology, lect. 2 hrs.; lab. or fiel hrs.; J. F. Mortenson.
The behaviour of animals is studied in th and in the laboratory. These observation
other presented material will be discuse other presented material will be discuss.
context of modern ethological theory.

4401 Pharmacology: Influence of Agents on Living Organisms, lect.: M
Fri. 1:30; lab: Wed. 2:30-5:00 p.m. Fri. 1:30;
Echobichon.

This introductory class is designed to
students with the actions of drugs iological and biochemical functions and lower animals. The basic mechan
action and structure-activity relation action and structure-activity relation be stressed and, wherever possible, dise the molecular and macromolecular leve organization. Factors influencing the tion, distribution, biotransformation,
cretion of drugs will be discussed, cretion of dr
potential uses.

The lecture course will be augment practical laboratory course designed fo participation in the demonstration

4402 Functions and Structures of the System, M. Yoon.

## hman Physiology, lect. 3 hrs.; lab. 3-A. Mishra Issekutz.

 tealing with the physio-chemical basis R. Prime
## dealing with the physio-chem.

 R. Prime
## quisite: Introductory classes in Chemistry <br> By Biology, (1974-75), semina History of Biology, J. Farley E. Von Maltzahn, J. <br> will deal exclusively with the "Bio Revolution" of the 19th Century. <br> pecial Topics. <br> Honours Research and Thesis. <br> h.D. Thesis. <br> Chenistry <br> yan (C <br> E. Ryan (Ch J. Chute E. Hayes Knop <br> ciate Professors <br> 1. Dauphinee <br> P. Forrest <br> II. Frei E. Jones Ramaley <br> ant Professors <br> Abrams <br> Faught <br> Gredan Grossert <br> L. Hooper <br> . <br> Special Lecturers <br> . Armour <br> arch Associate <br> monstr <br> L. Heit Renault Renstate <br> M.L. Heit P. Renault R. Young <br> Postdoctoral Fellows <br> S. Carlow <br> 1. E. Curtis I. Janmohame I.H. Ki.

Chemistry is one of the physical sciences and the language of physical science is mathematics. Any student who does not enjoy mathematics
should not contemplate embarking on an
honours programme in chemistry. We say honours programme in chemistry. We say B.Sc. is the minimum professional requirement for a chemist - the general B.Sc. with a major in chemistry has no professional standing. Most will undertake further studies in the subject working towards the degrees of M.Sc. and Ph.D. A postgraduate degree is essential for those who or in university teaching.

The first class in chemistry is an introduction to the discipline. Non-science students who elect to take chemistry to fulfill requirements
degree will find that the subject provides a good insight into the scientific method, though once again it should be stressed that because chemistry is a physical science, the laboratory and class work stresses mathematics more than does students who sience such as biology. Many fessional 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 pre-dentistry, dental hygiene, nursing and pharmacy. Engineering students contemplating chemical engineering should consult the Depart ment of Engineering for advice on desirable classes in chemistry. All students intending 10 lake classes in chemistry beyond the first year physics in their first year and final grades in these classes should not be less than $65 \%$. If they are, the student is bound to find advance
classes

At the second year level At the second year level the student is exposed
in the laboratory to the four areas of specializa tion 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 containing carbon. Analytical chemistry is concerned with the determination of the composition of substances, and with the detec tion of elements in quantities however minute Physical chemistry is primarily devoted to the study of the nature of chemical reactions and is area of chemistry. Beyond the second year level, a student's studies in chemistry become increasingly concentrated in one of these fou areas. The student may also be introduced to biochemistry, or the chemistry of living organisms, as well as such specialties as structura istry, electrochemistry and theoretical chemistry.

Because advances in chemistry have been and continue to be published in many languages, 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. The student is referred to
the regulations of the Faculty of Graduate Studies regarding language requirements for advanced degrees.

Degree Programmes

## General B.Sc. in Chemistry

A candidate for this degree must satisfy all of the general requirements. He will take Chem-
istry 110 in the first year. In the subsequent two years he may undertake as many as five full classes chosen from Chemistry $210,230,240$, $300(\mathrm{~A}), 310,320,330(\mathrm{C}), 331(\mathrm{~B})$ and 340 (two of $300(\mathrm{~A}), 330(\mathrm{C})$ and $331(\mathrm{~B})$ constitute a full class). It is essential that Mathematics 100 be secured as a prerequisite to Chemistry 230 .
Mathematics 200 is a prerequisite to Chemistry $300(\mathrm{~A}), 330(\mathrm{C})$ and $331(\mathrm{~B})$. Physics 110 should be included in the course.
B.Sc. with Honours in Chemistry

This programme is intended to provide a good training in chemistry while at the same time it makes provision for the individual interests of students. All 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
3. A foreign language at 100 leve
4. One of Biology 1000, Geology 100 Physics 11
5. Elective

Years II, III and IV must include:
(a) Chemistry 210,230 and 240
(b) Six full classes from Chemistry 300 and 400 levels. Chemistry $300(\mathrm{~A}), 310,320$
$330(\mathrm{C}), 331(\mathrm{~B})$ and 340 are required classes, $330(\mathrm{C}), 331(\mathrm{~B})$ and 340 are required classes.
(c) Mathematics 200 (a prerequisite for Chem istry $300(\mathrm{~A}), 330(\mathrm{C})$ and 331 (B).
(d) Five other classes. These must be chosen as follows:
(i) If Physics 110 or a foreign language wer ot taken in Year $I$, they must be taken in Years II-IV. (iii) Two classes beyond the 100allowed for this degree are biochemistry, biology, geology, mathematics or physics.
It is suggested that these five other classes be chosen according to the future plans of the student. For example: those planning future study in physical chemistry should take addi-
tional mathematics and physics classes; those tional mathematics and physics classes; those planining future study in organic chems lanning future study in geochemistry should
take one or more geology classes.

In all cases it is in the interests of the student to
consult with the Chairman and other profess in the department. This may be done at any time during the first year. Experience indicates that March is the most suitable time for discussion of a future programme.

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 in their first year. It will not serve as a prerequisite
to second-year chemistry classes Orgnic istry is discussed in the second half of the year, since the regular programme of the students since the regular programme of the students
does not include further study of chemistry. The subjects discussed in the first term include atomic structure, solution equilibria and simple inorganic chemistry. Laboratory experiments
are integrated with the material discussed in are integrated with the material discussed in
lectures. Quantitative aspects of chemistry are not emphasized in this class.

110 General Chemistry, lect.: 3 hrs.; lab.;
tutorial: 3 hrs.; W. J. Chute, G. A. Dauphinee, tutorial: 3 hrs.; W. J. Chute, G. A. Dauphinee,
J. B. Faught, J. E. Greedan, D. L. Hooper, J. C. J. B. Faught, J. E. Greedan, D. L. Hooper, J. C.
T. Kwak, P. D. Pacey.

This is an introductory class in college chemistry with lectures and tutorials on a number of
topics in physical and structural chemistry. topics in physical and structural chemistry.
Included are stoichiometry, acid-base and Included are stoichiometry, acid-base and
oxidation-reduction reactions, gases, liquids and solids, solutions, thermochemistry, equilibrium, structure.

Emphasis is placed on the formulation of theories which will be useful in the correlation of experimental facts, rather than on the
memorization of the facts themselves. Wherever memorization of the facts themselves. Wherever
possible, such a theory is derived using standard mathematical methods from basic physical principles. In tests and examinations the student is expected to demonstrate his knowledge
of the basis of these of the basis of these theories and of their 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 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 Texts: (1972-73) Dickerson, Gray and Knight Chemical Principles; (Benjamin, 1970); This

210 Analytical and Inorganic Chemistry, lect.
-
The first term will be concerned with Chemical Equilibria. An intensive discussion of chemical
equilibria (solubility, acid-base, redox, metal complex) with and without the use of ap-
proximation wil be given. Correlation istry, such as competing equilibria, titration of weak and polyprotic acids, is attempted. The laboratory work will involve modern physical
separation methods on chromatography and on exchange, thin-layer cipitation, titration)].
The second term will concentrate on Inorganic Chemistry and will include a discussion o
electronic structure of atoms and molecula orbital theory. These principles will then be applied to the chemistry and structure of the compounds of the first and second row representative elements and the first transition
series. Organometallic chemistry will also be series. Organometallic chemistry will also be
discussed. The preparation and analysis of inorganic compounds will be the laboratory assignments.
Prerequisites:
Prerequisites: Chemistry 110 or equivalent
Mathematics 100 . Mathematics 100 .
Texts: (1972-73) Bard, Chemical Equilibrium,
(Harper and Row 1966) Macky (Harper and Row, 1966) MacKay and MacKay,
Introduction to Modern Inorganic Chemitry (Intertext, London, 1968).
These texts will not necessarily be used in
1973-74.
230 Introductory Physical Chemistry, lect.: 2 hrs.; lab.: 3 hrs.; W. E. Jones, C. H. Warren.

This class is designed to give a theoretical and practical background in the fundamentals of physical chemistry. The lecture periods include discussions of the following topics: properties of real gases, liquids and solutions; atomic
structure; molecular structure; thermodyna strucs; thermochemistry; electrochemistry; chemical kinetics.
With the exception of topic (a), where background knowledge in the properties of the ideal
gas is assumed, the discussions begin gas is assumed, the discussions begin at an
introductory level. A knowledge of simple calculus will be assumed.
The laboratory sessions will give students an opportunity to perform experiments which illustrate many aspects of the above topics with
modern techniques and apparatus, modern techniques and apparatus.
Prerequisites: Chemistry $110 ;$ Math
Text: (1972-73), Barrow, Physical Chemis 2nd ed., (McGraw-Hill, 1966). This text will not necessarily be used in 1973-74.
240 Introductory Organic Chemistry, Three sections. lect.: 2 hrs.; optional tutorial: 1 hr.;
lab.: 3 hrs.; G. D. Abrams, I. S. Grossert, C A. Armour.
In particular, the student is required to unde stand the relation between carbon and the covalent and ionic bonding; electronic orbitals; orbital hybridization and the determination of molecular geometry by all types of $s$ and $p$ atomic orbital hybridization; electronegativity; equilibria; velocities of realtions; chemical reduction; acids and bases. An examination
may be set on these topics at the begi This class. will prov
This class. will provide a broad intr the chemistry of carbon compounds, eactions and the way in which they ta and the application of spectroscopy to chemistry.
Prerequisit
Prerequisites: A good comprehension
principles studied in Chemistry 110 principles studied in Chemistry 110. Wadsworth Calif. 1971.) This text necessarily be used in 1973-74.

243 Introductory Organic Chemistry w hemistry, lect.: 2 hrs.; lab.: 3 hrs.; W. J. This class is taken by nursing students. not serve as a prerequisite to third-year
in chemistry. During the first term introduction to the chemistry of carbo pounds is given. In the second term ansfer to the Biochemistry Departmen
ect.: 2 hrs.; C. H. Warren.
This class provides an introduction to $q$ mechanics and its application to spectro and the electronic structure of ato molecules. The postulates of q some simple physical systems. This is fo by a discussion of the rotations and vib of molecules, the electronic structure of molecules and the chemical bond and electronic structure of conjugated molecules instructor.
Text: (1972-73), Hanna, Quantum Mec in Chemistry, 2nd ed., (Benjamin). Th will not necessarily be used in 1973-74. 310 Inorganic Chem

The aim of this class is to undert systematic study of the chemistry
elements and their elements and their compounds. The firs
will deal with the typical elements, the will deal with the typical elements, the
term will be devoted to the study transition elements. Appropriate use made of modern bonding concepts suc molecular orbital theory and crystal and field theories, with a view to unifyin
illuminating the dicussion physical propertie discussion of chemic The laboratory will introduce the studen
variety of problems in inorganic synthes characterization. Experiments will be sel to demonstrate the principles and uss vacuum-line and high-temperature techn
work in controlled handling) and nod atmospheres (glo growth, etc. Characterization will physical methods and measurements su optical microscopy, magnetic susceptib magnetic resonance
analysis and others.
site: Chemistry 210.
$\qquad$ Chemistry, 2nd ed. (Interscienc W. L. Jolly, The Synthesis and Charac

ytical Chemistry, lect.: 2 hrs.; lab.: Ramaley.
320 deals with the techniques and used to determine the chemical comof a material. The chemical and are examined in detail in order that of analysis may be rationally selected or modified if needed. Statistical
of data, chemical equilibrium, theory tions, electrochemistry, separation and the interaction of light and matter pics covered in presenting volumetric, nalytical, spectroscopic, and chromatomethods of analysis.
oratory work is primarily concerned
dern separation techniques and the tep in the analysis process, the quantitaetermination. Examples of all methods $d$ in the lecture are performed in the ry. Essential to the class is the ability,
emical and mathematical, to handle emical and mathematical, to handle structure and solution equilibria is
isites: Chemistry 210.
(1972-73), Skoog and West, Principles of on, 1971). This text will not necessarily in 1973-74.
Chemical Thermodynamics, lect.: 2 3 hrs.; K. E. Hayes.
s , while primarily intended for Chemonours and major students should prove est to students in the fields of Biology, nistry and Geology.
lass will proceed via a review of the laws modynamics as applied to ideal closed to consider the problems of real gases potential and the various Maxwell hips. Specific topics to be covered hips. Specific topics to be covered
free energy and equilibria, phase a, fugacity and activity, the properties ons, activities and activity coefficients, ns of electroly tes and the Debye-Hückel
partial molar quantities and E MF, partial molar quantities and E.M.F.'s
thermodynamics of ions.
atory, where students must complete seven experiments through the year, is all times. The laboratory work is
to help the student gain confidence in hat he may obtain in any laboratory that he may obtain in any laboratory.
the experiments will be written up he year as formal reports, following the of the Canadian Journal of Chemistry. sites: Chemistry 230, Mathematics 100,

References: Glasstone, Textbook of Physical Chemistry, (van Nostrand, 1946); Moore,
Physical Chemistry, 3rd ed., (Prentice-Hall, Physical Chemistry, 3rd ed., (Prentice-Hall,
1962); Castellan, Physical Chemistry, (Addison Wesley, 1964); References beyond this minimum list will also be consulted.

This class is a continuation of $300(\mathrm{~A})$. Molecular orbital theory and its applications will be examined in greater detail. Group theory will be introduced and applied
spectroscopy and molecular orbital theory spectroscopy and molecular orbital theory Prerequisite: Chemistry 300(A).

331 (B) Chemical Kinetics, lect.: 2 hrs.; lab.: 3 rs.; every other week; K. E. Hayes, W. E. Jones, P. D. Pacey. iextry, Volume I; Quantum Mechanics and
ist Molecular Electronic Structure, (Allyn and
Bacon Inc., 1970). This text will ne Bacon Inc., 1970). This text will not necessarily be used in 1973-74.
This class deals with the rates and mechanisms of chemical changes. Topics include treatment
of experimental kinetic data, free radical intermediates, inhibition and catalysis, photolysis and luminescence, and special techniques for studying fast reactions. Examples will be drawn from reactions in the gas phase, at the gas-solid interface and in liquid solutions,
Prerequisites: Chemistry 230 and Mathematics 200 or equivalent or consent of instructor.

340 Organic Chemistry, lect.: 2 hrs.; lab.: 3 340 Organic Chen
hrs.; T. P. Forrest:

This is an intermediate class in organic chem istry. The main purpose of the class is to organic chemistry and their application problems of synthesis and structure determin tion.
The laboratory section of the class involves th determination of structures of unknown submethods. Each student has individual problems in the laboratory and is given freedom to use his initiative in solving these.

The first section of the lectures is devoted to an outline of the principles of organic reaction mechanisms and their use in the prediction and nderstanding of organic reactions. The applic chemistry is next considered with the purpos of developing in the student a facility in designing schemes for the synthesis of organic compounds. Examples are used from a variety f fields in er fomiliarize the student wit large number of classes of compounds.
tudents taking the class are expected to have nowledge of the nomenclature of organic
 he functional group classification of organic functional groups, and with the basic concest of kinetics and thermodynamics as applied to hemical reactions. Prerequisites: Chemistry 110 and 240 equivalents.
Texts: (1972-73), R. O. C. Norman, Principles Curtin, The Systematic Identification of $O_{r}$ ganic Compounds, 5th ed., (Wiley, 1964). These texts will not necessarily be used in 1973-74.
400(B) Theoretical Chemistry, lect.: 2 hrs C. H. Warren.

410 Advanced Inorganic Chemistry, lect.: hrs.; lab.: 3 hrs.; 0 . Knop. All chemical elements and compounds can exist as crystalline solids, and most of them normally do. The arrangements of atoms and molecules
in such solids, known as crystal in such solids, known as crystal structures,
closely reflect the bonding properties of the constituent elements. They can only be studied by methods that do not destroy or modify the crystal structure. The aim of this class is to acquaint the student with the methods most requently employed for this purpose and wity
the principles of structural inorganic chemistry in general.
Prerequisites: Chemistry 320, 330(C) and 331 (B) (or equivalents) or consent of instructor. May be registered for only with prior consent of the Department. Texts: (1972-73), Evans, An Introduction to Crystal Ciemistry, 2nd ed.,(Cambridge); Wells,
The Third Dimension in Chemistry, (Oxford). These texts will not necessarily be used in 1973-74. Further references should be consulted.
420 Instruments in Analytical Chemistry, lect 2 hrs.; lab.: 3 hrs.; G. D. Lutwick and R. Stephens

420 is given as two half classes; $420(\mathrm{~A})$ and 420 (B), covering respectively non-elemental and elemental techniques of instrumental ana.

20(A). Instrumental methods applicable molecular species, such as samples of organic material, are discussed. Techniques covered are the elemental analysis of organic samples
spectroscopic methods for functional group analysis (infrared, ultraviolet, nuclear magnetic resonance and mass spectroscopy) and the application of colligative properties in the analysis of high purity samples. The operating principles of each instrument are described,
together with the methods of sample preparation and the applicability to both qualitative and quantitative analysis appropriate to each technique. Solution of practical analytical problems using the combined techniques is an
integral part of the class.

420 (B). Instrumental methods of elemental analysis nalysis are discussed. Techniques covered
include atomic emission and absorption include atomic emission and absorption
spectroscopy using both flame and non-flame cells, arc and spark spectroscopy, x-ray fluore-





methods. Both theoretical and practical experience in these techniques is given. In
addition to normal laboratory operation, students are expected to solve at least one specific analytical problem by instrumental means.
Texts: $(1972-73)$ S S Siggia Survey of Anal Texts: (1972-73) S. Siggia, Survey of Analytical
Chemistry, (McGraw-Hill Ryerson), Willard, Chemistry, (McGraw-Hill Ryyrson), Willard, Analysis, (Van Nostrand Reinhold).

430(A) Statistical Thermodynamics and
Absolute Reaction Rate Theory, lect.: 2 hrs.; Absolute Reaction Rate Theory, lect.: 2 K. E. Hayes

In the first half of this class the methods of statistical thermodynamics will be developed so as to enable calculation of classical ther-
modynamic functions from a molecular basis. The topics to be considered include, derivation and significance of the Boltzmann distribution
law, the relation of thermodynamic functions to the partition function, the evaluation of partition functions for ideal gases, the heat capacity of gases and solids, the equilibrium constant in terms of partition functions and the statistical thermodynamics of adsorption.

The second half of the class considers the failure of collision theory to predict the
absolute rate of chemical reactions, absolute rate of chemical reactions, and pro-
ceeds to use statistical methods to evaluate the Absolute Reaction Rate Theory which will then be applied to systems of particular interes
Prerequisites: Chem.

431(A) Electrolyte Systems, lect.: 2 hrs.; lab 3 hrs.; J. C. T. Kwak, L. Ramaley.
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 electroapplications, colloid chemistry and electro-
kinetic phenomena as applied to e.g. electrophoresis and centrifugation, and a description of membrane transport and coupled transport with examples of biological importance. Laboratory experiments emphasize the measlow and high impedance systems, microlow and high impedance systems, micro-
electrodes, redox-electrodes and selective-ionelectrodes, as well as thermodynamic and transport properties of electrolyte solutions. Prerequisites: Chem. 230 or consent of instructor.

432(B) Atomic and Molecular Spectroscopy, Warren.
The class is designed to introduce the student to the theoretical and practical aspects of
atomic and molecular spectroscopy The atomic and molecular spectroscopy. The major
topics will include discussions of techniques of spectroscopy atomic spectra, diatomic mole-
cules, polyatomic molecules and electron and cules, polyatomic molecules and electron and
nuclear spin. The discussions of all topics will nuclear spin. The discussions
begin at an introductory level.

The laboratory has been designed to give the M. A. Usmiani student a knowledge of various spectroscopic
instruments and the analysis of the resulting spectra.
Prerequisit Prerequisites: Chemistry 110 and Chemistry 30 or permission of instruct
Text: To be announced
440(A) Spectroscopy of Organic Molecules, lect.: 2 hrs.; lab.: 3 hrs.; G. A. Dauphinee, T. P.
Forrest, D. L. Hooper.

This class includes an introduction to the theory of mass spectroscopy and nuclear magnetic resonance spectroscopy, however the techniques as well as infrared and ultraviole spectroscopic methods in the structure deterText: Williams and Fleming
Methods in Organic Chemistry, (McGraw-Hill). This text will not necessarily be used in 1973-74.
440(B) Mechanism, Stereochemistry and Synthesis in Organic Chemistry, lect.: 2 hrs.; lab.: ${ }^{\text {G. hrs., }}$ K.
Gbrams.

In this class, methods for determining the mechanisms of organic reactions are discussed from the viewpoint of the physical organic
chemist, including such approaches as the of free energy relationships, kinetic data, and isotope effects. Stereochemistry is considered in terms of the concepts of symmetry, and procedures for the determination of absolute configuration, including the use of asymmetric synthesis, are presented. Aspects of the strategy
and tactics employed in the multistep preparaand tactics employed in the multistep prepara-
tion of complex organic molecules are exemplified by consideration of representative major syntheses.
The laboratory will illustrate some of the advanced techniques used in modern organi chemistry.
Prerequisite: Chemistry 340 and Chemistry 230 equivalents, or permission of instructors.
All classes, and particularly the advanced classes, are required to consult material beyond and references stated.

## Graduate Studies

The department offers graduate classes leading
to the degrees of M.Sc. and Ph.D. Details relating to admission schere and Ph.D. Details ships, requirements for the degree, classes of instruction, etc., can be found in the Calendar of the Faculty of Graduate Studies.

## Classics

## Professors

A. H. Armstrong
T. E. W. Segelber

Associate Professors
ssistant Professor

## R. Friedrich

Classics is the study of our origins Christian-European tradition to wh the Mediterranean area. The fundamen and beliefs of Europeans and North A by which we are distinguished from
Indians, and those of other tradit formed in the meeting of Greek and cultures in ancient times. To understa our own contemporary culture, we mus its historical origins.
Classics is much more than the study o anguages. Languages are not learned f
selves, but because they are necessary scientific study of ancient history, li eligion, mythology and philosoph Classics Department at Dalhousie instruction both in these subjects and in languages. While previous preparation in
more ancient languages is desirab nore ancient languages is desirable discovers an interest in classics to b language studies during his university co
A student taking classics at Dalhou approach the study of ancient cultures
literature or through history and the social structures or through the study and Christian philosophy. Honours co offered which concentrate on any one hree approaches
The department also offers combined courses in Greek and German and in La rench. These courses take account exceptionally close links between nd between German and Greek poe philosophy on the other

Sudents of classics usually learn Gr atin. Instruction may also be had in Coptic, Syriac and Arabic.
It is obvious that classics is worth studyin its own sake by students who wish to fions and beliefs of our society. This knot as always been regarded as pertinen career in politics and the higher levels civil service. For those who are thinkin cergy, cl
Classical studies also prepare students $\ddagger$ of teaching and scholarship in severa tions. Now that Canada is no longer a culturally; but responsible for its own we have great need of scholars and who know about our origins. Teac find in Canada. Classics is also the preparation for the study of non-E cultures (Chinese, Indian, Islamic, et here is a growing need for specialists
the older history of philosophy, and history of Christian belief until, and
the Reformation, a knowledge of , the Reformation, a knowledge of is indispensabe. general. Classics leads Egyptian, etc.) and to archeology

## Degree Programmes

## . and B.Sc.



## lasses offered by the department, Classics

 and 102 , Classics 354, and thoseHistory and Ancient and Medieval His classes not having a language prereshould be especially useful to students a general degree. All classes beyond the vel are available for major and minor
mmes in classics, and the Department mes in classics, and the Department
glad to assist students in working out nes according to their interests.
rs Programmes may choose between three mes: B.A. with Honours in Classics,
with Honours in Classics (Ancient ith Honours in Classics (Ancient
or B.A. with Honours in Classics Philosophy). In each case, it is highly but not essential, that the student study of at least one of the classical suring the first year of study. In ity with University regulations, the
classes of the Honours programme are classes of the Honours programme are (Note that for purposes of meeting requirements, Ancient History and and Medieval Philosophy classes may nted either as Classics credits, or as
and Philosophy credits, respectively)
th Honours in Classics
ne classes beyond the 100 level in the abject must include advanced work in Greek and Latin, at least two 300 level
in each. The course must include work the 100 level in both ancient history cient Philosophy, one of which may be das the minor subject.
Classes in a minor subject: either History or Ancient Philosophy.
classes not in the major field: Ancient here along with other electives.

## Honours in Classics (Ancient Philo

classes beyond the 100 level in the losject must include, besides the avaiadvanced work in Greek (including two at the 300 level) and some work in Latin to the level of Latin 201). classes in a minor subject: History and Medieval).
classes not in the major field may or other electives.
Honours in Classics (Ancient History) classes beyond the 100 level in the

History, but must include work to the 300 Tevel etc.) in which attention will be paid to he at in at least one of Greek and Latin, and at least religion and social forms of these cultures as elementary work in the other. If the field of well as their political development, in
tudy requires work in other ancient languages,
second term the civilizations of Greece, Rome, such classes may be counted either as Classics and Israel will be studied, and their issue in the redits or as electives. Early Christian world considered.
(ii) Two classes in a minor subject: Philosophy (Ancient and Medieval).
(iii) Four classes not in the major field may nclude additional classes in History or Philo sophy, or other electives,

## Combined Honours

Classics may be taken as part of a combined honours programme with French or German Students interested in either of these pro reammes should consult with the heads of th espective departments.

$$
\begin{gathered}
\text { Classes Offered } \\
\text { Literature, History and Philosophy }
\end{gathered}
$$

Note: The history and philosophy classes listed below may be given credit as classics classes or as history or philosophy classes respectively. knowledge of ancient languages is not pre supposed.
Classics 100 Classical Literature in Translation, ect.: 2 hrs.; R. D. Crouse.

Classics 100 is intended to introduce the student to the poetry and literature of classical and Christian antiquity, by means of a study, in nglish translation, of some of the greate
,
The first part of the class will be devoted to study of Greek Epic and Drama (Homer's Iliad, tragedy and comedy) and Plato's Republic. The literature (Vergil's Aeneroman poetry and Satires). The lectures will conclude with a study of St. Augustine's Confessions.

The course will concentrate on the most important literary forms and themes and political and philosophical ideas expressed in introduction to both the study of ancient and Christian literature and the study of world literature; it should also be of value to students in other fields of the humanities and social sciences in that it shows the origins and
significance of many of the ideas which have seen of central importance in the formation of the traditions of Western thought.

As the class is intended as an introductory one, no special preparation is expected, and there is no foreign language requirement. (See also
under Comparative Literature.)

Classics 101 Ancient History: An Introduction o the Cultural History of the Ancient World, lect.: 2 hrs.; J. P. Atherton.
The first term will be devoted to a stedy of the
The firt

As the class is intended as an introducta no special preparation is expected, and there language requirement.

## 3 hrs., M. A. Usmiani.

 xpressed in the visual civilization as it theme of the ciss ar arts will be the mat ences will be made to ancient literature and some basic reading of Greek and Roman literature in translation will be required, thechief emphasis will be on how the basic classical ideas are reflected in the visual arts, especially sculpture, painting and architecture, and how these parts tended to shape the course of the
daily life of the ancients. The lectures will be illustrated.

In addition to collateral reading, short papers on selected topics will be required. The course will be useful to students interested in ancient those studying ancient art. There is no foreign language requirement.

Classics 222 Greek History, lect.: 2 hrs.; J. P. A therton (not offered in 1973-74)
Classics 223 Roman History: The Cultural History of the Roman World, lecture/seminar, 2 hrs.; J. P. A therton

During the first term the class will study the origins of Roman culture: the formation of the Roman state, the establishment of Republican
institutions, the rise to world empire and the final collapse of the Republic will be considered in the closest relation to the peculiar religious and intellectual tradition of the Roman people.
The balance of the year will be concerned with the study of the establishment of the Roman Empire under the Caesars; the emergence
within this world empire of new religious forces; and the conflict between the classical tradition and the Christian religion in the later ancient world.
In all periods particular attention will be paid to the connection between religious innovation and change in political and social life and the effect of
Prerequisite: A history class or a classics class, disrection of the ine social sciences, or at the

Classics 224/524 Christian Beginnings and the Early History of the Church, seminar, 2 hrs; E. Segelberg.
life of Jesus Christ. He as a philosopher, but interprets himself in term of offices and functions to be properly understood only from his Near Eastern background
he result of a slow development throug he result of a slow development through
his seminar will indicate a few features of that background, will further try to explain certain bacic facts regarding Jesus, and will finally show how his work continues in the Church specially be dealt with, another that of th iturgy or sacramental life, or the beginnings of the papacy, etc.
Classics 226/526 Roman Religion, seminar: 2 rs. E. Segelberg (not offered in 1973-74)

Classics $227 / 527$ Near Eastern Religion, seminar: 2 hrs.; E. Segelberg

Near Eastern Religion, as known mainly from he Sumerian, Akkadian and other Semitic specially Hebrew Linguistic areas from earlie
his seminar can preferably be taken by those interested in the Old Testament and thos participating in the seminar on the early hurch
Classics 252/552 Seminar on Problems of the Hellenistic Period, seminar: 2 hrs.; E. Segelberg (not offered in 1973-74).

Classics 253/553 Seminar on the Roma mpire and the Rise of Christianity, seminar: hrs.; J. P. Atherton (not offered in 1973-74).
lassics 336 Ancient Philosophy from Aristotle St. Augustine, (same as Philosophy 336

Classics 336 (Philosophy 336) studies the evelopment of classical and patristic though from Aristotle to St. Augustine and examine he manner in which the philosophical dechieve ment of ancient Greece came to form, in the foundation of European culture.

Classroom discussion and occasional semina papers will focus on a few of the mos important texts, while the general continuity of supplementary readings.

Classics 338 Medieval Philosophy, (same Philosophy 338), lect.: 2 hrs.; R. D. Crouse.
Classics 338 (Philosophy 338) studies the development of philosophy in the formative age political, institutional, literary and theologica concerns. An attempt is made to show how the legacy of classical and Christian antiquity was propiated and refmed to constitute the deology of medieval Christendom.

The class will be devoted mainly to the study and discussion of a few fundamental texts,
beginning with Boethius' Consolation of Philo. sophy. Special attention will be of Philo Anselm's Proslogion and the first few question of Thomas Aquinas' Summa Theologiae. It will
be the object ontinuity of the lectures to present the mphasize the broal sophical doctrines presentications of the philolatter part of the presented in the texts. In the given to ta medieyal Plame attention will bo so that something can be shown of the beginnings of Reformation and modern philosophical and religious thought.
Classics 354 Theory of Drama: Aristotelian and Non-Aristotelian, (same as Comparative Litera-
ture 354), lect.: 2 hrs.; R. Friedrich. (not offered in 1973-74).

Classics 461 \&561 Seminar on the Philosophy of Aristotle, seminar: 2 hrs.; J. A. Doul
The purpose of this seminar is to determine the original sense of Aristotlean philosophy Some previous study of ancient philosophy and the ability to read Greek or Latin are assumed.
Classics 462/562 Seminar on the Philosophy of Plato, seminar: 2 hrs.; J. A. Doull (not offered in 1973-74)

Classics $466 / 566$ History of the Interpretation of Aristotle, seminar: 2 hrs.; J. A. Doull (no offered in 1973-74)

Classics 467/567 Seminar on the Philsophy the Church Fathers, R. D. Crouse (not offered in 1973-74).

Classics $468 / 568$ Seminar on Neoplatonism, Seminar: 2 hrs.; A. H. Armstrong
Topics from the history of Neoplatonism and its relation to the theology of the Greek Church will be studied.
Classics 485/585 Departmental Seminar: Pro lems of the Fourth Century. seminar, 2 hrs.; A H. Armstron

The object of this seminar is to bring together honours and graduate students and faculty members to study a wide range of problems in the areas of history, politics, literature, philo-
sophy, religion, theology and art, in the period of the emergence of the Christian Empire.

## Classes Offered

Classical Languages and Literature
Greek 100 Introductory Greek, lect.: 4 hrs.;

This is the beginners' class in the Greek language, and no previous knowledge is re uired. The aim of this class is to teach book of Xenophon's Anabasis. T student begins with the simpler Greet New Testament, and then proceeds to complex Classical Greek of the most in authors of the Greek literature that preserved.

At least once a week students will correction grammatical exercises and//
tions from Greek into English. There lab work and no oral classes.
Text: Stephen W. Paine, Beginning Gr
Greek 200 Intermediate Greek, lect Fredrich.
Greek 200 is a continuation of Greek aim of the class is to develop the poetic Greek texts. At the beginne class there will be a brief but sym review of Greek syntax. This will be by the reading of texts of Plato, Herodo Homer.
Other topics, treated by students papers, will be the life and thought of the political and historical background thater the poititical and historical background th
to his trial; the judicial system at $A$ Socrates as dramatic character in Aristo comedy; and the historical significa
-
Through the reading of one book of th students will be introduced to the lan Homeric poems; this will also pr -
Greek 300 A and B Greek Drama hrs.; R. Friedrich, J. A. Doull.

The first term will be devoted to a Aeschylus' Prometheus and other poet ments of the Promethcus myth; term to the study of the Oresteia.

Greek 301 Greek Historians.
Greek 304A and B Greek Poetry
hrs.; R. Friedrich, J. A. Doull.
Greek lyric poetry of the Archaic $A$ the subject of this seminar; the wor poets of this period will be studied ag background of the preceeding period poetry.
In the first term elegiac, iambic and lyric poets will be studied (Archilochu lyric poets will be studied (Archilochı
Tyrtaius, Alcaius, Sappho, Anacreo second term will be devoted to a
Pindar. ${ }_{\text {Prerequise }}$

# 00 Introductory Latin, lect.: 4 hrs.; M 

is for students who wish to begin th 5 is for students who wish to begin the enable the student to read classical the end of the course with the help of onary. In the course a very basic survey
Roman civilization is also given. The throughout is on direct reading with mar fed in as necessary.

20 Latin Rhetorical Works, lecture/ 53 hrs.; M. A. Usmiani.
ss consists mostly of the reading of the Circero, especially his speeches which range of his interest and give a vivid the cultural and social circumstances and the role of Rhetorics in Roman be given.
is required for any more advanced Latin.
Latin. Senior matriculation in

3 A and B. Latin Poetry, lecture
ns 2 hrs.; M. A. Usmiani. (not offere

A and B Latin Philosophical Texts
A. Doull, R. D. Crouse
roose of this class is to give students ed in ancient and medieval philosophy ence in reading philosophical Latin. Middle Ag
site: Latin 100 .
A And B Roman Historians, lect.: 2
A and B
Atherton.
studies Roman historical texts
inscriptions, and other documents) the 1973-74 session, selections of
and Tacitus will be studied. This is and Tacitus will be studied. This is language and content of the writings
two great historians.
ite: Latin 100 .
0 A and B . The Roman Satire, lecture
Usmiani.
can be taken in two sections as two
Horace and the second half (B) of the
of Juvenal, but the class is normally
ne full course as described here.
anced class is designed primarily for
students and undergraduate honours
ty special arrangement the class can
taken by students from other depart
ven if they possess little or no know Latin. They would be permitted to

The class follows the development of Latin satire from its origins to Juvenal. The chief representatives of Latin satire that survived are their works is read and studied thoroughly. Students are required to read the assignments for themselves and to follow the lectures which are informal and are combined with discussions of problems that arise from the texts. There are also occasional seminars on special topics and
problems in the Roman satire problems in the Roman satire

Additional reading is suggested as an aid and is eft to the discretion of the individual student. Prerequisite: Latin 200 .
Latin 302A and B. Roman Comedy, lect.: hrs, M. A. Usmiani.

This class is normally given as one full course but it can be taken in two parts, the first (A)
consisting of the Study of Plautus and the second (B) of the study of Terence.
This class consists of readings of selected plays of Plautus and Terence. As an introduction to
readings, a brief survey of Greek given, and in a few lectures the general lines of Roman comedy are sketched. The class work is conducted in seminar style, students reporting on their readings and impressions of the dividual plays.
not read Latin.
Prerequisite: Latin 20

## Classes Offered

## Near Eastern Languages

The classes in Hebrew, Coptic, Syriac, Arabic, and Akkadian are available as electives at the discreetion of the Department, only in relation

Hebrew
101 Elementary Hebrew and Introductory Readings, J. B. Hardie

This class is taught at the Atlantic School of Theology.

202 Intermediate Hebrew, J. B. Hardie
This class is taught at the Atlantic School of Theology

303 Advanced Hebrew, J. B. Hardie
This class is taught at the Atlantic School of Theology
Copic
01 Introduction to the Coptic (Sahidic) Language and Literature, E. Segelberg. (not
$000 \quad \begin{aligned} & \text { H. A.M } \\ & \text { A.Shaw }\end{aligned}$
00 of Selections from other Coptic
Dialects, E. Segelberg

402/502 Reading of Coptic Texts, E. Segelberg.
Partly Nag Hammadi Papyri, and partly Mani Partly Nag Ha .
chaean texts.

## ${ }_{100}$ Syiac

100 Introduction to the Syric Language and berg. berg.

Reading of some early writers such as Aphra ates and Aphrem, the famous hymnographer.

## Arabic

Students wishing to take a class in Arabic must consult with the Department before registering for the class.

100 Introductory Grammar and Reading Texts.
This class is taught at the Atlantic School of Theology.

## 200 Intermediate Arabic,

This class is taught at the Atlantic School Theology

Graduate Studies
The department offers an M.A. programme in classical literature, in ancient history and in ancient and medieval philosophy. For details, Studies.

## Commerce

## Professors

C. R. Brookbank
R. S. Cumming
R. E. George
R. E. George
C. W. Schandl

Associate Professors
J. D. Misick (Chairman)
R. H. R. Glube
J. R. Hanrahan
J. W. Matthews
E. W.Scott
J. Scheibelhut
R. C. Shook

Assistant Professors
Assistant Profes
C. R. Dipchand
C. R. Dipchand
C. J. McManus
L. W. Mealiea
I. Muncaster
R. S. Sandhu

Part-time Special Lecturers
A. Shaw
P. Mason

The Department of Commerce offers a curdesigned to equip students to serve the com munity in business, government and the pro fessions. Graduates in good standing from all
faculties can apply to enter the graduate faculties can apply to enter the graduate
programme, leading to the degree of Master of Business Administration. The undergraduate programme includes studies in the humanities and social sciences and in the functional areas of business. Recognition is given to the growing mphasis on quantitative and behavioural analysis.
n all courses the main effort is directed towards drawing out the principles which govern traditional and contemporary practice he principles are related to current develop large, and special discussion meetings are ranged in which recognized authorities participate.

The students may follow a general programme of study or choose a measure of concentratio in one of five special areas. These are A Organizational Behaviour.

All students entering the Commerce programme will be required to satisfy the department as to heir competency in the English language.

## General Outline of <br> Undergraduate Studies

## I. Honours Programme

Four years of study are required comprising the quivalent of twenty full classes; ten require lasses, four elective classes taken from the core eas, three elective classes from outside the ore areas, and three classes chosen withou ust be an honours seminar the required classes Commerce, Economics and Mahe
he honours programme enables the student to udy a particular area of commerce in greate epth than is possible in the general pro gramme. Certain practical advantages arise from the possession of an honours degree. Thes include the possibility of a larger number of ccounting bodies in Canada, credit for part or all of the first year classes in the Master of business Administration programmes at some Canadian universities, admission to graduat schools which require an honours degree as a formal educational background for those who will not attend graduate school.

In accordance with general faculty regulations tudents in the honours programme are re to the department in each year of study. If this tandard is not maintained, the student may b required to transfer to a general degree pro gramme. The honours programme will, there
requirements of the general degree. Students in the general degree programme may
transfer into the honours programme.
II. General Programm

Three years of study are required comprising
the equivalent of fifteen full the equivalent of fifteen full classes; eleven
from core areas (nine required with electives), two from outside the core areas and two selected without restriction.

## Programme Particular

A. Degree Requirements (No special area concentration)

## Year I

## Three required core area classes:

Commerce 101
Economics 100A and 100B
wo classes selected areas.

Year II
The equivalent of five core area required classes:

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& \text { Commerce } 204 \\
& \text { Comperce } 206
\end{aligned}
$$

Commerce $206 \mathrm{~A} / \mathrm{B}$ (students with an in227 , Math 230, or Computer Science 240 instead of this half class)
Commerce 207A/B
Commerce 2008A/B
Commerce 209A/B
Commerce 215A
Commerce 216B
Economics 220A/B or 221A/B
Year III
ne required core area class:
Commerce 311
Two full classes or their equivalent selected from within the core areas.
Two full classes selected without restriction rom those offered within the Faculty of Arts
or honours students the programme for year III as well as for year IV must be determined in consultation with the department and must be approved by the department.

## Year IV (honours)

One required Honours seminar.
Two classes selected from within the core areas.
One class chosen from outside the core areas.
One class selected without restriction from those offered within the Faculty of Arts and Science.

No 100 level classes may be taken in the fourth year.
Note: When selecting their electives, students

## B. Specia grammes

Subject to general faculty regulation general outline given above, a stu devise his own programme of study in
tion with faculty in the department tion with faculty in the department
general guidance of students, the has prepared suggested programmes who wish to concentrate in a specific

1. Accounting

Year I As for those without a sp concentration

Year II
Required core area classe
Commerce 204
Commerce 206A/B
Commerce 207A/B
Commerce 215A
Commerce 215A
Economics 220A/B or 221A/B
Elective
Commerce 310
Year III
Required core area classes
Commerce 209A/B Commerce 311

Three full class equivalent electives chose Commerce 214B
Commerce 301
Commerce 320A Commerce 452

Year IV
Commerce 450 seminar
The equivalent of three classes from more of the following areas. Finance Economics
Mathematics
The equivalent of one elective from outs core areas.

The professional accounting bodie certain exemptions in respect of classes
the Department. These differ from pro province

## Particulars can be obtained from the

 offices of:The Institute of Chartered Accountant The Associatio
Accountants
Accountants Certified and
The Chat Industrial Accountants
${ }_{\text {Ear }}^{\text {Eanomics }}$ as for those without a special area
and Year III as for those without special ncentration except that certain electives isite requirements of the 300 level and liste economics classes will be met, it will ssary for students to postpone one or the 200 level Commerce core classes to ird year. The Department of Commerce be consulted in regard to the classes to
tration in Applied Micro-Economics
nomics $220 \mathrm{~A} / \mathrm{B}$ or $221 \mathrm{~A} / \mathrm{B}^{*}$
Conomics 320B
conomics 325
litional class in Economics
ntration in
national Trade Management and
nomics $220 \mathrm{~A} / \mathrm{B}$ or $221 \mathrm{~A} / \mathrm{B}^{*}$
onomics 324
onomics 326B
onomics 423A
ditional class in Economics
tration in Development
nomics $220 \mathrm{~A} / \mathrm{B}$ or $221 \mathrm{~A} / \mathrm{B}^{*}$
nomics 329
onomics 334B
nomics 432
was not taken to satisfy core
conomics seminar
divalent of four full electives chosen in
tion with the Department.
As for those without a special area
Artion
As for those without a special are

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& \text { As fc } \\
& \text { tration }
\end{aligned}
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Year III
Required
quired core area class
mmerce 311
mended electives
Commerce 301 or 3
Commerce 331A
Commerce 332B

Ommerce 214D
merce 320A
Year IV

The equivalent of three classes from one or Year II Finane following areas.

Required core area class
Accounting
Economics (Money and Banking, Price Core area electives
Commerce 322A
Commerce 324B
one-half class core area elective electives chosen without restriction

Year I
Commerce 470 seminar
enter of four full electives chosen in

## Classes Offered

101 Introductory Accounting, lect.: 3 hrs orkshop; l hr.; G. E. R. Zinck J R. Renumbered Commerce 210 for 1970-71 only.

This class gives an introduction to the principles used by accountants in processing financial data and in communicating such data both within
and outside the business, and studies the interpretation and use of financial reports for decision-making purposes.

The first half of the term will emphasize principles and their application in what is second half of the term the focus will be accounting information for management needs.

There are no prerequisites for this class. The number of students who can be accommodated in this class will be limited. Any student who his second year.

102 Renumbered Commerce 311 below
204 Statistics for Economics and Busines, lect.: 3 hrs.; workshop: 2 hrs.; R. E. George (same as Economics 222).

Topics studied include the definition, function and sources of statistics; the design and execution of statistical enquiries; statistical tables; graphs and diagrams; measures of central
tendency, dispersion, skewness and kurtosis; curve-fitting; 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 quanti-
tatively, which is usually gained by the study of tatively, which is usually gained by the study of geometry and algebra at the high school and
university level; familiarity with national accounting concepts.

Note: Each of the following $\mathrm{A} / \mathrm{B}$ classes may be offered only as A or B

206A/B Computer Applications to Business Problems, lect.: 3 hrs.; P. E. Mason.

Computers are playing an increasing role both in business and in modern society. In order to familiarize the student with the concept of a
computer, its advantages and disadvantages and current applications, this class takes a threefold approach:

1. The computer will be introduced as a tool for solving numeric problems commonly encountered while in university. FORTRAN
will be taught in depth and sample problems will be taught in depth and sample problems
from such fields as statistics, finance, and market research will be assigned.
2. Large computer systems will be introduced from the point of view of a manager rather than actually used for such applications as cost analysis, inventory control and accounts re ceivable will be implemented, data bases created and simulated production runs made.
3. COBOL, the most commonly used business oriented language used today, will be inwith introductory problems will be conducted. Prerequisites: There are no prerequisites to this class except the ability to think coherently. It is recommended that this class be taken as early
as possible because the use of computer as possible because the use of computer
facilities will ease the workload in other classes.
$207 \mathrm{~A} / \mathrm{B}$ Introduction to Managerial Finance, lect.: 3 hrs.; C. Dipchand, J. R. Hanrahan.
This class gives an introduction to the problems faced by business managers in the acquisition
and effective utilization of the firm's financial resources and presents analytical concepts for evaluating financial decisions. This necessarily involves consideration of how the firm can achieve successful interaction with its external tion to the operation of the economy contribu-

Essential background knowledge: An understanding of economic principles and the economic environment in which a business operates, and sufficient knowledge of accounting
processes and principles to enable the student to use financial data intelligently
Prerequisites: Economics 100A and Economics 100B and Commerce 101.
208A/B Marketing Management, lect.: 3 hrs.; R. H. R. Glube, I. Muncaster.

This class is designed to give the student a basic understanding of the character and scope of marketing and its role in business operations. It focuses upon the concepts and techniques which a business must employ if
anticipate and satisfy consumer needs.

Emphasis is placed on the development of understanding and analytical ability in the following areas: the role of the consumer;
product-line development; channels of distribu-
ion; pricing systems; selling and promotiona activities. Case materials are used to give the
tudent insight into the analytical tools used in problem analysis and decision-making
No previous training in marketing is assumed. Students wishing to concentrate in marketing should plan to take Commerce 208A/B in their

There are no prerequisites for this class, although some knowledge of accounting woul
be helpful. be helpful.

209A/B Production, lect.: 3 hrs.; C. McManus.
This half-class is designed to give the student an insight into the applications of management process in production.

The topics which will be covered include: the background of management science, principles of model building, the use of models for ssource allocation, control of inventorie mulation, scheduling and contro
rerequisites: Commerce 101, Economics 100 latter will normally be taken concurrently
213A/B Legal Aspects of Business - Contracts, lect.: 3 hrs.; R. S. Sandhu.
The meaning and sources of law, the machinery of justice; torts, formation of contracts
capacity of contract; legality of object, mistake, misrepresentation; statute of frauds.
Privity of contracts; interpretation and dis charge of contracts; breach of contracts; agency.
S. Sandhu.

Contract of sale, bailment, employment; negoti able instruments, real property, tenant and landlord, mortgages; partnerships, corporations,
their nature and management; devices for securing credit; bankruptcy, mechanics lien imitation of actions
requisite: Commerce 213A/B.
215A Organization Theory, lect.: 3 hrs.
The purpose of this class will be to survey both theory and research pertaining to complex organizations with emphasis on design,
structure and administrative practices in connection with the environmental setting and how the interaction of these variables relates to organizational performance. Concomitant with will haposure to theory and research students will have the opportunity to apply this know-
ledge to case studies relevant to comple organizations. While the main emphasis is put upon the analysis of this material, time will also be devoted to the formulation of general solutions and decisions for action.
216B Organization Behavior, lect.: 3 hrs.

The purpose of this class is the develo and capacity for objective analysis Research and text material drawn fields of sociology, anthropology
chology are used as aids in chology are used as aids in the deve
understanding and objectivity understanding and objectivity.
dealing with substantive data behavioral sciences, the class pays attention to case material.
Commerce students are required to and 216 B as a complete unit with 2
prior to 216 B . Non Commerec take either class as a half class.

218B Marketing Management, lect.: Muncaster.
This class develops on the theory Commerce 208A/B with the goal of aking effective action in the marke ions which face the practising manager. Instruction will be based on thus will be limited to 40 stud role $p$ Prerequisite: Commerce 208A/B.

Note: It may not be possible to offer classes listed below in every year. hould bear this in mina when pla rogramme for the following yea 301 Cost Administration,
hop: 1 hr.; J. Matthews.

Cost accounting is studied as an management control and decision-mak management and the means of accur and reporting the necessary informatio determination, planning, control and bu (cash and capital) are analyzed in rel he internal needs of the management

Essential background knowledge: tanding of accounting processes and standing of accounting processes and information.
Prerequisites: Commerce 101 and $C$ 10. The latter may, with the app

02 Renumbered Commerce 215A merce 216B above.
305B Small Business Managent R. Glube.

This class uses written and oral cases and apply business principles to specific mall-business situations. Students are o review and supplement their kno basic business functions, to find and pertinent materials in libraries and fro
sources, and to organize and integrate sources, and to organize and integrato
materials and business principles into recommendations for managing a ${ }^{\text {small businesses. }}$ Prerequisites: 101,

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Organization of sales departments; sales planning and forecasting; quotas; territories; perfor mance standards; analysis and control of dis ibution costs.
Terequisite: Commerce 208A/B.

## 315B Marketing - Promotion

This class will develop on a base of consume psychology and then treat advertising, sales anagement, promotional mix. Problems are viewed through he eyes of the marketing manager in both business and institutional organizations and major emphasis is placed on understanding the factors, both business and social, that affect Prerequisite: Commerce 208A/B.

## 18B Marketing Research, lect.: 3 hr

The class will use the scientific method in olving marketing problems. Emphasis will be on planning and formulating the research ing methods, statistical design of experiment, and analysis of data collected. A real-life esearch project will be required, its nature to determined considering student interest an background.
trerequisites: Commerce 204 con - B , Commercently.

319B Product Management, lect.: 3 hrs., 1. Muncaster
The class will expose the student to the many faceted problems of managing the product function in a variety of situations. The class will be based on use of projects involving actual companies and on the use of cases.

320A Taxation, lect.: 3 hrs.; H. A. MacKinley
An introduction to the taxation system in Canada, with special reference to the provision of the Income Tax Act and their effect on business decisio

Essential background knowledge and technical skill: knowledge of economic principles and the conomic environment in which a busines ing information.
rerequisites: Commerce 101 and Economic
100 A and 100 B .
22A Interpersonal Dynamics, lect.: 2 hrs, L. Mealiea.

A more intensive study of selected topic area which emphasize the processes and possible tion between individuals. The intention of this half class is to build upon the knowledge gained in Commerce 216B and will employ such learning techniques as sensitivity training ructured exercis. nd case studies.
rerequisite: Commerce 216B or permission instructor.
323B The Personnel Function, lect.: 2 hrs.
This class provides a knowledge of the various ersonnel processes required in organization which employ a substantial number of people tuch organizations must deploy personnel
the basis of skills (task specialization) and be concerned with staffing appraisal, training and ing, handling grievances, health and safety, eadership and justice with respect to employees. All of these processes comprise the personnel function.
Knowledge of the processes is supplemented by the development of analytical skill in coping
with various personnel problems and in the integration of the processes with the many other functions required in the organization This type of "system and process" analysis is built upon the skill and knowledge acquired in the class on Organizational Behaviour. Cases environments.

Finally, the role of personnel management and the administration of the personnel function will be subject to consideration and analysis. Prerequisites: Commerce 215A and Commer

24A/B Labor Relations, lect.: 2 hrs.
This class will expose the student to the history of organized labor in Canada: union, manage Canadian worker; and the process of collective bargaining.
Prerequisites: Commerce 215A and 216B, permission of professor.
331A Security Analysis, lect.: 2 hrs.; Dipchand.

The objective of this class is to introduce students to the theory and philosophies of investment. This class concentrates on investment analysis suitable for the individual, the estate or small group. The main focus is on ment trusts. Case material is primarily Canadian and covers such areas as growth stocks, new issues, convertibles, closed end funds, mutual unds, and warrants. Reading assignments and ase-analysis will provide the student wh portforio managememt on a problem basis, Prerequisites: Commerce $207 \mathrm{~A} / \mathrm{B}$, Commerc 204, and Economics 221A/B
332B Money and Financial Markets, lect. hrs.; C. Dipchand.

Students are introduced to Canada's capital markets and the flow of funds within these markets. Other main areas of the course include erm structure and risk structure of interes







 thes in which firms operate ortunities on business decisions; the hich business decisions are made and

Commerce 208A/B, Commerce 215A, merce 216B.
312A Managerial Accounting, lect.: 3 hrs.; E.
ory cost analysis for control and tral financial ring. Selected problems ted statements, tax allocation, price level Treepuisites: Commerce 101, Commerce

Vote: Students whose major area of concentraAccounting should take Commerce 301
mmerce 310 and should not take this

## ${ }^{3}$ isheibellhut.

er market structure and behavior and mpact upon the firm's competitive uisites: Commerce 208A/B.
${ }^{3} 4_{\text {A/B }}$ Sales Management, lect.: 3 hrs.; J.
assets and the efficiency of Canada's capital
markets. The class will be conducted in term of reading assignments, case-analysis, evaluation of available research results and classroom
discussion. discussion.
204, and Economics $221 \mathrm{~A} / \mathrm{B}$.
450 Accounting Theory and Systems, (for honours students), lect.: 2 hrs.; C. W. Schandl

The class makes independent investigations in the philosophy of accounting and auditing, based on recent literature.
Topics studied include information theory, role and function of "theory", measurement theory, systems, accounting systems; the concept of investigation in the nature of "evidence" current problems of accounting and auditing a Prerequisite: Commerce 310 .

451 Management Control Systems and Auditing, lect.: 3 hrs.; C. W. Schandl.
This class explores the concepts of management control systems, their establishment and review together with the standards and procedures
involved in the attest function (auditing). The role of the computer and statistical sampling in the attest function are examined. The problems of undertaking investigations for special report
are also considered.

This class is required for honours students in
accounting and it should be taken by those accounting and it should be taken by those
persons contemplating an accounting career. ${ }_{\text {prerequisite: }}$ Commerce 310

452 Advanced Accounting, lect.: 3 hrs., Matthews.

The class considers the accounting and re porting theory of business expansion and contraction. Partnerships and consignments are
discussed. The theory and problems involved in discussed. The theory and problems involved in
business reorganizations and liquidations are business reorg
also explored.

This class is required for honours students in accounting and it should be taken by those ${ }_{P}{ }^{\text {prsersens contemplating an accounting career. }}$
Prerequisite: Commerce 310

## 460 Seminar in Finance

Special seminar restricted to honors students in

## 465 Seminar in Marketing

Provides an opportunity for advanced students in marketing to examine recent marketing
developments and to study intensively selected developments and to study intensively selected
facets of marketing management. Restricted to
facets of marketing manageme
honors students in Marketing.

470 Seminar in Organizational Behavior
Special seminar restricted to honors students in Organizational Behavior.

Comparative Literature
Teaching Staff
R. Friedrich (Classics)
G. Ilgner (German)
S. Jones (Spanish)
F. A. Kretschmer (French)
N. Maloff (Russian)
R. M. Martin (Philosophy)
N. Mendel (English)
B. H. Rasmussen (French)
H. R. Runte (French)
R. Runte (French)
M. C. Sandhu (French)
H. S. Whittier (English)

The Departments of Classics, English, French, German, Philosophy, Russian, Spanish and
Theatre, offer the following classes in Theatre, offer the following classes in Compara-
live Literature. These classes may form part an area of concentration. All lectures are given in English, and works read in English transla in Eng
lion.

100 Introduction to Comparative Literature, M Sandhi.

This is an introduction to an understanding o man's approach to the problems of life through the study of selective masterpieces of European literature, which may include works by Dante
Chaucer, Cervantes, Shakespeare, Moliere, Goethe and others.

Note: English 100 or Classics 100 is acceptable s an equivalent to Comparative Literature 10 Or a description of these classes see the en

110 Modern German Literature in Translation, R. Ilgner.

Major works by Hesse, Kafka, Brecht, Böll, Grass, Weiss, Dürrenmatt, and Mann will be and discussed in English. Detailed reading lists will be available from the Department of
German before pre-registration in the summer Practice in written and oral reports will be carried on throughout the year.

3 Masterpieces of Western Literature, lect.: hrs., H. S. Whittier.
This class is intended to provide the student with the opportunity to do intensive reading o
selected major works from Western literature. The selections vary from year to year. The intensive reading is designed to broaden the student's outlook on literature and also to

Generally, works will be taken up logical order. As the class proceed
relationships and comparisons relationships and comparisons of the
and artistic perspectives in the and artistic perspectives in the varia
will be developed. Classes generally combination of lecture and discuss try tutorials are held once a week discussion in addition to class meetings

204 The European Novel, lect.: 2 Mendél.

This class can best be described as a c of about twelve representative no
two hundred years in translation.

## 210 Theories and Manifestation

 Medieval Europe, H. R. Runte.A literary and anthropological study poetic, romanesque, and dramatic
English courtly poets, French trout German Minnesänger, with special on their relation to our time.

212 The Realistic Novel in 18th France and England, R. Runte.
A study of memoirs and epistolary Eighteenth century England and Fr
reveal a close interrelationship betw reveal a close interrelationship bet
works of Marivaux, Richardson, Rousseau, Restif and Diderot. Ot representative of these genres by Fielding and Smollett will also be studied

254 Myth in Dramatic Literature F. Kretschmer.

The class will examine the use of classical in dramatic literature to formulate st about man and will explore the or
270 Philosophy in Literature, lect. sion: 2 hrs.; R. M. Martin.

Many important works of literature much philosophical material. Some works unless he cannot fully apprecia philosophical he has an understanding philosophical traditions and issues
This class is designed for two sorts of those with literary interests who wish about and discuss the philosophical issus in several modern important literary those who are students of philosophy would like to investigate literary occur
philosophical ideas. Readings will inclu philosophical ideas. Readings will inclu
works of Dostoyevski, Sartre, Camus, Nietzsche, Peter Weiss, Beckett, Hem Hesse and Brecht.

306/A Dostoevsky, (New course ted), lect.: 2 hrs.; N. Maloff
is designed to give the student an Dostoevsky's creative work through Isis of English. mystery: if you spend your entire life mystery: if you spend your entire life puzzled your time. I occupy myself mystery, because I want to be a man.' ( tors of world literature: Dante Miters of Pascal and Tolstoy. Long freud and the school of psychoanalysts, sky analysed the depths of the subconYet psychology for him was not an end means. He remarked: "I am called gist; this is not true, for am a realist
ighest sense, i.e. I depict all the depths higher soul."
fence of God has also "tormented" his ff e and he foresaw history in the light o ocalypse to be culminated in the
nation of the world by the "new and surrection"
ouse is designed for students wishing to acquainted with Tolstoy's thoughts and rough an analysis of his ma
will be conducted in English.
and Dostoevsky are the two great , standing apart in the propylaeum of Tolstoy has been given to the world fo pose of being "contrasted with Dostoev sid D. S. Mirsky.
Dostoevsky is considered the "surgeon human soul", and Tolstoy a "doctor of
s talents and genius enabled him to the search for identity in 19th century and to interpret it through his own

- a sense of being the great world he about. For him self-awareness among all should be based on "reason, that is,
pean Romanticism, M. Sandhu
class will study the origins, main trends, themes of the Romantic movement in ny, France, England and Russia, with ce to the works of its most important
natives, e.g. Schlegel, Hugo, Byron, nov, Pushkin and others. Periodic guest in other fields of human accomplish music, painting, etc.
computer Science
economics


## Professors

R. E. George
J. F. Graham
J. G. Head
Z. A. Konczacki
N. H. Morse (on leave 1973-74)
Y. Murata

Associate Professors
R. L. Comea
P. B. Huber
E. Klein (on leave 1973-74)
C. T. Marfels
C. Steinberg

Assistant Professor
F. M. Bradfield
C. M. Ouellette (on leave 1973-74)
T. A. Pinfold
U. L. G. Rio

The aim of social science is to understand how societies function and how they develop.
Economics is one of the social sciences and is Economics is one of the social sciences and is
concerned with a particular set of activities related to the production, exchange and consumption of goods and services. These activities in a region or nation constitute an economy. Economics also studies how incomes are earned
in an economy, why the level of economic in an economy, why the level of economic
activity is what it is, and how different economies or countries are related to one another. To understand the operation of an economy is to be able to predict the effects of changes in any of its parts. It is this power of prediction which makes the study of economics
relevant to current problems, because ecorelevant to current problems, because eco-
nomics can deal with certain questions which our society deems significant such as: how can jobs be made available so that young people ready to earn a living can find work, and do rising prices hinder improvements in the stand-

To answer such questions, one must employ economic theory. This is a systematic body of principles that has been developed to explain
the operation of an economy as a whole as well the operation of an economy as a whole as well
as the interconnections of its parts. Training in as the interconnections of its parts. Training in
this theory is essential to any study of economics. Over time, economic theory has been refined by applying statistical techniques to test hypotheses about economic behaviour. Because of this use of statistics, and because much of economic analysis can be simply and precisely expressed in mathematical form, the
student of economics will find some knowledge of mathematics and statistics helpful.

Economic theory is used for the interpretation and analysis of a wide variety of problems in various fields of study within economics. Some of the more important of these fields are labour history, international trade, money and bank-

- $x$ the organization of industry. The programmes of study leading to a B.A. in economics allow considerable flexibility in order to accommodate a variety of interests on the part of students, and it is possible to combine economics and another related discipline such as political science, sociology, history or mathematics. Students who wish to acquire a more
intensive and broadly based understanding of economics than is possible in the General B.A. course should seriously consider taking an honours degree course.
Students graduating in economics find many well-paid and interesting opportunities for employment it ions in ing universities, business,
istrative positions in government and international organizations.


## General Degree Programmes

The department offers undergraduate and graduate programmes in economics. Students should consult the timetable and the leper in
ment at the time of registration for changes in or additions to the courses listed here.
Economics can be taken as the major subject in a general B.A. or B.Com. degree programme, a general B.A. or B.Com. 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), or 322 .

As a guide to the student who is majoring in Economics, the following outline represents a course strut
programme

Recon I
dded Course Structure

1. Economics 100 or Economics 110
2. Mathematics 100 or Mathematics 110

3-5. Three classes chosen from fields other

Year II
6-7. Economics 220 (A or B); Economics 221 (A or B); Economics 222 or 322 .
9. 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 at least one of which is not in Economics.

Students considering economics as an area bout their programme.
-
although students may offer fewer classes in conomics than the seven suggested, this num
 n
 fields other n

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 ${ }^{n}$ d er  ? -
increase his familiarity with works that are not
only stimulating in themselves but also com-
knowledge of the discipline and should be The following course structure is recomreaduate 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 ,

Concentrated Integrated Programme course course structure which may be of interest to two-year M.A. programme or for work for a economist. The Concentrated Integrated Pro gramme differs from the normal course of study since students will work on one class at time, rather than the usual five, in their third year. The third year consists solely of eco-
nomics classes taken in sequence, whereas the nomics classes taken in sequence, whereas the
second year would consist primarily of classes in other subjects.

The integrated third year will be structured as follows (with options depending on whethe the student is interested in an M.A. or in employment)
Weeks of Term Segment of Programme $\begin{array}{ll}\text { 1-4 } & \text { Micro theory } \\ 5-7 & \text { Macro theory }\end{array}$
${ }_{8-10}^{5-}$ Advanced theory or
11-14 applied field
$\begin{array}{ll}15-17 & \begin{array}{l}\text { Ecconomics History } \\ \text { EHistory of Econo }\end{array} \\ 18-19 & \text { Hist }\end{array}$
18-19 History of Economic Thought
$\begin{array}{cc}\text { 20-26 } & \begin{array}{c}\text { or applied field } \\ \text { Applied Fields (3) } \\ \text { Policy semin }\end{array}\end{array}$
Students who are interested in applying to enter the programme in September, 1973 , o
who wish to know more about it who wish to know more about it, should
contact Professor F. M. Bradfield, Department of Economics, before April 30, 1973. The programme is designed for a maximum of 20 students and a minimum of 10 students.

## African Studies Programme

The Department is cooperating with several other Departments in offering an African
Studies Programme. Interested students should contact Professor Z. A. Konczacki.

## Other Programmes

The Department is prepared to assist students
who may wish to devise their own programme who may wish to devise their own programmes
under the present curriculum regulations. Interested students should consult Professor F. M Bradfield, the Undergraduate Co-ordinator.

Honours Degree Programme
The necessary core courses for an Honours Degree in Economics are: Economics 100 or
Dess 110; Economics 220 (A or B); Economics 221 (A or B); Economics 320 (A or B); Economics
321 (A or B); Economics 322; Mathematics 110; a course in Economic History; a course in the History of Economic Thought.

1. Economics 100 or 110 .

3-5. Three classes in fields other than Economics.

Year II
6. Economics 220 (A or B) and 221 (A or B). 7. Economics 322
class Economics 232 or other economic history
9-10. Two classes chosen from fields other than Economics

Years III and IV
11-16. Six economics classes including 327 320 (A or B), 321 (A or B) 17-20. Four classes in other areas chosen in consultation with the Department.

The student's programme will be chosen in consultation with the department and must have the approval of the department.
Honours students must pass a comprehensive xamination 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
the third and fourth year, students must
include at least two classes above the elemen
ry level.
tudents are advised that mathematics is re quired for graduate work in most good graduate
schools. The value of Econometrics and of schools. The value of Econometrics and
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 o
requirements for the General B.A. degree.

Combined Honours
Combined honours programmes may be arranged with other departments. For combined onours programmes with economics where the major concentration is in the other discipline concerned.

## Classes Offered

100 Introductory Economics, lect.: 2 hrs
tutorial 1 hr ., R. I. McAllister, A. Sinclair.
The Economics 100 class is designed to provide general introduction to the science
economics and to introduce students to the ways in which economic science can be applied to resolve economic problems. To these ends the class has been designed: first, to give a quick survey of the important principles, terms and
methods employed by the economist and, then,
in the second half of the year, the ba
of the first term will be applied by identifying specific economic prob employing the tools of economics to them and to propose policies for their At the mid-term, students with a gract Economics 100 or of going into E 220B or Economics 221B. Consult th
graduate Coordinator, M. Bradfield, for
110 Introductory Economics: A Math Approach, lect.: 2 hrs., tutorial
Pinfold.

This is an introductory class for stude background in mathematics. Similar nomics 100, the class is designed to
general introduction to economic to introduce students to the way economic analysis can be applied to economic problems. However, the taken to the material will be more Mathematical tools will play an integra developing the theorems and proofs.
ledge of differential calculus would be

At the mid-term, students with a grat have the option of continuing with E 110 or of going into Economics 220B Consult the Undergraduate Coordin Bradfield, for details.

220A/B Micro-Economic Theory I, lect (offered both terms).
Microeconomics deals with the ec haviour of households as purchasers
and suppliers of input services, and of and suppliers of input services, and of as well with the behaviour of gro in this area which may be required f classes in economics at the 200 to 4 algebra are employed.

In addition to standard topics such as and producer behaviour under various structures, an introductory treatment o equilibrium, external economies, and
economics is included. Although the emphasis is on theoretical ideas, applic these ideas are considered, in order to ill the range and power of micro-economi in dealing with practical economic issue Prerequisite. Introductory Economics.

21A/B Macro-Economic Theory, lect (offered in both terms), G. A. B. Karts Murata, A. M. Sinclair.
This class is intended to provide a reatment of macro-economic theory to
a basis for other classes in economic equire a knowledge of macro-econom class is not mathematical in its treatmen material. Topics covered include: nat interest, mones, the theory of e
rowth. Both "open" and "closed" are considered. Major emphasis is the development of the theoretical Introductory Economics.
mic Statistics I (same as Commerc

## s.; R. E.

tudied include the definition, functions of statistics; the design and of statistical enquiries; statistical dispersion, skewness and kurtosis dispersion, skewness and kurtosis; on in population from samples, and ypotheses about means and propor quality control; index numbers; tim ysis; elementary correlation.
und knowledge that is essential for this ludes: algebra at approximately Grade some experience of constructing and
ing graphs; the ability to think quantit hich is usually gained by the study of and algebra at the high school and
level; familiarity with national level; fa
concepts.

232 Canadian Econ
(sme as History 222 ).
of C study of the economic of Canada from the age of beginning has formed part of a larger the approach taken in the class is to
Canadian economic history in relation larger system which can be broadly d and analyzed in terms of the relation etween the Old World and the New. The refore covers areas of economic history
considered to be relevant to an e considered to be relevant to an
anding of the economic development of The aim is to make the class a unit as possible by using themes of trade, ity, technology, vested interests, ins, and so forth, as a means of developargument. As the class proceeds, the
hifts more and more towards Canada, hifts more and more towards Canada,
general subject matter deals with the ion of Europeans coming from across ntic and across Siberia into the Western here. The class therefore is a study in mation and breakup or change in
the shifting balance of power between the shifting balance of power between and regions, the role of the Caribbean minence, and Canadian responses to anges and to internal problems as well.
eory is introduced towards the end of han is used in the earlier parts, as
eory is helpful in discussing Canadian and policies, especially in the century. However, no strict prere are required, although a class in
principles and some knowledge of principles and some knowledge of
ould be beneficial.

234A Pre-Colonial Economic 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 prepare
study.
The topics considered include: methodology of African economic history; the significance of tions on economic prehistory; economic con tacts between distinct ecological regions and different cultures; introduction and spread of agricultural crops; landholding systems; mining and metal-working; long-distance trade routes nd trade centers; overseas trade; slavery 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 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 this class deals with an era which began with 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 discussed include: development of trans port; mining; agriculture and trade; som aspects of investment and technological dif fusion; growth of labour force and the prob lems of migrant workers; colonial planning socioeconomic impact of European coloniza
tion on Africans; African response to economi incentives; a balance-sheet of conilim

No prerequistes are required, although roductory Economics and Economics 234 are desirable.

236B Recent Economic Developments in Sub Saharan Africa, seminar: 2 hrs.; Z. aharan Africa, seminar: 2 hrs
Konczacki (not offered in 1973-74).

This seminar centres on the discussion of the impact of colonial heritage, present structure of frican economies, problems of economi infrastructure, African agriculture, mineral de emphasis on import-substitution, problems rade: overseas and intra-African, foreign invest ment and aid programs, economic planning, and prospects for the future of African econom development.

241A Comparative Economic Systems: Nation al Economies, seminar: 2 hrs., P. B. Huber.
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 conomies. 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.

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 provides the basis for consideration of the theory and practice of economic planning at micro-economic and macro-economic levels in various institutional contexts. Read, Galbraith, Mishan, Tinbergen, and Ward.
Prerequisite: Introductory Economics, plus an additional half-class in Economics.
250 Applied Development Economics, seminar: 2 hrs . and tutorials, R. I. McAllister

The purpose of this class is to enable partici pants to review some main lessons from experience, and to apply this backparaive experience, and to apply this background by

The class consists of several main strands, which often run concurrently. These include:

1. Economic Development in theory and practice. A survey of some main development
theories and their implications, drawing on the experiences of selected countries and regions including the Atlantic Provinces.
2. Development Planning. Particular attention will be given to the Canadian social, political utilised from World Bank experience in developing countries, from Canadian and O.E.C.D. member countries at various levels of covernment, and from the private sector. Regional, urban and rural, as well as national planning, will be reviewed.
3. Policy effectiveness. How do policies really evolve? How do they translate into programs
and projects? What is the process of formulation, implementation and evaluation really like? What techniques are and evaluation really like?

66
cost-effectiveness of development planning e.g.
program budgets, cost-benefit analysis, criticalpath scheduling etc.
4. Application. The gist of development theory and comparative case study experience Project teams will review how agencies in the Atlantic region are planning and budgeting largely through extensive interviews. Teams will also tackle projects that government agencies and private sector organizations are currently
working on. This will provide class members with experience in working at problems that often require an inter-disciplinary approach, and will give them practice in harnessing information and advice from a range of sources.
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 experience of development economics in experien
2. 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 situavalue
tions.
Prerequisites: Introductory Economics or degree in a related discipline. The work requirements are streamed to fit students' back-
grounds. grounds.

Resources. Experienced advisers from governResources. Experienced advisers from govern-
ment and private agencies will add further
perspective and guidance by participating in ment and private agencies will add further some aspects of this class.
320B Micro-Economic Theory II, lect.: 3 hrs.; G. A. B. Kartsaklis.

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 pricing of factors of production. This is
followed by a discussion of problems of market followed by a discussion of problems of market
conduct under oligopoly: collusive behaviour, administered prices, and basing-point prices are
the main issues in this part The last the main issues in this part. The last part of the
class covers problems of resource allocation and class covers problems of resource allocation and
of welfare economics. This class will be of particular value for students intending to do
graduate work in Economics. A knowledge of graduate work in Economics. A knowledge of
calculus would be useful. calculus would be useful.
Prerequisites: Mathematics 110 and Economics
$220 \mathrm{~A} / \mathrm{B}$ which may not be taken concurrently
321A Macro-Economic Theory II, lect.: 3 hrs.; G. A. B. Kartsaklis.

This is a class for persons who wish to do
latively advanced work in economic theory, possibly with the thought of going dass will assume sore knowledge of cal culus. Topics covered include: classical models of income and employment; Keynes theory of economic growth (including two sector models); and trade cycle models. Prerequisite: Economics $221 \mathrm{~A} / \mathrm{B}$ and Mathe matics 110 (or equivalent).
32 Intermediate Statistics, lect.: 3 hrs.; U. I . Rao.
The student who is familiar with the basic statistical theory can mpeciut whe bas echnique better than one who has had a formal training in statistics, which involves training in omputational aspects of statistical measure 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; is presumed that advanced techniques of eco nometrics can be understood by the student who has taken this class.
This class concentrates on the Theory of Probability, building from an axiomatic poin
of view, mathematical expectation generating function, and statistical inference.

Multiple linear regression models will be dis cussed and a critique of various problems that ise consequent to violations of the assump presented. This will prepare model will be undertake applied econometric work; besides, it would provide a spring-board for the student to take up advanced econometrics.
The student is expected to have at least 100) and preferably linear algebra too troductory Economics is also required.

324 Public Finance, lect.: 2 hrs.; tutorial 1 hr J. G. Head

Economics 324 is concerned with the principles of public finance and their application. The first part of the class deals with the objectives
of public policy and the reasons for market of public policy and the reasons for marke theory of public expenditure which is illustrat ed by reference to the major economic func tions of government.
The second part of the class is concerned with the theory of taxation in relation to the objectives of public policy. This section explores the possible role of a sample of
important taxes in the design of a good tax system. The third section examines the role of
public finance in relation to economic fion. The final section considers the problems of public finance in a federal The analysis of the various sections lustrated from and applied to th ystems of Canada and other countries.
Prerequisite:
Introductory nomics $220 \mathrm{~A} / \mathrm{B}$ and $221 \mathrm{~A} / \mathrm{B}$ are desire

325 Labour Eec
hrs.; C. Steinberg
Some nine million Canadians dependent upon wages and salaries for National Income. Over two million workers belong to trade unions in sectors of our economy. Economic an he factors affecting wages and salaries, labour, and the labour market is important to an understanding of the as a whole.
The subject is introduced by emergence of the labour problem; the growth, structure and outlook of mar and the historical and legal founda labour relations.

## Most of the year is spent in

a) Analysis of the supply of and dema labour
b) Examination of the theory and pra collective bargaining, exploring also the tion and relative strengths of markel nomic) forces, and institutional (gove nion-employer) forces
income and the relative effect of the d) Analysis of the determinants of ment in the macro-economic sense, and easurement and problems of unempl
We conclude with a review of public with respect to labour, and an effort
hroughout to relate current events theoretical framework.

The class structure is intended to be however, as a base it has two lectures provide the materials) each week. Prerequisite: Introductory Economics interest in social science and its conomics $220 \mathrm{~A} / \mathrm{B}$ and $221 \mathrm{~A} / \mathrm{B}$ are
326B Money and Banking, lect.: 3 hrs Comeau

The class is concerned with tracing the of money and financial system on the $e$ and, in particular, the impact that it such aspects of the economy as the
employment, the rate of inflation balance of payments. The principles operation of banks and of other institutions are discussed, but major er
placed upon the influence of the in
n their detailed modes of operation. orary Canadian institutions form the he course, and Canadian experience in of monetary policy to influence the
is examined. A knowledge of marcocs is assumed.

## ite: Economics 221A/B.

riefly, market structure refers to the number and size distribution of firms in general and to conduct the pricing process is discussed; market performance concerns the problem of the egree of optimality of allocation of resources. The latter part includes a discussion abou whe ther a reallocation of resources is necessary, f public policies directed towards business. Prerequisite: Economics 220A/B or equivalent micro-economics course.
oach taken in this class is to study roach taken in this class have made in tellectual efforts that men have mena". A urvey of medieval and mercantilist is followed by an examination of classical political economy and Marxian ics together with that of other sociafocus then shifts to the marginalists,
cists, and the institutionalists. Probeconomic instability and depression economis century, require that some n be given to Keynesian economics and ensions. The time allotted to the study of $n$ writers and schools and of various
porary writers and current topics deporary writers and current interests of students. It is ed that the tremendous expansion of erature and the emergence of highly ed fields in economics makes it necess select from recent sources only a y small sample of writings which relate The links can be forged, nevertheless, by of a number of topics such as the g: the theory of value, the treatment of the theory of economic growth, the disuban, and the relationshi
this class is intended to supply a und for several other classes in eco , it is also true that other classes serve a ound for this one. It is considered
, however, that students in this class al, however, that students in this class aken a class in economic principles. A
micro-economics (price theory) and in conomics (income determination) be helpful. The presentation, except for specific points, is largely non-mathe-
Therefore, the main requirement of Therefore, the main requirement of body of literature rather quickly. isite: Economics $220 \mathrm{~A} / \mathrm{B}$ and $221 \mathrm{~A} / \mathrm{B}$ ommended.
Industrial Organization, seminar: 2 hrs.; C.

Oral Onization is the application of the of price theory to economic reality. In a industry, the problems of a firm ting successfully with its rivals in order
nly to survive but to accuire a higher nly to survive but to acquire a higher
$t$ share are far more complex than those in heory where we have to deal with more simplified assumptions to find a solution The traditional approach to the analysis competitive process in an industry is
into three parts: market structure, into three parts: market structure,
conduct, and market performance. are the three main parts of the class.

329 Urban Economics, lect.: 3 hrs.; T. A Pinfold.
Urban Economics is essentially the application of tools of economic analysis to the problem of 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 pax choice.
Prerequisites: It is strongly recommended that
students have a sound background in both macro- and micro-economics. Economics $220 \mathrm{~A} / \mathrm{B}$ and $221 \mathrm{~A} / \mathrm{B}$, or their equivalent would be a minimum. The class is designed as an
application of theoretical tools. No theory will application of theoretical tools. No theory wil 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.;

This class considers the causes of international and interregional exchange of goods and services and analyzes the effects of inter-
national 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. Depending upon class interest and availabily of time, the subjects of
economic integration and of Canadian commercial policy may be discussed in some detail. Prerequisite: Introductory Economics and $220 \mathrm{~A} / \mathrm{B}$, or two full-year classes in economics. The entering student must have a reasonably good grasp of micro-economic theory. In
addition, the ability to follow arguments addition, the ability to follow arguments
couched in terms of high school mathematics is essential since part of the exposition by the lecturer makes use of algebraic and mathe matical techniques.
333A Theories of Economic Development lect.: 2 hrs.; tutorial 1 hrs.; Z. A. Konczacki.

The purpose of this class is to provide
heoretical framework for the understanding of heoretical framework for the understanding
the process of economic development in the more and the less developed countries with a
view to an eventual application of this frame view to an eventual application of this fra,
work to the solution of practical problems.
Topics considered include: basic definitions and dopics considered include: basic definitions; measurement of economic magnitudes; characteristics of the less developed countries; selected theories and models of economic development and their appraisal. The concluding seminars are devoted to the problem of the foundations of the theory of econ the concepts of unilinear and multilinear evolution is discussed.
in in macro-economics equivalent to Economics desirable.

334B Policy I seminar 2 hrs.

This class is concerned with the application of economic theory to selected developmental economic The role of capital formation in saving by inflation, domestic taxation, and foreign aid are considered as atternative ways of
increasing the rate of capital formation. The focus of the class then shifts to the problem associated with choosing the best use of investible resources from such alternatives as investment in education, research, population control, and the reformation of institutions and a discussion of investment criteria, programming models, and developmental strate${ }_{P}^{\text {gies. }}$
Prerequisite: One half-year class in economic development, or Economics 241A ,

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 industrialised countries in general. The interdependence of economic
political and social forces is markedly in political and social forces is minal policies,
evidence in the evolution of regional and while this course will be oriented largely from a concern with the economic forces
underlying the process - these other factors underlying the process - these other factors
will be taken into consideration. The approach will be taken into consideration. The approach will contain four main elements: (a) the
application of economic 'principles' in the application of economic 'principles in the
context of regional development; (b) a comparative review of regional development experiences and policies of a number of in dustrialized countries; (c) Canadian regional development experiences, with particular focus on the Atlantic region; (d) regional field case
study; each student will examine the back ground and role of one pertinent project such as D.E.V.C.O. in Cape Breton, the Newfound
land centralization program, the Saint John 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.

422 Econometrics, lect.: 3 hrs.; U. L. G. Rao.
This class attempts to introduce Econometric theory at a fairly advanced level and is designed model-building.

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, gen eralized least squares, Autocorrelation, Heteroskedasticity, distributed lags and dummy variables. All these problems are single equation problems.
Simultaneous equation problems occupy an important place in econometric model-building. tion and single equation bias will be made.

Limited information methods and full information methods of estimation will be disucssed.
Monto Carlo methods as alternatives to anaytical technqiues will be discussed.

This class requires a high level of work and is open to graduate as well as undergraduate students. Minimum prerequisites for undergraduates will be an undergraduate statistics
course and undergraduate work in micro- and macro-economics. The prerequisites are Economics 322 and $220 \mathrm{~A} / \mathrm{B}$ and $221 \mathrm{~A} / \mathrm{B}$.
423A International Economics of Develop-
ment, seminar: 2 hrs.
This class applies international economic theory to problems of economic development policy. opics discussed include the terms-of.trade,
external balance, foreign aid, private foreign investment, commercial policy, and development through trade. Approximately one-half of he readings is concerned with foreign aid. oreign aid in relation economic objectives of security objectives; the foundations of modern aid theories and strategies in development heories; the macro-economics of aid, including absorptive capacity, debt service, and loan terms; the micro-economics of aid, including economic criteria for project assistance and aid strategies; and factors affecting the burden of aid upon the donor countries.
rerequisite: One half-year class in either nomics.

424B Economic Development and Ecology seminar 2 hrs.; Z. A. Konczacki.
This seminar is offered to the students whose interest in economics or natural sciences com-
bines with an interest in environmental problems. The approach reflects an economist's view of the relationship between ecological questions
and his own discipline. Topics considered and his own discipline. Topics considered
include: modern approach to economic de velopment and the lessons of experience theory of economic development and the scientific view of man and nature; determinants
of living levels; population: theory and policy of living levels; population: theory and policy;
environmental preservation; problems of ecoenvironmental preservation; problems of eco-
nomic efficiency; control systems; some probnomic efficiency; control systems; some problems of research methodology; case studies of
the relation between economic developmen and eco-systems in the less and the more developed parts of the world.
Prerequisite:
Prerequisite: Economics 333A. Students may
also be admitted with special permision special permission of the instructor.

426B Monetary Policy, lect.: 3 hrs.; R. L. Comeau

This class assumes that students have a basic knowledge of monetary institutions and mone tary theory and attempts to develop out of this a critical analysis of the objects and effec-
tiveness of monetary policy with tiveness of monetary policy, with particular
attention to the Canadian experience. The first attention to the Canadian experience. The first
part of the class deals with the objectives and instrumental role of monetary policy and introduces such problems as the question of rules versus authority, and the question of lags in monetary policy. The second part is concerned with the effectiveness of monetary
policy and considers issues such as the structure of interest rates, the elasticity of spending to changes in interest, the availability doctrine, the problems for policy of a fixed versus flexible exchange rate and the discriminatory effects of
monetary policy. The last part monetary policy. The last part considers the
adequacy of the tools of monetary policy, particularly in the light of the Canadian money market experience. Prerequisite: Economics 326A.

Economics 431B International Payments, seminar: 2 hrs.
Selected topics in recent international monet ary history are examined, the causes of and
remedies for external inbalance in national remedies or external inbalance in national tion of the international monetary system is discussed. Depending upon class interest, certain issues of international development
finance and problems of instability finance and problems of instability and growth
in the international economy may be discussed in detail.
substantial proportion of class time is devoted to the discussion of papers prepared by students. A comprehansive reading list is dis-
tributed. ributed
$220 \mathrm{~A} / \mathrm{B}$. These are strict prerequisites in the
ense that they must be completed be tudent enrolls in the class
In addition the ability to follow ar essential since part of the exposition of algebraic and mathematical techniques

## 432 Regional Economics, seminar 2 hrs

 Bradfield.
## Regional economics applies economic th

 the problems created by the differentia evenomic change on the region o develop a logical analytical approacl problems of regional development. The evelops an understanding of the basi tion or amelioration. When the basic pir are understood, policy issues become and easier to analyze. The course will op if the class were a research unit assigntask of preparing a rigorous developm task of preparing a rigorous developmen Scotia, or ar the Maritimes, given the interests of the class). The class will def various areas or components of the pla assign tasks to members of the class, e individuals or teams. Class time will be nalyzing areas, defining needs and d he individuals working in those areas.
will be discussed while being worked seminar papers when completed. The pr will not lecture to the class but will, w rest of the class, question assumptio analyses, suggest directions, and if ne erve as referee.
Prerequisite: Economics $220 \mathrm{~A} / \mathrm{B}$ and 221
Students must have a knowledge Sudents must have a knowledge of
macro- and price theory, especially the mechanisms determining factor flows and production relationships between factor productivities and proportions.

440 Applied Development Economic 2 hrs. and tutorials; R. I. McAllister.
For description see Economics 250.
448A Philosophy, Politics and Eco same as Philosophy 448A and Politica
48 A ), seminar: 2 hrs.; D. Braybrooke.

449B Philosophy, Politics and Economics as Philosophy 449B and Political 449B), seminar: 2 hrs.; D. Braybrooke.

450 Senior Seminar on Economic seminar: 2 hrs.; J. F. Graham.
This seminar is intended primarily for in the last year of their undergra
gramme who are concentrating honours in economics. It is expected t that the class will be small and that it made up of those who have a strong in economics and who have sufficient prep general and specific policy issues. Th
will depend party on the paicula of the students in the class.

Almost everyone nowadays is aware of the importance of the process of education in the modern world. A modern advanced society like our own, when compared with earlier or simpler societies, is characterised by the unheritage, that is of the total fund of knowledge, skills laws customs, and attitudes it possesses. To pass on this heritage (or the relevant parts of it), and to foster conditions under which it may be enlarged and purified, becomes a major task. The task might be made easier if biologically each generation could start
the learning process where the last left off, if, the learning process where the last left off, if,
for example, the new generation were endowed at birth with speech and the ability to read, write and count. But, whether we might wish it or not, things are not arranged in that way and
each generation must start from the beginning. each generation must start from the beginning.
As each generation, taken as a whole, always As each generation, taken as a whole, always
has more to learn than the last, (and in modern has more to learn than the last, (and in modern
conditions frequently much more), and as there is a continual need for adaptation to changing conditions, it is clear that the problems of modern education are manifold and complex and the challenge severe.

Educational ideas are in ferment at the present time and serious voices can be heard taking very different positions on such matters as student responsibility, discipline, specialisation in High School, and teaching methods. At the same time new ideas (or in some cases, old ideas in
new guises) challenge the student teacher, e.g. teamteäching, micro-teaching and continuous progress. Is a system of public schooling defensible at all? To what extent is teaching neutrality possible or desirable? Clearly to enter an education programme at such a time is not sensibly expect ready answers to such issues and problems. The Department of Education at Dalhousie is concerned to involve the student in such problems, to call attenition to the relevant literature, and to aim at a high level of intellectual inquiry. It is vital that the student
challenge ideas which he will encounter, and think out his or her own position on the issues. This is no more than to point out what is true of educational processes at all levels, that they are concerned to develop understanding. This general outlook permeates the whole pro-
gramme, including academic courses and methgramme, including academic courses and meth-
ods courses as well as the periods of Field Experience. Involvement cannot be summarised in terms of "listening and learning" but extends to contributing, rejecting, debating, experimenting and so on

## Facilities of the Department

The Department occupies a three-building complex, organised around a Learning Resource Centre which consists of five units: Field Development Unit, Learning Materials Unit;

Interpersonal Relations Unit; and the Audio

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Iman (part-time)
ociate Professors
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Semple (Chairman)
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ant Professors
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D. Paré
E. Poole

## L. Sharma

Bremer
J. Meade

Teaching Ass
B. Deville
B. De Ville

- Field Development Officer


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visual Unit. When fully renovated the Centre will place an emphasis on open space and the mobility of people, equipment and material Further information about the Learning Re source Centre, and its relationship to the programmes of the Department, may be Programmes request from the Secretary, B.E

The Department offers:

1. a four year integrated course at the end of which students are awarded simultaneously the degrees of B.A. or B.Sc.sand B.Ed., and
2. a sequential course of one year which may be taken by students who have already com-
pleted a B.A., B.Sc., or B. Comm. or otherwise fulfill the requirements for admission to the B.Ed. programme, and at the end of which the degree of B.Ed. is awarded.
3. two classes which may be used for credit towards a B.A. or B.Sc. (Education 401 and 402).

The instruction offered in the education classes is substantially the same in both courses: in the sequential course however, all are offered
during the same academic year while in the integrated course, the classes in education are integrated with academic classes in the second, third and fourth years, the first year being
confined to the regular classes required for the B.A. or B.Sc. degree. A student wishing to enter the integrated course must apply to the department during the first year at the latest.
Traditionally the programmes are divided into Elementary and Secondary. The divisions are the large number of options available in some courses. Requests for different course combinations are allowed by the department.
The Department is also encouraging the development of experimental projects involving Studente courses to the traditional ones. projects are inested in participating in such Departmental Application Form and to discuss possibilities during their interview for admission.

## Certification of Teachers

Licenses to teach are issued by the Nova Scotia Licenses to teach are issued by the Nova Scotia
Department of Education. A B.Ed. has entitled the holder to a Teachers' Certificate, Class 5 in the past. According to the regulations of the Province of Nova Scotia, every applicant for a Teacher's License or Professional Certificate must submit with his application, documentary
evidence (in a form prescribed by the Minister of Education) respecting the applicant's moral character, age, health, training and qualifications. Further information may be obtained from the Registrar, Nova Scotia Department of may expect to receive a Class 4 certificate.

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e g e e . y expect to receive a Class 4 certificate.

Scholarships
The Nova Scotia Department of Education no programme who intend to teach in the progra
vince.
Details of Dalhousie scholarships and other funding sources are given in the information supplied to applicants.

## Degree Programmes

B.Ed. Elementary and Secondary Sequential (One-year) Course
Entry Requirement

1. B.A., B.Sc., or B.Comm. by September 1973. Candidates with other bachelor degrees
should enquire from the Secretary, B.Ed. Programme.
2. Applications from all students are welcomed. Opportunity to draw attention to
strengths is provided by the letter strengths is provided by the letter of applica-
tion.

## Application

1. Complete Dalhousie University Application Form which is available on request from the Admissions Office, Dalhousie University, Hal fax, Nova Scotia
2. Write to the Secretary, B.Ed. Programme, Department of Education, Dalhousie University stating preference for the Elementary Division or the Secondary Division. In the case of the
Secondary Division specify main teaching subject interests.

Applicants will receive
(a) Department application form
(b) Two reference forms
(c) Further details
irmed by the applicant. which must be con-

Selection is based on:

1. Academic record: All applicants, including Dalhousie graduates, must ensure that their ranscripts are forwarded to the Admissions
2. References.
3. Interview.

Applicants from outside the Maritime Provinces need not attend for interview; other arrangements are made for them.
B.Ed, (Elementary), Sequential Course

Candidates for the degree of B.Ed. (Element ary) must complete successfully the following
academic classes: Education 401 (if not already completed), Education 402 (if not already completed), Education 403, 404 and 406. If either Education 401 or 402 has been completed previously, Education 405 or another academic class may be taken, subject to the
approval of the Department. Candidates must also complete successfully Education 407, 408
(field experience) and an elective approved by
B.Ed. (Secondary), Sequential Course Candidates for the degree of B.Ed. (Secondary) must complete successfully the following academic classes: Education 401 (if not already completed), Education 402 (if not already completed), Education 405, 406 and 407 . If
either Education 401 or 402 has been pleted previously, one other academic class in another department may be taken subject to the approval of the Education Department. Candidates must also complete successfully Education 408 (field experience) and an elec tive approved by the Department.
Students planning a B.Ed. following a B.A. B.Sc. or B.Comm. should be aware that at
present certain areas of concentration in the first degree might not easily lead to effective teaching. They are advised to consult with the Coordinator of the B.Ed. Programme when
drawing up their programme for the first drawing up their programme for the firs
degree.

Diploma in Education
The award of a Diploma in Education was discontinued following Spring Convocation, 1973.

## Transter of Credit

Students who wish to obtain the degree of B.Ed. with transfer of previous credit must obtain the degree of B.A., B.Sc., or B.Comm. B.Ed. programme and successfully co to the Dalhousie University at least two and one-half of the classes required for the Bachelor of Education degree.
Decisions concerning transfer of credit will only be made following consideration of transcripts
and students' intended areas of study Encuires should be directed to the Secretary, B.Ed Programme

$$
\begin{aligned}
& \text { B.Ed.Elementary and Secondary } \\
& \text { Integrated (Four-year) Course }
\end{aligned}
$$

Education courses in the integrated programme are in the process of being re-distributed. The programme for students who will graduate at
the Spring Convocation 1973 is listed below and indicates the general structure of all integrated courses. Details of the distribution of
Education courses for new students entering Education courses for new students entering the time applications are made.

Enquiries, and applications for admission to the Integrated Course, should be made to The Secretary, B.ed. Frgramme by June 15 of the
student's first year at Dalhousie. Students wishing to obtain a B.Ed. (Secondary)
and a B.A. or B.Sc. with honours should and a B.A. or B.Sc. with honours should
consult the Department of Education and the department or departments in which they wish beginning of their second year in order that a
proper sequence of classes may be
Five years from senior matricul ive years from senior matriculatio of study of study.
B.Ed. (Elementary): Integrated Cours Year I
first-ye first year of the course must first-year requirements for the B.A English 100 must Programmes, sectio

Year II
education 401, 403 and 408 (fis perience).
9 -11. Three classes in arts and science.
Year III
2-15. Education 404, 406, 408, and 407 . 16-18. Three classes in arts and science.

Year IV
9-21. Education 402, 408 and an electir 22-24. Three classes in arts and science.

## Overall Requirements

second and subsequent years must equirements set forth in Degree Pro requirements 5.2.1.

Specifically,
A) the major (four to eight classes selectud endance with major departmental Scotion must be in a subject taught Scotian schools.
B. Seven of the nine classes must be at level or above.
c. On registration in his second ye student must declare his major and approved by the department concerned
D. At least one class in English beyond the level must be taken.
E. Electives may be chosen from the listed in groups A, B, C and D Programmes, section 2), or Art History
three classes in Commerce, Computer Engineering, and Humanistic Studies in
$1-5$. The first year of the course must Ist--year requirements for the B. degrees (Degree Programmes, sectio

## Year II $6-8$. Ed

6-8. Education 401, 405, and 408 perience).
9-11. Thre

## Year III

15-18. Education 402, 408 and 406.
15-18. Four classes in arts and science.

Education 407, 408, and one elective Three classes in arts and science.

## Requirement

classes in arts and science chosen in the and subsequent years must meet the 5.2.1. Specifically,
n of the ten classes in arts and science the second and later years must be in jects beyond the 100 level, these should ed to subjects regulary taught in Nov
schools. The seven classes must be so that either five classes are taken in ject and two in the other, or four in one and three in the other.
remaining three arts and science classes the second and subsequent years shall at least one which is beyond the 100
shall be selected from subjects other ose offered to satisfy the requirements previous paragraph. The subjects may be from group A, B, C, and D (Degree
mes, section 2), or Art History, up to lasses in Commerce, Computer Science ring, and Humanistic Studies in Science
registration in his second year, the must declare his major and have by the department concerned.

## Classes Offered

llowing list represents the 1973/74, Minor changes will be noted in the pted into the programme.

Education classes are offered in Sumool. Details may be obtained from the of Summer School and Extension.
several of the classes listed below, e sections have been scheduled in order ommodate the varied academic back s, specific interests and future needs of students. The sections thus provided a choices within the broad subject are sed by the title of the class.
ministration of Education.
lass will examine the federal, provincial hicipal responsibilities for education in rarticular emphasis will be placed on
ducational Implications of Growth and ment from Pre-Birth to Senescense.
ey of the physical, physiological and ynamic factors in the development of theories and research methods will be ced to help explain these norms in
ment. Models of development will be
examined and clinical methods of observation be discussed
401 General Principles: (Sociology of Educa tion).

This class consists of two lecture hours per week. Mainly theorectical, the accent is placed on the rationale and assumptions of educational yystems, socialization in Canadian Society and he positing of alterma ional practices.

The following classes listed under 492 are exactly the same as those offered under 402 . They are designed for Education stidents who have already chosen their required credits from 402 areas and who wish to take further study in
foundations for their final elective credit: this
they can do by selecting other sections of 402 and registering them as 492.

402A(1)/492A(1) The History of Western Educational Thought.
This class will examine the evolution of significant ideas, problems, and issues in
western educational thought from the fifth century B.C. to the nineteenth century

402B(1)/492B(1) The History of Western Educational Thought.

This class examines the evolution of significant deas, problems, and issues in western education Special emphasis is placed upon selected utopian thinkers and other social commentators.

402(2)/492(2) The Development of Scientific and Technical Education, Not offered in

402A(3)/492A(3) Philosophy 218A Introduction to Philosophy of Education.

Conceptual analysis of certain crucial ideas in educational theory such as indoctrinatio discussion, controversy, and miseducation

402B(3)/492B(3) Philosophy 218B Curriculum Problems.
Philosophical investigation of important ideas in curriculum theory such as needs, interests, creativity, aims, and relevance.

## 402(4) British Education and Its Influence on

 Canadian EducationThis class will trace the general growth of education in Britain and examine some relationbe devoted to the relative importance of social class, the Church, and the State, in this growth; and a survey made of contemporary British ducatio

402A(5) The Historical Development of Education in the Canadian Social Context
This class will examine the evolution of education in Canada from colonial times to the placed on the social context of education.

402B(5)/492B(5) The Historical Development of Education in the Canadian Social Context. J. B. Roald

This class will examine the evolution of education in Canada from the 1870's to the present day. Special emphasis
the social context of education.

402(6)/492(6) An Outline of Adult Education. This class will survey the contemporary field of adult education, and examine some of its philosophical and historical antecedents. It is
hoped to provide a limited number of students with an opportunity for some field experience in adult education.

403 Methods of Teaching (Language Arts and Mathematics).

## Language Arts

This class is geared in the primary grades to the total involvement of the child in all areas of communication through a rhythmical approach to language. The class presupposes an openness on the part of the student-teachers which will
facilitate the development of their own potential. Grades $4-6$ build on this foundation in the setting up of Language Experience situations.

## Mathematics

The class will focuss on the learning and teaching of elementary school mathematics through the use of concrete materials. Emphasis
will be placed on a "math lab" approach rather will be placed on a "math lab" approach rather
than on trying to 'cover' the curriculum and beyond. No particular math background is assumed.

404 Methods of Teaching (Science and Social Studies)

## Elementary Science

This class will study the ways children investigate and learn about the material world. Special consideration will be given to the child
as the principal agent in his/her own learning with emphasis on concrete experiences and practical learning activities.

## Social Studies

This class will study ways in which to develop approaches in social studies education appropriate to young children

Methods of Teaching in Junior and Senior High
Students select two of the following half-credit Students select two of the following half-credit
classes $405 \mathrm{C}, 415 \mathrm{C}, 425 \mathrm{C}, 435 \mathrm{C}, 445 \mathrm{C}, 446 \mathrm{C}$ classes $(405 \mathrm{C}, 415 \mathrm{C}, 425 \mathrm{C}, 435 \mathrm{C}, 445 \mathrm{C}, 446 \mathrm{C}$,
$447 \mathrm{C}, 448 \mathrm{C}, 455 \mathrm{C}, 465 \mathrm{C}, 466 \mathrm{C}, 475 \mathrm{C})$. 200 level class in the appropriate subject is required as a prerequisite (or it may be taken concurrently) for every methods course except Geography

405C English
The general goal of this class is to enable prospective teachers to design and put into effect appropriate English curricula for students of junior and senior high school. The class
requires that students do considerable independent planning, work in laboratory and field situations, and extensive reading.
Students taking this class might wish to consult the instructor concerning possible admission to
two full and related classes offered by the two full and related classes offered by the
School of Library Service: LS316 Children's Literature, and LS311 Literature for Young
Adults. Adults.
415C History
Various aspects of curriculum development and competing teaching strategies will be explored. This examination is intended to aid the student
in developing a consistent approach to history and social studies education.
425C Geography
The class will explore the objectives of geographic study; the acquisition of skills and the development of concepts and appreciations. It
will also deal with the preparation of curricular will also deal with the preparation of curricu
units and the use of materials in those units.

Students wishing to take this class without previously having taken an undergraduate class in geography will be required to take Education 416, Geography in Education, as their elective.
435C Mathematics
Computing and mathematics, the nature of mathematical education and its development in school, problem solving, micro-teaching situa-
tions, and contact with the work in local classrooms, form the framework for the course.

436C Curriculum Development in Mathematics
Students wishing to concentrate their methods work in mathematics may join this class to study current developments in North America and Europe and examine units suitable for
inclusion in the Nova Scotia programme. inclusion in the Nova Scotia programme.
Students may register for this class only with written consent of the instructor.
445C Physics
A study of the objectives of a high school physics programme, curriculum development,
subject evaluation, innovation in science teach .

## 446C Chemistry

nis class will study the teaching of chemistry two ways. The first will involve the that is consonant with the nature of the discipline: the second will give consideration to
various curriculums and their basic assumptions and objectives

447C Biology
In addition to studying the current classes in Nova Scotia, ways of harnessing student in-
terest in ecological matters as a means of promoting broader study are considered. A variety of teaching approaches are examined
and seminars and discussions relating to lesson and seminars and discussions relating to lesson planning and science projects are part of the programme.

## 448C Geology

This subject is taught in Grade 12 classes in Nova Scotia. The importance of practical wor is examined by use of experimental labs. The applications of general teaching methods to specific lessons and series of lessons are
demonstrated and practiced. Laboratory sessions provide the student teacher with knowledge to carry out demonstrations required in the teaching of the class and enable him to become familiar with various kinds and arrangements of learning materials and apparatus.

## 465C Methods of Teaching French

Deals with objectives, subject matter, tech niques, materials, curriculum design and testing in teaching French.
Prerequisite: Education 421.

466C Methods of Teaching Germa
Deals with objectives, subject matter, tech niques, materials, curriculum design and testing in teaching German. See also Department of

475C Economics
This class reviewss the basic methods of economic analysis and of teaching economic
concepts. The emphasis is on how to relate concepts. The emphasis is on how to relate
current economic matters to classroom studies Types of lessons, curriculum development, and the use of learning materials and aids are examined.
The following classes listed under 496 are exactly the same as those offered under 406 . They are designed for Education students who
have already chosen their required credits from 406 areas and who wish to take further study in Educational Psychology for their final elective
credit: this they can do by selecting credit: this they can do by selecting other
sections of 406 and registering them as 496 .

406A(1)/496A(1) Educational Psy -
This class will examine varieties learning that differ in kind and manif
A synthesis of association learna learning and purposeful learning into related model will be discussed. Such neurological foundations of learning, growth and language development, formation, complex motivation,
educational objectives and individuali procedures will also be considered.

406A(2)/496A(2) Educational Psychol Secondary Teachers
The primary purpose of this class investigate and discuss the basic prin
Educational Psychology nature of teaching, motivation, and will be examined.
406A(3)/496A(3) Psychology of Language \& Cognition

This class is particularly designed for th have some background in psychology. 1 of discussion should centre around som major contemporary theories in Language and Cognition

## 06B(1)/496B(1) Psychology and Educa

 he Exceptional ChildThis class will attempt to provide a understanding of the term "exceptional An attempt will be made to discuss the sustain the exceptional behavior. diagnostic and remedial processes hildren with expressive and/or recep havior problems (speech, hearing, neurological and non-sensory impairmen be considered. Administrative use of
dardized tests which has generated artif labels, and has led to recent court North America, will also be discussed.
406B(2)/496B(2) Psychology of Ado
The major thrust of this class will be d toward the examination of various temporary issues related to adolescence
evance will be the "watch word" for disc
406B(3)/496B(3) Psychology \& Educa the Young Child
motion the suggests, the intellectual, so now inal growth of the child will be Skinner will be discussed

## 06B(4)/496B(4) Psycho-Diagno

 proaches to Special EducationThe objective of this class will be to special educational practices which att help the "special child" "adjust" to the as it presently exists. Diagnostic appro

The practical laboratory work is intended to four activities with the hope that sufficient interest, depth of knowledge and confidence could be developed in coaching. The student is
involved firstly as a participant, so that skills can be analyzed and learned, and secondly as a teacher of certain parts of the programme, so that teaching and coaching techniques can be improved.

## 411 Drama in Secondary Schools

This class pursues techniques of improvisation that will be suitable to drama in the classroom. Especially directed toward teachers of the active involvement in a situation can invigorate the study of social issues.

412 Music as a Medium in Educatio
This class studies music as a form of expression and its potential contribution to education. The class work is not restricted to specific grade examines the broader question of music and education.

14 Creative Activity in the Art
This class is intended as an aid to those students who would like to teach the arts in an
integrated way at the elementary school level.

Creative Art, Movement,s and Drama are pre sented as independent areas but are constantly nterrelut for work in which students use resource centre and explore the development of resource materials for classroom use.

## 16 Geography in Education

This class is intended to be an introductory one, at first-year level, in which the major concepts and methods of enquiry in geography ent study, and laboratory work, and will dea particularly with the contribution of geograph oo general education

417 Introducation to Audio-visual Media
An introduction to the use and understanding of audio-visual techniques in teaching-learning stuations. The course attempts to cover some and why" of audio-visual media, but als through workshop situations it concentrates. on the "how" aspect of the media.
418 Curriculum and Instruction in Elementary School Reading

This basic course in the teaching of reading is designed to introduce the components of the reading process through an analysis of the students own performance in reading. It wil
the learning process in reading, types of reading programmes in schools, techniques for developing reading skills and abilities, and will involve students in the use of standardized and in-
formal reading tests; the processes of diagnostic formal reading tests; the processes of diagnostic small group and individual activities to explore course topics.
419/509 Combined Seminar Readings in Plato and/or Dewey
This seminar is a graduate-level class available also to B.Ed. students and providing an opportunity for the study of theories held by
Plato and/or Dewey with important implications for contemporary education.

## 420A Curriculum Planning

A class designed to introduce intending teachers to basic principles of curriculum construction as it relates closely to their professional 420B Alternative Views of the Curriculun

An exploration of the various ways to identify ing the curriculum, its contraction and expansion, and its underlying principles together
with a consideration of structures as ends and means.
421 Applied Linguistics for teachers of French
Introduction to principles of phonetics, morphology, syntax and semantics as they apply to the practical problem of teaching
French in the classroom. Emphasis will be rench in the classroom. Emphasis will be placed on learning and teaching pronunciation,
self-expression, reading and an awareness of language as an expression of culture. This class serves as prerequisite for Ed. 465 C (Methods of Teaching French).

## Engineering and

Engineering-Physics

## Engineering

K. F. Marginson (Chairman)

Associate Professor A. Creelman (N.S. Technical College)

## Assistant Professor

D. M. Lewis
E. N. Patterson

Engineering-Physic Professors
H. W. King
H. W. King

Assistant Professor
Assistant Pro
S. T. Nugent
The profession of engineering is today expanding its scope and changing its pattern of
therefore, that the course of training and education for engineers is adding new classes
and changing the emphasis placed on older topics. More sophisticated mathematics, computer application to the numerical solutions of
very large sized problems, and the use of recent discoveries in science are now playing majo discoveries in science are now playing majo
roles in engineering training while conventiona topics such as drafting and surveying call for less time and effort on the part of the student. Dalhousie's course of study in engineering closely follows this modern trend and, comat the Nova Scotia Technical College, prepares at the Nova Scotia Technical College, prepares
the serious student to play a responsible role in the modern world.
In addition, those students who are keenly interested in the research and development
functions in closer association with physics may functions in closer association with physics may
follow the course leading to the degree of Bachelor of Science in Engineering-Physics at Dalhousie.
The department also offers the first two years of a six-year course in architecture leading the of a six-year course in architect.
Bachelor of Architecture degree.

## Engineering

The work of the Uniform B.Sc. for Engineering covers three years and should follow quite closely the order indicated below. At the end of his studies, the successful student receives a
General B.Sc. from Dalhousie and is qualified for admission to the junior year of the Nov Scotia Technical College. See Notes 1 to 4 below. Students planning to continue their studies at some college other that the Nova Scotia Technical College should consult th

Architecture
Students who plan to study architecture may
take the first two years of the course for the take the first two years of the course for the Uniform B.Sc. for Engineering. Having com-
pleted the course, they will be admitted pleted the course, they will be admitted
without further examination to the Nova Scotia Technical College School of Architecture.

Degree Programme
Uniform B.Sc. for Engineering
Year I

1. Physics 110
2. Mathematics
3. Mathematics 100
4. Chemistry 110
5. Elective

Engineering 001
Engineering 001, An Introduction to Pro fessional Engineering, is a non-credit class, which should be taken by all students. The two
electives must be chosen so as to satisfy the electives must eglations for the General B.Sc. Some students will be permitted to enroll in Engineering 200 in their first year, substituting this class for one of the electives, which would then be taken in the second year.

Year II
rior to sturns should consult the Department prior to registrent
programme.
6. Physics 221
. Mathematics 228
8. Chemistry 230
$9-10$. Engineering 200, 220A, 220B,
Engineering 310
Engineering 310 is a non-credit class which hust be taken by all students. Students eering may take Engineering 210B and Eng neering 2118 in addition to the above classes. Mining or civil engineering students who do not take these classes while at Dalhousie will have College; classes in Surveying at N.S. Technical electives at N.S. Technical College.

Year III
11. Mathematics 328

12-15. Engineering 230, 320, 330A, 330B 340A, 340B
Students planning to specialize in mining engineering are required to take Geology 100 in addition to the above classes. Students planning to specialize in civil engineering may take noology 100 . Civil engineering students who do have to elect a class in Geology at N.S. Technical College; they will thus limit their choice of electives at N.S. Technical College.

## Engineering-Physics

Engineering-Physics or Applied Physics is the tudy of physics oriented towards its applica interdisciplinary and the study is suitable for students whose interests involve experimental work in the physical sciences or who con template research or development work in
industry or resource development. The mathe matical content of the course is similar to that of physics with, however, special emphasis on quantitative solutions. The physics content is dentical with that of honours physics in the first two years, but has special requirements in
the last two years dealing with yystem design, the last two years dealing with system design,
information and control theory, materials science, instrumentation and measurement techniques. The course leads to the degree of Bachelor of Science in Engineering-Physics which has honours standing.
Completion of the course is excellent preparation for industrial research or graduate studies in applied sciences.

Degree Programme

Year
Year I Physics 110
2. Mathematics 100
3. Chemistry 110
4. Elective (Arts)
5. Elective

Year II
6-7. Physics 211 and 231
8. Mathematics 220 or 200
8. Mathematics 220 or 200
9. Mathematics $200-$ level class
10. Elective (Science)

Year IIII
11-12. Ply
11-12. Physics 300, 315
13. Engineering 335
15. Mathematics $300-$-level class 16. Elective (Arts)

Year IV
7. Physics 400
18. One other Physics 400 -level clas 19. Engineering 400 -level class 21. Mathematics 300 -level class
$\qquad$

## Classes Offered

001 An Introduction to Professional Engi ing, lect.: 1 hr r; K. F. Marginson

This class is intended to introduce engineering student to some of the engineerin the profession. It uses the discuss the various formal hranches in ing and the spectrum of engineering fin ing and the spectrum of engineering fu
The student will begin to acquire som skills of his profession; for exam technique of sketching for use in con tion and thought, the creation of simp and mathematical models, and the techncal reports. An attempt is
establish the professional point of vie establish the professional point of view
group discussion of obligations, eth personal relations in the fields of technol endeavour.

200 Graphic S
This class gives extensive coverage instrument of thought - the
pictorial. Students entering the have completed a class in calculus grasp of the basic vector concept. begins with a very rapid coverage of drafting techniques, followed by a descriptive geometry with extensive ceptual design projects and their gra sentation. Graphic solutions to the pr vector algebra are covered parallel analytic work of other classes. T
methods are used in the study of methods are used in the study of calculus, up to and including the so
differential equations and some of differential equations and some of class is concluded with fairly la project done on a team basis by the st
Prerequisitec: Met Prerequisites: Mathematics 100 ; Physic Text: TBA
eying, lect.: 3 hrs.; E. N. Patterson, ss is an introduction to the fundaof surveying. Topics covered include of land measurement, precise level. it, stadia and plane table surveys,
computations, $\begin{aligned} & \text { adjustments and }\end{aligned}$ of results, the determination of azimuth and latitude based on bservations, construction surveyin ts, curves. Bouchard and Moffitt, ey Field Camp, E. N. Patterson.
ey field camp will normally be held tely following the final examinations in ig and will be of three weeks' duration,
of surveying instruments and equipof surveying instruments and equip-
be practiced by all students. Assigned will include the use of hand levels, es, dumpy, tilting and automatic levels, and theodolites. Traverse computation performed by hand as well as by digital er methods.
Engineering 210B

## me as in Engineering 210B

Engineering Mechanics - Statics, lect.: 2
$s$ is an introduction to the study of ing mechanics. Following a presentaing mechanics. Following a presenta
basic concepts, a brief treatment of algebra will be given. The student will sudy the equivalence, resultant and
ium of force systems acting on a or on idealized rigid bodies such frames and machines.
ss material will correspond closely to scribed in the text.
isite: Mathematics 100
172-73) Meriam, Statics.
Kinematics, lect:: 2 hrs.; lab.: 3 hrs.; F
taking this class should have taken calculus and should be proficient at with rates of change. A firm grasp of $r$ concept is desirable.
ss will cover the motion of particles, rigid bodies. Displacements, velocities, second degree accelerations will be graphically and analytically
cations of the theory will be made to the of various types of mechanism, and the he computer in kinematic analysis and will be considered.
sites: Physics 100; Mathematics 100.
1972-73) Huang, Engineering Mechanics
roduction to Electrical Engineering,
rrs.; lab.: 3 hrs.; A. Creelm an.

is an introduction to electrical

engineering. However, it is also a terminal class in this subject for certain engineering dislinear . considerable emphasis is placed unon detail, a devices and systems. The laboratory periods illustrate the use of electrical measuring devices and introduces the student to conventional methods of testing electronic and electro mechanical equipment.
Prerequisite: Mathematics 100; Physics 110; Engineering 310 (taken concurrently).
ext: (1972-73) Del Toro, Electrical Engineer ing Fundamentals.

310 Engineering Problems by Computer Methods, 1 afternoon per week, D. M. Lewis/E. N. Patterson.

This is a class which will prepare the student to own Fortran IV digital computer blems. It will cone solution of engineering proof actual engineering problems which each student will execute on the CDC 6400 computer. Results will be submitted to the into use some of the standard application programs which are available, such as COGO and ECAP.
Prerequisites: Registration in second-year engineering, or consent of instructor
Text: (1972-73) Murrill \& Smith, Fortran IV

320 Dynamics of Particles and Rigid Bodi
lect.: 2 hrs.; occasional tutorial, D. M. Lewis
This class completes the study of engineering mechanics begun in Engineering 220A and 220B. The first term will deal with kinematics and dynamics of single particles and in the to rigid bodies. o rigid bodies.
. Mathematics 100; Engineering $220 \mathrm{~A}, 220 \mathrm{~B}$; Engineering 310.
rext: (1972-73) Huang, Engineering Mechanics
Volume 2.

330A Materials Science, lect.: 3 hrs.; lab.: hrs.; H. W. King
The aim of this class is to give engineering structure in determining the useful properties of materials. The relevant properties are mechanical, thermal, electrical and environmental. The approach will be to first describe discuss the significance of structure. Elastic properties are shown to be influenced by the nature of the chemical bonds and the plastic properties by the crystal structure and the presence of defects. This approach is continued
in the study of fracture, hardening mechanisms fatigue, creep and viscolastic behaviour, covering metals, plastics and composite materials, and is continued in the sections concerning thermal, electrical and chemical concerring
properties.

The laboratory consists of a series of demonstrations of the dependance of properties on structure or microstructure and includes time set aside for students to prepare an individual
project on an aspect of materials science project on an aspect of materials science
applicable to the particular branch of engineering in which they intend to specialize in the future.
Texts: Hanks, Materials Engineering Science, (Harcourt, Brace \& World 1970), Gordon, New Science of Strong Materials, (Penguin Books, 1968).

330B Strength of Materials, lect.: 3 hrs.; labtutorial 3 hrs.; D. M. Lewis.
This class is an introduction to the study of the stresses, strains, and deformation of a solid
body which results when static forces are applied to the body. Topics discussed include: the definition and transformation relation of stress and strain; torsion of circular sections, stresses and deflection of beams; column action.
Prerequis Text: Mext: ( (1972-73) Higdon, Ohlsen, Stiles, Weese, 335 Electronics, lect.: 3 hrs.; A. Levin.
This class covers advanced circuit analysis of linear and non linear systems, the physics and concepts of information and noise and transmission lines and filters. The following topics are treated: network reduction, the 4 terminal network and solutions by matrix methods, non linear systems, modula rectification; carrier transport in semiconductors, properties of diodes and transistors; electro-mechanical analogues and analogue computation methods, feed-back and control systems, stability criteria, nature of information and noise, properties of distributed constant lines and filters.
220 , which may be taken concurmatics 200 or Text: Milman and Halkias, Electronic Devices and Circuits.
340A Classical Thermodynamics, lect.: 3 hrs tutorial/lab.: 3 hrs.; K. F. Marginson.

This class covers the theoretical portion of classical engineering thermodynamics. Calculus oo the level of partial differential equations is open and closed systems, reversibility, enthalpy; second law, entropy, availability and efficiency, psychrometrics. Various real pro-
cesses and thermodynamic devices will be cesses and thermodynamic devices will be
discussed. This work covers applications other than those involving chemical reactions. Prerequisites: Mathematics 100; Physics 110; Chemistry 230 (may be taken concurrently). Text: (1970-71) Van Wylen, Thermodynamics.

340B An Introduction to Fluid Mechanics,

Fluid mechanics is the engineering science upon which such specialties as aerodynamics, gas
dynamics, rate processes, hydraulic and marine dynamics, rate processes, hydraulic and marine kinematics, and dynamics of fluids.

As this is an introductory class, considerable time will be devoted to the study of fluid properties, fluid statics and the underlying concepts, definitions and basic equations of
fluid dynamics. Laboratory experiments will be fluid dynamics. Laboratory experiments will be
carried out to investigate some of these basic aspects.
Prerequisites: Concurrent registration in Engineering 320, or the consent of the instructo
Text: (1972-73) Streeter, Fluid Mechanics

400 Advanced Physics Laboratory, lab.: 6 hrs.; A. Levin, S. T. Nugent

This is a physics and engineering-physics laboratory class in which students in groups of
two work largely on their own initititive. The experimental work covers nuclear disintegration, gamma and beta spectroscopy and absorption measurements; proton spin quantitative measurements and Planck's constant determination; thermonic emission and ionization ex-
periments using a vacuum pumping and inperiments using a vacuum pumping and in-
strumentation system; properties of solid state semiconductors and devices; experiments on
the spectral noise distribution of transistors and the spectral noise distribution of transistors and
the use of analysis systems; experiments with a the use of analysis systems; experiments with a
Helium-Neon laser, holography etc. Helium-Neon laser, holography, et

Experiments in other areas, such as acoustics, optics and fluid dynamics, are available if requested. A report upon a topic to be agreed
with the instructor is required as part of this class.

416 Mathematical. S. T. Nugent.
Topics discussed include: ordinary differential equations, complex variables, integral trans-
forms, special functions, partial differential forms, special functions, partial differentia'
equations, eigenfunctions, eigenvalues, Green's functions, perturbation theory, integral equations, calculus of variations and tensor analysis. Prerequisite: Registration requires prior departmental consent.
Texts: Arfken, Physicists (2nd ed.), Matthews and Walker, Mathematical Methods of Physics (2nd ed.).

420 Communication and Control Theory, lect 3 hrs.; S. T. Nugent.

In the first term the class is introduced to the principles of communication theory. Topics discu ssed include: the time and frequency domain, random signal heory, network analysis In the second term the class is introduced to
the field of optimal control. Topics discussed include: statistical design of linear systems,
state representation of systems, calculus of
rogrammin

## .

433B
King.
The physical pr re discussed in terms of engineering materials and microstructure, using the principles of modern physics as a basis. The properties are first formulated systematically in tensor notation and shown to possess an intrinsic ymmetry which must be related to the crystal symmetry of the material. Many useful pro perties, such as electron transport and plastic
deformation, are shown to be strongly dependent on defects in the crystal structure. Th nature of such defects, and the methods available for their creation, control or elimina ion, are considered in relation to the optimiza tion of these properties. This approach is arther extended in a discussion of the effects crystalline and polyphase materials.
rerequisite: 4th year standing and permission of instructor
Texts: Nye, Physical Properties of Crystals Baird Physiv. Press, 1969); Hutchinson 1968).

35A Semiconductors, lect.: 3 hrs.; A. Levin
Properties of intrinsic and doped semicon uctors; carrier generation and transport, Hal effects and Shockley Haynes experiment; sem onductor diodes, fields and carrier densities transport equations; special diodes; transien
behaviour in diodes; bipolar transistors, pro perties, limitations and failure mechanisms; the F.E.T., unijunctions, multilayer diodes, tunne diodes, and thermistors; noise mechanisms solid state device

English Language and Literature
rofessor Emeritus
C. L. Bennet

Professors
J. Gray (Chairman)
M. G. Parks
M. M. Ross
M. M. Ross
D. P. Varma (Sabbatical leave 1974)

Associate Profess
S. A. Cowan
R. MacG. Dawson (Sabbatical leave 1973/74)
J. Fraser
A. J. Hartley
S. Mendel
A. N. Rasp
A. N. Raspa
H. P. Sucksmith
H. S. Whittier

The study of English literature at Dall not just the study of the literature of E , To be sure, it is largely concerned with $\mathrm{E}_{\mathrm{g}}$ ge written heritage of the British Isles, but writing in their shores to include the writing in Canada, the United States, the English-speaking Commonwealt
indeed, some European indeed,
tion.

## It ranges widely in time, too, from early And

 Saxon works of the eighth century hirteen centuries of changing id anguage to the still-changing thoughts, and expression of the 1960 s and 70 s . Thforms that the written word may take fiction, drama, essay, history only for an understanding of the evolution that brings them to be what the but also for an understanding of that emporary and that which is more end that they embod

Indeed, the purpose of English stud Dalhousie, briefly stated, is the enjoym understanding of the written word. Si
word is the principal link between word is the principal link between
dividual heart and mind and the rest world, such studies naturally touch philosophy, politics, religion and the fine well. At the same time, the student is encouraged to think, and to use langua clarity, judgment and imagination.

In more detail, the goals of English stu to perceive that reading is a source of $p$
knowledge and wisdom, to sharpen the of discrimination between what is good a in literature and ideas, to gain some standing of the process by which great w his own best expression.

In the first year, English 100 is required sudents who wish to take further classes. There are twenty different ranging from historical surveys to mos
cialized studies of periods or themes. To students to choose the one most suited nclinations and needs the English Dep and the Registrar's Office have an Engl supplement which includes the ain
reading lists of each section. Only und
tances is exemption from 100 granted
numbered from 200-228 are especially for students who are concentrating in studying it as a complement to their 250 are designed as studies of speareas for Honours students. Honours are open to General students with the ron

## Advisors

as possible in the academic year, each
who intends to concentrate on English a Faculty Advisor who will aid in the ment of a programme to suit individual s. All students interested in the study of glish language and literature should
he Department of this interest in order Advisor may be assigned

Degree Programmes
neral B.A. in English
ts should consult with their Faculty about their choice of classes. The nent expects General students to form t programmes of four to eight classes in
above English 100 . Students should the cl
the classes beyond English 100 required stitute a programme in English for the B.A. degree, not more than three should wn flasses:
of classes: $214,218,224$
5, 206, 208, 215, 216
9, 210, 212, 213, 217
ses numbered from 201-228 (excepting $206,207,218$ ) are not accepted as
tion for Graduate Studies in English who may desire to change to an Programme or continue in Graduate should arrange with their Advisor to several Honours classes before two-year M.A. course on completion of eal B.A. degree, but only if the student mpleted four or five Honours rather than
classes for his concentration and has classes for his concentration and has
at least a second-division average in
with me)

Honours in English (Majo Honours
course in Enel dy of the subject which acquants th with the major writers and trends from al times to our century. It is therefore diar relevance to the student who is a libera detailed study of English as a a liberal education, to the prospective
ool teacher of English who needs Chensive understanding of the subject the student intending to proceed to the estudy of English and to complete in the requirements for the M.A. degree
intending to enter the Honours course
in Year II must consult the Department in advance to plan their course and be formally
enrolled. In subsequent years, Honours students are encouraged to seek the advice of the are encouraged to seek the
Department in choice of classes.

The Honours course consists of nine classes (in addition to English 250A) beyond the English 100. At least one class must be taken from each of the following six sections:
Section A. English 252 (recommended fo third year)
Section B. English 253: English 351
Section C. English 251; English 352
Section D. English 254; English 356
Section E. English 354; English 452; English Section F. English 453; English 455

The student may choose his three remaining classes from those not already chosen in Section G. English 201, 206, 207, 218, 454
English 250A (Bibliography), a non-credit class which meets one hour per week in the first term, is required of all Honours students and is to be taken in the first year of the Honours course.
The Honours student must meet the require ments for the General B.A. degree. He is advised to select a minor from one of the $B$ in the "Degrees and Courses" section of the B in the
Calendar.
B.A. with Combined Honours
grammes:
English and French
English and French
English and History
English and Philosoph
English and Spanish
English and Theatre
Students interested in any of these combina fions should consult with the Departments concerned. If a student wishes to combine ed above, he should see the Chairman of the Department as soon as possible.

A Joint Honours programme, involving cooperation between the Departments of English at Mount Saint Vincent and Dalhousie, has
been established. Students interested in this programme are advised to consult the Chairman of the Department for further details.

## Classes Offered

100 Introduction to Literature, lect.: 3 hrs . Members of the Department.

Since English 100 consists of sections taught by many different instructors, statements about its
generalizations. All instructors of English 100 have these two broad objectives in common:
(a) to involve the student in the serious study of literature as a crucial part of education; (b) to involve him in the discipline of words so
that he will be a more critical reader and a more exact and imaginative writer.

The subject matter varies from section section. Detailed syllabi of all sections are available. Practice in writing is carrie

Each section attends three lectures per week. In addition, the tutors attached to each section conduct small discussion groups and personal interviews with students.

## Classes for General Degree

201 The English Language, lect:: 2 hrs.; H. E. This class provides an introduction to the scientific analysis of language and a survey of
the historical development of English. Attention is paid to modern theories concerning the structure of English, to the concepts of "style"
and "usage", and to the relevance of linguistic and "usage", and to the relevance of linguistic
research to literary criticism and language researeng. Attention is also paid to the "ancestry" and evolution of the language, with the sources of its vocabulary and the ways in which the sounds, forms, syntax and very meaning of words in English have changed over the centuries being studied through selected literary Prepara Preparatory reading: C. Laird, The Miracle of
Language (Fawcett); W. L. Anderson and N.C Sanguage (Fawcett), W. L. Anderson and N.C. 3rd edition (Holt, Rinehart and Winston, 1970). This class is not prerequisite to, but is useful as
an introduction to, English 253 and 351 (Old and Middle English).
203. Masterpeices of Western Literature, lect.. hrs.; H. Whittier
This class is intended to provide the student with the opportunity to do intensive reading of major works from Western literatue The selections vary from year to year. 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 comonly stimulating in themselves but also com-
prise the basis for the development of English and other literatures.
Generally, works will be taken up in chronological order. As the class proceeds, interrelationships and comparisons of theme, form
and artistic perspectives in the various works will be developed. Classes generally consist of a combination of lecture and discussion. Voluntary tutorials are held once a week for open

204 Th
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
approach and the character of tests and approach and the character of tests and
examinations are such as to render it necessary for the student to attend most of the lectures. Since a considerable amount of attention is
paid to the philosophical ideas which bulk large paid to the philosophical ideas which bulk large in many of the novels studied, students who are taking (or have taken) Philosophy
strongly advised not to take this class.

205 Victorian Literature (not offered in 1973/74).
206 American Literature of the Nineteenth Century, lect.: 2 hrs.; S. Cowan.

This class is a survey of American literature through representative works by major Ameri can writers from 1800 to 1900. Some of the writers studied are Cooper, Hawthorne, Poe,
Emerson, Melville, Whitman, Dickinson, and Twain. The student will write one long paper or Twain. The student will write one long paper or
several short ones each term, and there is an examination in the Spring. Students may be required to present reports to the class.
207 Canadian Literature, lect.: 2 hrs.; M. Parks, H. Sproule.

This class is a survey of English-Canadian literature with emphasis on poetry and fiction from the 1920 so the present. Some knowledge of nineteenth-century British literature, though not essential, is very useful to the
student of Canadian Literature. A few representative writers of the nineteenth century (Haliburton, Richardson, DeMille (prose) Howe, Goldsmith, Isabella Crawford, Carman, Roberts, Lampman, D. C. Scott (poetry)) are studied briefly in the first term, and essay
topics are set on nineteenth-century writing topics are set on nineteenth-century writing
Twentieth-century novels and poetry are studied in the last month of the first term and throughout the second term. The following authors will be included: Leacock, Grove, MacLennan, Callaghan, Davies, Raddall, M. Smith, F. R. Scott, Klein, Birney, Layton (poetry).

208 The English Novel to 1900, lect.: 2 hrs.; A R. Bevan.

This class will follow chronologically the development of the English novel from the early eighteenth century to the end of the nineteenth century. The novels to be discussed are chosen
from a long list of works that have withstood from a long list

209 Twentieth-Century Fiction, lect.: 2 hrs.; A N. Raspa, H. Whittier.

English 209 is intended as an introduction to the main thematic and technical trends in th
ectures focus on representative novels of some nd on significant novels of the past two decades.
210 Modern Poetry in English (not offered in 1973/74).

12 British Literature of the Twentieth Century, lect.: 2 hrs.; N. S. Poburko.

This class is an approach to the reading of wentieth century British poetry, prose and drama. Central themes of this period are viewed
through a study of the works of selected authors. The writers considered in 1973-74 will be: D. H. Lawrence, T. S. Eliot, James Joyce,
G. B. Shaw, Graham Greene, W. H. Auden, G. B. Shaw, Graham Greene, W. H. Auden Samuel Beckett and Doris Lessing
13 American Literature of the Twentiet Century, léct.: 2 hrs.; R. Hafter.
The reading list for this class is fairly extensiv and includes plays, short stories, poetry, and
ovels, with emphasis on the last-named Classes will be conducted by lectures and discussions. There are no examinations, but brief questionnaires may be given to kee
students honest in fulfilling reading require ments. In addition, there will be a first-term paper and a final paper which will involve outside reading. In computing grades, great stress will will be placed on the ability to writ respect are advised to avoid this class.

214 Shakespeare, lect.: 2 hrs.; C. Myers/S. E. Sprott/G. Harvey/G. Waller.

This class is designed for students in the General course who wish to study selected imply 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.: hrs.; G. Harvey.
This class concentrates on some major works of ordsworth, Coleridge, Byron, Keats, an Shelley. During the first term some attentio will be given to representative poems of the pre-Romantics in the course of an introduction to the Romantic movement

216 The Gothic Novel, lect.: 2 hrs.; D. P. Varma.

This class will survey the origins and development of The Tale of Terror and Supernatura during the later half of the eighteenth century and its various manifestations and influences in
succeeding fiction. Not only the chief landmarks of the gothic fiction will be charted, but the students will also explore the various chambers of horror-literature. There will be no final examination, but students will work on assigned tests and participate in discussions.

## 217 Af

 Smith.
## English 217 is a class on Africa

 written in English. Novels, plays, andwill be discussed. The bulk of the be by Southern African and West writers. Works to be studied will $m$ modern, and will reflect the attitudes of and African nationalism.

218 Medieval Literature (not off 1973/74).

## 220 English Drama (not offered in 1973

222 English Satire (not offered in 19 see English 227).
224 Renaissance Poetry (not 193/44)
225 Epic Poetry and Prose (not oft 226 Tragedy (not offered in 1973/74). 227 Comedy and Satire, lect.: 2 hrs.; , The comedian and the satirist are inter and eccentricities of human nature. Th will concern itself with their points of expressed in such varied forms as stage
graphic satire, the comic novel graphic satire, the comic novel,
humorous essay. It will also consider th comedy and laughter in their applic literary types, including situational, satiric, sentimental and domestic con well as rollicking farce, slapstick, comedy and the absurd. Wherever mented by play readings, films and illustrative materials.
Prerequisite: English 100 and an sense of humour.
228 Lyrical Poetry (not offered in 1973

## Classes for the Honours Degree

## 250A Bibliography, lect.: 1 hr.; (fis

 only), R. L. RaymondThis class is a departmental (i.e., non-and non-credit) technical class for hon graduate students. It is planned to acqu
student with certain research tools student with certain research too students of English (bibliographies, ca indices, digests, journals, dictionaries, films), many of which the student is un class also includes instruction in the aspects of writing papers (planning, methods, footnotes, bibliographies), a

352 Seventeenth-Century Non-Dramatic Literaure, lect.: 2 hrs.; S. Cowan.

Forster, Passage to India (Penguin); Orwell, $A$ Collection of Essays (Anchor); Beckett, Endgames Pinter, The Birthday Party; Cary, The Horse's Mouth (Penguin); Durrell, Justine,
Murdoch, Under the Net. Interspersed with these, selections from the following poets will be discussed: Pound Eliot, Yeats, Hopkins, Auden, Dylan Thomas, Hardy, Graves, Gunn, Hughes, and one or two younger ones. The editions indicated are the ones that the book store will be carrying.

454 Literary Criticism, lect. 2 hrs. N. Poburko.

This class is primarily for fourth year honours students. It deals with varieties of modern criticism since Matthew Arnold. The authors to A. Richards, Edmund Wilson, and such European critics as Barthes, Goldmann and Lukacs.

455 Modern American Literature, lect: 2 hrs M. Klug.

This class will study the growth of American literature over the past seventy years. The first term will be devoted to poetry and will centre on readings from Frost, Eliot, Lindsay, Stevens,
Williams, Crane, Lowell, and Roethke Through the second term we will be working with fiction: Dreiser's Sister Carrie, Fitzgerald's Great Gatsby, Hemingway's The Sun also Rises, Faulkner's Light in August, Ellison's Invisible Man, Bellow's Adventures of Augie March, and Mailer's American Dream. The classroom work
will involve lecture and discussion. Each wilm involve lecture and discussion. Each fall and spring term on a topic of his own choice. A final examination on the year's reading will be set.

457 Victorian Literature, lect.: 2 hrs.; M. Ross. A study of the major Victorian poets and prose writers (other than novelists). Attention will be
given to the changing philosopical, scientific and social pressures of the period The main emphasis of the class will be on the poetry of Tennyson, Arnold and Browning and the prose of Carlyle, Ruskin, Newman, Arnold and Pater.

## Changes and Additions

As the Calendar goes to press before all plans for the next academic year are completed, there may be significant changes in the classes listed above. Students should consult the Department or the Associate Registrar for revised class and
text lists.

## Graduate Studies

The Department offers graduate classes leading to the degrees of M.A. and Ph.D. Details elating to admission, scholarships and fellowships, requirements for the degree, classes of nstruction, etc., can be found in the Calend of the Faculty of Graduate Studies.

French
Professors
Professors
H. F. Aiken
p.
P. Chavy

Associate Professor
D. W. Lawrence

## Assistant Professors

W. Ajami
E. Boyd
T. . E. Garter
B.
W. T. Gordon
S. Journoud
R. Kocourek
F. A. Kretschmer
H. R. Runte
M. Sandhu
C. J. Simon

## M. Bishop

J. W. Brown
J. P. Gaillard de Semainville
R. Ginsberg
K. Haberl
K. Haberl
M. Leal
E. Messinger
R. Runte

Lecturer (part-time)
H. E. Bednarski

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 certain careers (teaching, translating, etc.), or
serving the cause of Canadian unity. The Department offers an excellent opportunity for pursuing such study to those whose interest is strong enough to make them willing to devote 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 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. Students in our major honours programme are normally expected to spend at least one summer in a place where French is the language of communication.
Some students wish or are required only to gain
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
rench studies, you should consider the possi- (b) spend at least one summer in a bility 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 o concentration in a General Bachelor's degree course, are encouraged to discuss the matter at any time (but the earlier the better) with
member of the Department. An Honours degree is usually required for or facilitates access to graduate studies.

## French Degree Programmes

## General Bachelor's Degree

With French as the main area of concentratio the course may be arranged in two ways:
Programme under Old Regulations
First Year
Either (A) 102 or 134
$O R$ (B) 102/202 combined.
Second Year
Either (A) (If programme A has been followed in the First Year),

Year), 202 or 204 and one or more
Or (B) (If programme B has been followed in the First Year), two or more of 230, 231, 232 and 304 .
Note 202 is the normal continuation of 102 , while 204 continues 134 . The combined class Classes 202 and 204 are mutually exclusive.

## Third Year

Up to five of $230,231,232,304,310,312$, $321,322,330,331,340,350$ (A and B).

## Programme under New Regulations

See Pramme Planning Guide.
Note The following courses may not be
counted toward counte
206.

Bachelor of Arts with Honours in French A decision regarding admissibility to Honou not usually made until the end of the student's second 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 students may like to opt at this point for either a language or a literature bias to their studies. Honours standing may be granted to courses
taken at the 200 level if the grade awarded (minimum grade B-) is sufficiently high.

Students in the Honours programme with French as main subject are normally required before graduation to (a) Either: write an Honours essay under the an area connected with the programme. $O_{r}$ : write a comprehensive examination
speaking community to consolidate the ledge of the language.
Bachelor of Arts with Combined French and Another Subject (as early as possible) with the concerned. Students planning a Honours course should consider, ho the number of classes taken in eithe might be insuffieient for admission raduate programmes without at leas year's work.

Notes
(1) Combinations of classes other than set forth above should not be chosen degree requirements without the exp proval of the Department.
(2) A student may, with the permissio Department, be admitted to a French c an advanced point because of prior kn (except as he may be granted transt, the usual way), must normally take tr the usual way, must normally take
total number of classes as other studen same course.
(3) A student admitted to a French an advanced level who obtains credit at that level, may not later take a Fre
at a lower level for credit except express permission of the Department.
(4) No more than two classes in Fren taken for credit at the 100 level.
(5) Enquiries concerning prescribed tex
should be made at the end of the preced academic year.

French Classes Offered
100 French and French-Canadian Literature in English Translation (20th century), le per week.
Not for credit towards a degree in F is a class with limited enrolment design as an introduction to French and
Canadian Literature for non-specialists.

100 Comparative Literature, (See Co Literature Section).
102 Spoken and Written French, language lab.: $2-5$ hrs. per week.

This is an intensive course designed who wish to achieve proficiency in sp written French, either for general p as a preparation for further study
language and literature. There w language and literature. There
emphasis on oral proficiency. emphasis on oral proficiency.
will have studied French in high sch have had limited experience in language. Students who have not studied the language are admissi studied the language are
sections (limited to fifteen students)
kly. These lecture periods are directly individual practice in the language ry. Students may choose when they tory .r in the language laboratory. There mit on time to be spent in these sessions is minimum of from two to five houred normal. Students inter this course should complete a special ilable from the Admissions Office.

French 102, while a full credit course, he first half of an integrated two-yea ne, the more advanced portion bein 202. French 102 and French 202 may explained in the special form are $\exp$
to above.
ciency in Reading, lect.: 3 hrs.
dents wishing to acquire or improve comprehending written French, with ensive training in the spoken language or active use of the written language
designed primarily for undergradu class can also accommodate and meet of graduate students required to show of a basic reading knowledge o
and Spoken French, lect.: 3 hr
is designed for students who wish proficiency in spoken and written It differs from French 102 in that there iph and an introduction to literature
held three times weekly. There is no laboratory practice in connection with rrse. Using a basic text (Reflex French), ations and illustrating correct usage. A these basics should lead to simple
and written exercises. By the end
st term, the student should have
to dialogue, play scripts and free to dialogue, play scripts and fre
n. The primary text is then supple ion. The primary text is then supple-
with two simple novels to build y, reinforce the student's knowledge ing structure and serve as a basis for term in class. Toward the end of the term students are expected to be
of writing paragraphs or short essays of nriting paragraphs or short essays of nature. Students will be assessed on
itten exercises, participation in class al test at the end of each term.
ken and Written French, intensive,
t.: 3 hrs.; language lab.: $2-4 \mathrm{hrs}$. per
and completes the basic work begu C 102.
rench 102 or equivalent.
ch 102 and 202 may be taken in th
see note following French 102.

Pa Boken and Written French, intensive, required.
Sections will be devoted to subject material in which students express a particular interest. In some cases, the subject material may be studied hroughout the whole semester (stylistic basic material learned in French 102 and 202A; critical reading of a literary work with elementary essay writing); in other cases, a number of
shorter options, each one lasting approximately two weeks, may be offered during the semester (letter writing, French-Canadian speech, the language of specialized activities such as the felephone, photography, sports, games, etc.). Details will be available by registration time.

204 Composition, lect.: 3 hrs. per week.

Training towards accuracy in reading and writing French. Exercises in translation from French to English and from English to French, grammar,
position.

206 Proficiency in Reading, lect.: 3 hrs .
For students wishing to increase their skills in the comprehension of French texts. Suitable linguistic level, including those who have taken French 106.

230 Introduction to French Literature, lect.: 3 hrs. per week.
Study of "le conte" in French and FrenchCanadian literature from the 18th to the 20th century.
231 Introduction to French Literature, lect.: 3 hrs.

French and French-Canadian theatre in the
232 Seventeenth Century Literature, lect.:
hrs. per week.
hrs. per week.
This class will deal with the theme of love and its treatment in 17 th century French literature.

304 Composition, 3 hrs. per week.
Continues the language work of 204 at a higher level.
week.
Practical exercises in liter explication de texte". The texts selected will Passages from earlier authors may be used in modernized versions.

312 Civilization of France and French Canada, lect.: 3 hrs. per week.

This class will consider French and FrenchCanadian civilization in a variety of ways and will not be concerned exclusively with litera-
ture, although a number of texts will be ture, although a number of texts will be

## 321 General Phonetics, lect.: 3 hr

Study of the sounds of language, especially those of English and other languages of particular interest to students; how these
sounds may be ber perceived and produced; how they practice in the use of phonetic script; introduc tion to phonemics. Not a class in pronounciation. Language lab work may be required for some exercises. Prerequisite: Good knowledge of spoken Eng-
lish and familiarity with the spoken form of at least one other language.

## 322 Introduction to Linguistics

Study of the nature of language: elements of phonetics and phonology; writing; grammar
(units, categories, functions); word and ment (units, categories, functions); words and mean-
ing (lexicon, semantics); summary of historical, ing (lexicon, semantics), stummary of historical,
comparative and contrastive linguistics; survey of major world languages; chief events in the history of linguistics. In view of the essential role of language in human life, this class is suitable for inclusion in various study pro grammes.

330 French Literature of the 17th and 18th centuries lect.: 3 hrs . per week
331 French Literature of the 19th century, lect.: 3 hrs. per week.

340 Introduction of French-Canadian Litera-
350A Introduction to Medieval French Literature, lect.: 3 hrs. per week.

350B Introduction to 16th Century French Literature, lect.: 3 hrs. per week.
404 Composition, lect.: 3 hrs. per week.
Continues the work of 304 at a higher level. Prerequisite: French 304
423 Evolution of Linguistics, lect.: 3 hrs .
The development of language study from early times to the present day. Special attention will be paid to the linguistic ideas of the twentieth century.
430A/B Medieval French Literature, lect.: hrs. per week.

431A/B Sixteenth Century French Literature lect.: 3 hrs . per week.
$432 \mathrm{~A} / \mathrm{B}$ Literature of the 17 th Century, lect.: hrs. per week.

433A/B Literature of the 18th Century, lect.: 3 hrs. per week.
$434 \mathrm{~A} / \mathrm{B}$ Literature of the 19th Century, lect.: 3 hrs. per week.

435A/B Literature of the 20th Century, lect.: 3 hrs. per week.

## Geology

## Professors

H. B. S. Cooke (Carnegie Professo
M. J. Keen
G. . Milligan

Associate Professors
J. M. Ade-Hall
F. Aumento (Chairman)
F. Medioli
P. E. Schenk

Assistant Professors
D. B. Clarke
G. K. Muecke
G. K. Muecke
D. J. W. Piper
M. Zentilli

Research Associates (Primary appointments
elsewhere)
L. H. King
B. D. Loncarevic
J. P. Nowlan

Post Doctoral Fellows
S. Barr (Oceanography)
K. Kitazawa

Did you know that eastern Canada was covered Did you know that eastern Canada was covered
by sheets of ice a few thousand years ago? Do you worry that this ice will return? Can you oil is discovered in commercial quantities offshore? Or the even greater impact if uranium is found within one of the poorer countries of the world. Did you know that the Atlantic
Ocean may have been barely big enough to Ocean may have been barely big enough to
bathe in three hundred million years ago? And at that time the equator passed through Nova Scotia, with the day then only twenty hours long? Geology deals with problems such as these. It is the study of the earth and planets their present nature and their development in time.
eology can be pursued by people with many re only thests. ©olcanoes are spectacular sut within the surface expression of rock metted cause great loss of life - can their occurrence predicted? Earthquakes and nuclear explosion have told us much of what we know about the inside of the earth. Evolution which has led to Man is shown by animal and plant remains now found in rocks as fossils. What atmosphere did these beasts breath? How salty was the sea at he time they lived? How was the salt
old beaches, former shore-lines, are found now ar above present sea-level around Hudson Bay and Newfoundland. Can a geologist describe conditions at the surface of the earth at any time in the past? Or the temperature inside the
earth at these same times? Or even now? How o mountains form? Perhaps the Himalayas ose when India and Russia collided. Perhaps the Rockey Mountains are the crumpled leading dge of our continent sailing, as it were, across he Pacific Ocean. Our means of subsistence, food, raw-materials, and energy required for a
growing population must be obtained from the outermost rim of the earth. It is one task of the geologist to find these resources.

Classes in geology are offered for differen types of students. Some will want to make a career in some aspect of the study of the earth -
as geologists, geochemists, geophysicists, geologists, geochemists, geophysicists,
oceanographers or teachers. Some may need instruction in geology as an aid to other disciplines; for example, a mining engineer; or a physicist interested in X -ray diffraction spectrolography; or a biologist interested in prystal 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 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 frovided by industry, primarily in the search metals, petroleum and water. Geologists compe ent in mathematics, or indeed mathematician with some background in geology, might be involved in processing and analysing data using digital computers; those interested in going to
sea might work with the Federal Governg to marine institutions. The federal and provincia
government employ geologists in logical surveys and Departments of Mine $\begin{array}{ll}\text { Canadian } & \text { government is responsible } \\ \text { supplying } \\ \text { geologists to agencies }\end{array}$ supplying geologists to agencies
UNESCO to work tries A graduate with ander-develope tries. A graduate with a geology degre
reasonable background in other scien find teaching in high school challenging

## High School Preparation

Students in high schools who plan a
sciences involving the earth sciences involving the earth, such as ge to have the following subjects in Grsibl to have
XII:

Grade XII mathematics, plus two of Ci Phy and Biology. (The third sho been taken in Grade XI if possible).

Note that these are not prerequisites, b strongly advise them. The student shoul or make deficiencies in his or he housie. Note thation in the first year Geology is not counted as asent G Geology 100 level class in Geolog housie.

> Degree Programmes

The tables on the pages that follow are suide, and are not rigid requiremens student who wishes a different combin members, and in particular the Chairm ask for advice. A wide range of ch possible. A student who intends to degree in Geology, or is even considering so, should consult the Chairman as effort to seek such advice prior to regi for the first time. All students maji geology must consult with the Chairman Department prior to registration for the year.
Student's who intend to make their ca Geology, or intend to pursue graduate and, if consider taking an hotours pro Geology in the first year.

All students who expect to gradu honours in Geology in or after 19 in their programmes.

Programme for General Students majoring in Geology

## Geology 100 <br> Chemistry 110 or Physics 110 <br> Math 100

Two classes chosen from two non-science groups.

Two classes from Chemistry, Physics, Biology, or Mathematics.
One elective.
Geology 301 and two other 300 -level classes in Geology.
One elective and one class in Biology, Chemistry, Physics or Mathematics.
By the end of the second year the student should have completed at least one class in each of: Mathematics, Chemistry, and Physics. If possible two hese classes should be included in the first year).
at, in addition to the Geology classes, as suggested here, at least one other 200 -level class must be included in the programme to fulfill the faculty regulations).
only one class in Biology is taken, Biology 3321 is relevant to Geology students and may be taken by them with no prerequisites.
two 200 level Physics classes can be taken, Physics 221 and 230 are sensible choices.
emistry 210 is a sensible second class in Chemistry.
Tathematics 200,220 , or 228 are all sensible second classes in Mathematics - but note any restrictions there may be on 220 or 228 as quisites, if further classes in Mathematics are planned.
hough the genera sererely handicapped if he has not taken at least matics or a foreign language, students should note (a) that any one planning a yin a foreign language
Any student who is not sure of a suitable programme plan is invited to consult with the Chairman of the Department.

|  | $\begin{gathered} \text { I } \\ \text { Economic Geology } \end{gathered}$ | $\begin{gathered} \text { II } \\ \text { Geophysics } \end{gathered}$ | $\underset{\text { Geochemistry }}{\text { III }}$ | $\begin{gathered} \text { IV } \\ \text { Petrology } \end{gathered}$ | $\underset{\text { Stratigraphy }}{\text { V }}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Ye: 1 | Geology 100 <br> Mathematics 100 <br> Two classes chosen from Languages, Humanities or Social Sciences |  |  |  |  |
|  | Chem. 100 | Physics 110 | Chem. 110 | Chem. 110 | Biology 101 |
| Year II | Geology 201 <br> Geology 202 <br> Engineering 210 and 211 <br> Math 200 or <br> 220 or 228 <br> Physics 110 <br> Elective | Geology 201 <br> Geology 202 <br> Physics 230 <br> Math 200, 220 <br> or 228 <br> Chem. 110 | Geology 201 <br> Geology 202 <br> Chem. 210 or 230 <br> Physics 110 or <br> Math 200 or 2065A <br> and 2075B, or <br> 227 , or 228 <br> Elective | Geology 201 <br> Geology 202 <br> Chem. 210 or 230 <br> Physics 110 <br> Elective | Geology 201 <br> Geology 202 <br> Biology 2000, or 2040A <br> and 2060B <br> Chem. 110 or <br> Math 200 or 227 <br> or 228 or 2075 <br> Elective |
| Year III | Geology 301 Geology 302 Geology 303 Geology 304 Chem. 210 or 230 | Geology 301 <br> Geology 306 <br> Physics 221 <br> Geology elective Elective | Geology 301 Geology 302 or 303 <br> Geology 304 or 308 <br> Chem. 210 or 230 Elective | Geology 301 <br> Chem. 210 or 230 <br> Two of Geology 408 or 460 or 304 Elective | Geology 301 <br> Geology 302 <br> Geology 305 <br> Biology 3321 or <br> 3323 or 3063 <br> Elective |
| Year IV | Geology 400 Geology 306 Geology 404 Geology 403 or 453 Math, Phys. or Chem. elective | Geology 303 <br> Geology 400 <br> Geology 405 <br> Geology 304, <br> 404,445 , or <br> 460 <br> Math, elective | Geology 400 <br> Geology 454 <br> Geology 407 or 408 <br> Geology 460 or 404 <br> Physics, Biology or <br> Math, elective | Geology 400 <br> Two of Geology 407 , or 454 or 408 <br> Geology elective Elective | Geology 303 or 304 <br> Geology 400 <br> Geology 455 or 402 or 456 <br> Geology elective Biology, Phy. Chem., or Math, elective |


| Year I | $\begin{gathered} \text { I } \\ \text { with Physics } \end{gathered}$ | $\begin{gathered} \text { II } \\ \text { with Chemistry } \end{gathered}$ | $\begin{gathered} \text { III } \\ \text { with Biology } \end{gathered}$ |
| :---: | :---: | :---: | :---: |
|  | Geology 100 <br> Mathematics 100 <br> Two classes chosen from Languages, Humanities or Social Sciences |  |  |
|  | Physics 110 | Chemistry 110 | Biology 1000* |
| Year II | Geology 201 <br> Geology 202 |  |  |
|  | Elective <br> Physics 211 and 231 <br> Mathematics 200, 220 or 228 | Elective <br> Chemistry 210 <br> Mathematics 200, 220 or 228 | Elective <br> Biology $2000^{5}$ <br> A class in Chemistry, Physics or Mathematics |
| Year III | Geology 301 <br> Elective |  | Geology 305 Elective |
|  | Elective <br> Physics 315 or 335 <br> Geology elective | Chemistry 230 Chemistry 320 Geology elective | Biology 3321 <br> Biology 3323 <br> Geology elective |
| Year IV | Geology 303 <br> Geology 306 <br> Geology elective <br> Physics 320, 416 or 445 <br> Mathematics 200,220 or 228 | Geology 401 <br> Geology 454 <br> Geology elective <br> Physics or Biology elective Chemistry 410 | Geology 401, 456 or 457 <br> Geology 302 <br> Geology elective <br> Biology elective <br> Physics 221 or Mathematics 200, 220 or 228 |

## Note:

(1) A student who intends to concentrate on geophysics might consider auditing Geology 452 in his fourth year.
(2) All students are encouraged to attend one or more non-credit computer programming classes.
(4) A student who intends to concentrate on paleontology should consider obtaining Geology have to satisfy Faculty regulations concerning a comprehensive examination 456 in his third and fourth years re writing an honours thesis in their fourth year. They should consult a staff member well in advance, no later than the third year.
In the case of students doing Combined Honours, Geology and Biology this requirement may be met in one of three ways:
(a) Write a comprehensive examination (after 20 classes).
(b) Write an honours thesis (after 20 classes), as an Honours student in Geology alone would do.
(c) Write a thesis to count as a class, Biology 4900, and write a comprehensive examination.
(5) *Students with Grade XII Biology should do Biog 2000 , or tho $2010 \mathrm{~A} / \mathrm{B}$ to $2060 \mathrm{~A} / \mathrm{B}$, not Biology 1000 , with appropria in other years.

## Classes Offered

Classes in Other Departments
students doing the major part of their work in eology should be aware of relevant classes in ther departments. They change from time

Biology
3321 Invertebrates I
3063 General Ecology
3061B Structure and Functions of Ecosystem
3062A Structure and Functions of Ecosystems
4064C Pleistocene biogeography
Chemistry
10 X-ray Crystallograph
512 Crystal Chemistry
Mathematics
206A Probability and Mathematical Statistics with Geology 521)

220 Applied Mathematics 227 Numerical Methods and Fortran Pro-
228 Applied Mathematics for Engineers I 328 Applied Mathematics for Engineers II

Oceanography
$200,511 \mathrm{~A}, 512 \mathrm{~A}, 513 \mathrm{~B}, 514 \mathrm{~B}$ Introductory Classes. 522, 523, 524, 525, 531 Advanced Classes.

## Physics

335 Electronics
645 Advanced Geophysics
Geology 100, Geology 101 and Geology 140 .
The study of the earth is ased 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, geology. Let us illustrate one aspect
know that a huge mountain chain know that a huge mountain chain
beneath the Atlantic Ocean, runnin beneath the Atlantic Ocean, runnine
thousands of miles and rising above se thousands of miles and rising above se
islands such as St. Helena and Icelan islands such as St. Helena and
Mid-Atlantic Ridge is the place wher slowly brought from the interior of increasing the area of the Atlantic 0 Americas slowly move westwards aw
this Ridge, and Europe and Africa slow this Ridge, and Europe and Africa slo
eastwards. One consequence of this as eastwards. One consequence of this
is that the youngest rocks will be fou is that the youngest ro,
middle of the Atlantic, but the oldest
side. This turns out to be true. But ast side. This turns out to be true. But ask
questions of this sort: how would you ages of the rocks? or how would yo map of the rocks of the ocean floor o
Scotia for that matter? Animals living Scotia for that matter? Animals living
die and their remains are found in the die and their remains are found in the
the sea-floor. They provide the evolutionary changes; it is only by th fossils that we can trace the rise of primitive organisms living billions of
such as these are only a part of ff the earth. How are landscapes formed? ewould you seek oil? Or why does a point north? Does the earth's magnetic verse? What happens to living organisms does? What did Nova Scotia look like red million years ago?
duction to Geology lect.: 3 hrs.; lab H. B. S. Cooke.
an introductory class for student to take a degree in geology, and fo An attempt is made to guide the lo an understanding of the developive groundwork for further classes. A be prescribed, and texts and reference the library will be recommended at le times in the class. Laboratory wor ted in the field during the fall an 2 p.m. in the fall term because of early
in November. The field exercises result oduction of a geological map of a small
oduction to Geology, lect.: 3 hrs.; lab ( iternate weeks), H. B. S. Cooke.
an introductory class for students in Science. It is intended as a science
for students from disciplines other than It emphasizes the concepts and majo which concern the development and state of the earth and planets, and the of geological history upon the human nent. There are demonstration periods made to books and reference materia brary at appropriate times.
roduction to Geology, lect. and demon and lab.: 3 h
an evening class intended, like 101, fo professions involving deo not plan science or Math. prerequisites for this Under normal circumstances a student go from this class into Geology 201 or can enter Geology 240, 241 and 242

Hundred Level Classes in Geology
ohundred level classes fall into two

201 and 202 are for majors and students in Geology and must be take ntly. They are classes in which an in 300 and higher level ne retaining an awareness of the whole The two courses are integrated through field work in the geology of Nova amples and data collected on the field 11 be used for subsequent laboratory tions. One tutorial per week, alternat
ing between 201 and 202, will be an essential part of this program.

Note that the normal prerequisite for Geology 201 and 202 is Geology 100. Under exceptional circumstances Geology 101 and 140 may be
acceptable. Students majoring in Geology are strongly advised to select their other courses in Second Year in accordance with the prerequisites for $300-$ level Geology classes.
Geology 240, 241 and 242 are classes for tudents who do not intend to major in The only prerequisite for entrance to any of them is one of the 100 level Geology classes. They may not be taken for credit as Geology classes by any major or honours student in and 342 be and 342 may be taken for cedit as Geology classes.

201 Introduction to the Study of Minerals and Rocks, lect.: 3 hrs.; lab.: 3 hrs.; F. Aumento and staff
A rock is an aggregate of physically distinct substances called minerals. Most minerals have characteristic external forms and physical properties which reflect the regular arrangement of class will deal with the detailed study of these minerals from crystallographic, optical, chemical, economic and genetic points of view.

The study of mineralogy leads naturally into the study of rocks. The mineralogical composition and mode of cormations of a wide range of igneous, sedimentary and metamorph

Laboratory studies involve the identification of unknown minerals and rocks both in hand specimen and with the aid of the petrographic microscope.
202 Introduction to Stratigraphy, Paleonto logy, Structural Geology, lect.: 3 hrs.; lab.: 3 hrs.; P. E. Schenk and staff.

In combination with Geology 201, this class aims to introduce the student to greater depth 202 concentrates on the practical applicology field techniques and tools as well as laboratory procedures that a geologist uses to interpret rock. The geological evolution of Nova Scotia is used as a case history to illustrate these principles, techniques, and tools. Field trips are cycle to build a geologic section the rock province. Observations and samples are processed during indoor labs in both 201 and 202. The student is introduced to methods of surveying, simple structural interpretations paleontological dating and paleoecology, and
stratigraphic observations and principles used in deciphering the geological history of an area. Application of plate-tectonics to Nova Scotia serves as an example of the evolution of large crustal blocks.

240 Marine Geology and Geophysics, lect lab and discussion: 3 hrs.; one evening per week, D. J. W. Piper

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. 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 minor, and those who would simply like a
second class in geology (including high school teachers, or interested professionals at government institutions).
Prerequisite: any first level class in geology.
241 Environmental Geology, lect.: 3 hrs.; D. J.
W. Piper and staff W. Piper and staff.

Geology and man interact closely in their ceaseless attempts to modify the earth, man's habitat. The environment, be it at its most
artificial the city the highway or at its other most natural extreme, the continental shelf and ocean basin, is full both of resources and hazards. The nature of these resources, their
distribution, use and reclamation, will be discussed together with the prevention and prediction of the accompanying hazards in relation to modern use and technology.

242 Geomorphology, lect.: 3 hrs.; D. J. W. Piper and staff
The surface features of the earth are undergoing constant modification depending on principles related to time and the local environment.
Canada abounds both in the diversity of these environments, and in their variation with time during and subsequent to the last ice age. The classification of the resultant landforms,
ranging from desert to coastal and their ranging from desert to coastal, and their
appearance on maps and satellite remote sensing photography, will be illustrated.

As for other 240 classes, this course is not suitable as an alternative to other second year classes for students concentrating in geology in however, register in Geomorphology 342.

301 Igneous and Metamorphic Petrology, lect: 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 condition prevailing at the time of their formation.
Igneous rocks will be discussed under such topics as mineralogical and chemical classification, methods of depicting chemical data, mechanisms and environment of magma production, various mechanisms of magma evolution and comagmatic provinces. products of thermal and dynamic processes
operating on preexisting rocks. Stability re lations of minerals under varying temperaturespressure conditions and the concept of metamorphic facies will be stressed. 110.

## hrs.; lab.: 3 hrs.; M. Zentilli

This class is an introduction to the principles and processes governing the formation, nature and distribution of metallic mineral deposits
and the industrial rocks and minerals. Eco nomically significant mining districts in Canada and elsewhere are discussed to illustrate particular classes of ore deposits, their geological environments and the methods used in thei investigation.
A text will be recommended, but a considerable A text wil be recommended, but a considerable
volume of reading from technical journals will be required.
Prerequisites: Geology 201, 202, Geology 301 303 may be taken simultaneously. Exceptions are made to meet specific programmes, but the
student should consult the instructor and student should obtain permission.

305 Systematic Palaeontology, lect.: 3 hrs. lab.; F. Medioli, H. B. S. Cooke.
This class comprises a systematic survey of the major phyla of fossil organisms. The emphasis will be on morphology and taxonomy of invertebrate phyla, but a short survey of the main lines of evolution of vertebrates will be included. 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 library and museum are available.
Prerequisite: Geology 201 and 202 or Biology 2000 or Biology 3321. Note this class is suitable for Bie
geology classes.

306A Plate Tectonics, lect.: 3 hrs.; lab.: 3 hrs. J. M. Ade-Hall.

The study of the ocean floors by geologists, and geophysicists over the last talears has lead to a
revolution in our understanding of the way in revolution in our understanding of the way in
which the earth's crust is made. The continents are now known to be islands of light material which are carried on enormous plates. These plates are changing in form all the time, being added to at the mid-ocean ridges and lost at the deep trenches of the oceans. The past and
present collision of plates has given rise to the present counision of plates has given rise to the Ranges, Alps and Himalayas represent active plate collision and older ranges, such as the Appalachians, represent the fossilized effects of former plate collisions.

This class will describe the rapid developmen of ideas about the oceanic geology leading to the current state of the plate tectonic model of the earth's crust. Contributing evidence from many areas of geology and geophysics will be brought together in the current synthesis. This
means that the student will be introduced to earthquake seismology, the nature of the earth's magnetism, the radioactive dating of
lavas and to the results of the recent drilling
Introdution in prescribed text for the class, Spencer, will be found useful, and students are also referred to other texts and to the siderable amount of reading. Prerequisites: Geology 201 and 202,
nto the ocean floor from the " lenger" by the JOIDES team. We
looking at the geology of fascine as the volcanic Mid-Atlantic Ridge California and the San Andreas Fa ast Coast of Soum America. Th today.

The class will be taught so concepts, results and problems wil
discussed. Maths and physics will be discussed.
200 level.
Prerequisites For Geology majors:
and 202. Physics 100 or Math 100 and two 200 level Note this class is suitable for ph without previous Geology classes.

306B Introduction to Exploratio lect.: 3 hrs.; lab: 3 hrs.; J. M. Ade-H Canada has major mineral res Canadian Shield, and the sediment Aberta, the Arctic and the contine led in part or in whole to the discover of these. For example, aeromagne sed to delineate potentially $m$ eflection studies in the sediment used to map structures in which hy are trapped. This class is designed to principles of the main techniq exploration geophysicists, the ical, electromagnetic, magnetic ethods. Each exploration technic liscoveries and students will be abt some of the techniques for thems the laboratory.

## rerequisites: as for 306A.

## 307 Tutorial Class conducted by individ

 facultyThis course will permit a student hterests in any selected field of other classes offered. The student closely with his tutor, preparing discussion with him, and may even some investigation and prep
Note thents should efore registering for this class needs cannot be met by other udent may register without pe the Ch
advisor.

41 Environmental Geology, lect

## W. Piper and staff.

This is taught as Geology 2 ditional reading and exercises; tudents.
orphology, lect.: 3 hrs.; D. J. W
ght as Geology 242, but with readings and exercises; it is suitable gy credit for majors and honour
our Hundred Level Courses
Ceology 400 is normally a required
all honours (major) students in who enter an honours program in
hereafter. Honours (combined) stuGeology will not be required to take it would cause undue difficulty in their (2) Classes labelled "alternate years" ster for the class.
encouraged to participate in one or two seminars. Two term papers are required.
Prerequisites: Geology 302 completed, or being Prerequisites: Geol
taken concurrently

403 Advanced Structural Geology, hours to be arranged. G. C. Milligan. (Offered in 1973-7 and alternate years).

This class will consider the life-history of mountain range as a theme upon which to bas discussion of tectonic processes. It is proposed to use the
examples.

The class is conducted as a colloquium and participants will be required to read extensively in the relevant journal
Prerequisites: Geology 303 or permission, of the instructor.

404 Ore Deposits, Advanced Class, hours to be arranged. M. Zentilli (Offered in 1974-75 and alternate years).
This class is designed for graduate and senior undergraduate students interested in mining geology. It is taught by the case history method, in a colloquium, in which each student in turn leads the discussion for a 3-hour session.
The case histories are chosen to illustrate the The case histories are chosen to illustrate the considerable flexibility is possible to meet the special interests or requirements of the individuals in the class.

The text material is drawn entirely from the technical journals and reference works, and considerable volume of reading is required.
Prerequisites: Geology 201202,301 Prerequisites: Geology 201, 202, 301, 303,
304; Chemistry 230. Exceptions with the permission of the instructor.

407/510 Advanced Igneous and Metamorphic Petrogenesis, lect.: 3 hrs.; lab.: 3 hrs.; D. B. Clarke, G. K. Muecke. (o alternate years.)

A wide range of igneous rocks will be discussed from a petrogenetic standpoint. The petrogenetic problem for each rock type will be defined and then its origin considered in the light of recent information from the fields of
geochemistry, isotopic studies and phase equilibrium studies.

Metamorphic rocks will be discussed as products of physico-chemical processes in open and closed systems. Experimentally determined phase relations of metamorphic minerals will be
critically examined and correlated to natural assemblages. The development of metamorphic belts will be studied in relation to the evolution of the continental crust and plate tectonics. Prerequisites: Geology 301, Chemistry 210 or 230.

408/511 Advanced Mineralogy and Crystallography, lect.: 3 hrs.; lab.: 3 hrs.; F. Aumento D. B. Clarke, G. K. Muecke. (Offered in 1974-75 and alternate years).

Advanced work in crystallography and crystal chemistry preceeds a systematic examination of the chemistry, structure and occurrence of the
major rock and ore-forming minerals. Laboratory work includes the use of X-ray and other modern analytical techniques in the identification of minerals and determination of their parameters, symmetry and structure.
Prerequisites: Geology 201 and 202 .

445/545 Physics of the Earth, lect.: 3 hrs.; P. $445 / 545$ Physics of the Earth, lect.: 3 hrs.; ,
H. Reynolds, R. D. Hyndman, M. J. Keen and H. Reynolds, R.
J. M. Ade-Hall.

This is a class in solid-earth geophysics. Topics discussed include: the figure of the earth and gravity, seismology and the internal structure of
the earth, the geomagnetic field netism - the prehistory of the geomagnetic field, heat flow and the earth's thermal history, electrical conduction in the earth, radioactive processes and the age of the earth, global geophysics, continental drift and sea-floor
spreading. spreading.
Taught concurrently with Physics 445 , See also Geology $462 / 562 ; 306 \mathrm{~A}, \mathrm{~B}$; Oceanography ${ }^{511 \mathrm{~A}}$.
rerequisites: Registration requires the prior consent of the Department.
Texts: Wyllie, The Dynamic Earth, (Wiley, 1969); Garland, Introduction to Geophysics, Mantle, Core, and Crust, (Saunders, 1971).

452/502 Earth Science Seminar, one afterno per week; P. H. Reynolds, R. D. Hyndman, J M. Ade-Hall, M. J. Keen, and others.

This is non-credit seminar course given concurrently with Physics 645, Oceanography 645. All geophysics graduate students are expected to attend.
453/503 Hydrogeology, hours to be arranged; Staff (Offered in 1974-75 and alternate years).

This class studies the occurrence, movement and distribution of water, as related to earth materials, with emphasis on the exploration, development, utilization of gro

The class work includes the principles of groundwater flow, aquifer hydraulics (with problems including well design and completion), water chemistry, hydrologic systems, i.e. groundwater-surface water interaction, an digital modelling. Problems regarding the
groundwater flow system and natural and groundwater flow system and ne nitural contaminants will be discused including such items as nitrate contamination and land use relationships, contamination due to de-icing salts, oil and gas, fertilizers, pesticides, herbicides, and other pollution sources. The disruption of the natural groundwater
system due to construction works will also be examined.

Students will be asked to present and pa ticipate in seminars.
 .

 f e r discussion course designed to bring to sciences may be expected to meet hext decade. Some of these probconcern the recognition and extracrdous natural conditions, the manage natural resources, a very important one of the major suppliers of minerals world and the control and prevention of nental damage caused by mineral ex
transportation or use. Other problems, the same intellectual approach judgements on the meaning of the on and deciding the courses of action will concern the more academic earth He will probably be following the the current revolution in our under or looking at heterogeneity in the deep
s: 200 and 300 Level courses or permission of the instructor

Sedimentology and Sedimentary
lect.: 2 hrs.; lab.: 3 hrs.; D. J. W.
follows naturally from 302. Students ave not taken 302 will be expected to up the background themselves. Topics to tary textures and structures, the com-
of sediments, their classification and of sediments, their classification and shales, limestones, and non-clastic
Special emphasis is put on the e, the dispersal and the del.
as well as their diagenesis.
the laboratory period students work on shich were discussed during the They will familiarize themselves with
ferent types of sediments both macally and microscopically. Students are

The abundances of the elements and their distribution in the solar system, the lithosphere the hydrosphere and the atmosphere will b The emphasis of the course will be on demonstrating how principles of crystal chemistry, thermodynamics, solution chemistry etc. can be applied to the solution of geological problems. Discussions on such selected topics as exploration geochemistry, environmental geo-
chemistry and lunar geochemistry will be chemistry and lunar geochemistry will be
included if time permits. Students will be encouraged to pursue some aspects of the course at depth and to present the results o heir investigation in the form of two term their papers.
The laboratory will consist of an introduction to methods of rock and mineral analysis and will include an exposure to classical, spectrophotometric, flame photometric, atomic absorption, X-ray fluorescence and neutron activation analysis.
Prerequisites: Geology 201 and 301; or a good
background in Chemistry Students wish in take this class should have a good background in either geology or chemistry and should consult the instructor before registration. Not hat this class may be taken by students with a ood background in Chemistry who have take o previous geology classes.

Geology 455/505 Advanced Earth History, lect and seminars to be arranged; P. E. Schenk (Offered in 1973-74 and alternate years.)
This class is designed to apply plate tectonics to the earth's past, and so to evolve the history of the earths continental masses. The initial phase
will describe in lecture format the geology o these continental blocks. After this survey, the theory of plate tectonics will be applied to the Northern Appalachians and will involve the
geology surrounding the North Atlantic basin geology surrounding the North Atlantic basin
After this example, seminars by students will attempt to reconstruct the evolution of chosen continental areas.
continental areas.
Prerequisites: Geology 302 and Geology
401/501.
456/506 Introduction to Micropalaeontology hours to be arranged; F. Medioli. (Offered in 73-74 and alternate years.)

The class gives a general systematic study of the major groups of microfossils, mainly foramini-
fers, ostracod and calcareous nanyoplankton. It is intended to provide a survey for those who do not plan to go further with the subject, and
to provide the necessary basic knowledge of principles and concepts for those now wis to continue in stratigraphy, historical geology and micropalaeontology

Particular emphasis will be put on recent microfauna and techniques for sampling and
studying them. The class involves only one hour studying them. The class involves only one hour
a week of formal lectures, but at least one
afternoon laboratory class. Each student will be asked to present a seminar during the year

457/507 Principles of Pleistocene Geology, H. B. S. Cooke. (Offered in 1973-74 and alternate .
A seminar class designed to expose the student to the special problems involved in the interpretation of Pleistocene deposits, rather than to The altar study of Pleistocene stratigraphy. tribution and nature include: the origin, dis mont in glaciers and ice caps; and ice; move pent; in glaciers and ice caps; glacial stratigraclimatic changes evidenced in non-glaciated regions; theories of ice ages.

A special half-credit laboratory programme complimentary to this seminar is offered in th Department of Biology as Biology 4064C,
Pleistocene Biogeography, and all students taking the seminar are urged most strongly to take Biology 4064C as well; it will be counted, where convenient for the student, as a geology credit Geology 464C. For details see entry
under Biology 4064 C credit Geology 464 C
under Biology 4064 C .

Students who are admitted to the class are expected to possess sufficient background to be to prepare competent seminar talks, which Although this will part of the programme. Although this will normally mean a good standing in biology will be admitted. Reading forms a substantial part of the class as there is no single text available.
460A/560A Principles of Isotope Geo chemistry, lect.: 3 hrs.; lab.: 3 hrs.; G. K 75 and alternate

The study of naturally occurring isotopes, bo radioactive and stable, forms a major and eve expanding field of geochemistry. This class concepts of nuclear chemistry such as types nuclear disintegration, nuclide systematics, nuclear reactions, etc. The role of isoto fractionation in geological processes will be discussed with reference to stable isotope articular attention will be paid to the isotope geochemistry
oxygen. oxygen.
Prerequisites: A good background in Geology
or Physics, or Chemistry, and permission o instructor.
460B/560B Geochronology, lect.: 3 hrs.; lab.: 3 hrs.; P. H. Reynolds; (Offered in 1974-75 and alternate years).

The absolute dating of pre-historic events, be hey the shaping of tools by ancient man or the formation of the solar system, constitutes fundamental problem encountered in most
geological and geophysical studies. The emphasis in this class will be on methods of ag dating based on the radioactive decay of
naturally occurring isotopes; other methods will
be discussed briefly. The role
isotopes and their daughter isotopes and their daughters as
geological processes will also be str Prerequisites: Geology 460A, plus a good background in geology
or chemistry, and permission of ins

## 461/561 Marine Geology and

 hours to be arranged; M. J. Keen aWe are concerned in this class modern concepts and technique of the year take a few topics and co in some detail. A study of one of the the Atlantic coast of Nova Scotia integral part of the course, occupy
days in the fall term, to be arr o days in the fall term, to be arrange
convenience of the class and instructor Prerequisites: Geology 302 or permission of instructor.

## Reynolds.

This will be a theoretically-orient designed for senior undergraduates mathematics and physics will required.

Topics: Fundamental of elasticity the wave equation, plane seismic layered media, seismic interpretation potential field theory, reduction and
tion of gravity data, reduction and it tion of magnetic data, the resistivity electromagnetic induction theory, met interpretation.
Prerequisite: Interested students should
with instructor with instructor.
Text: Grant and
Applied Geophysics, McGraw-Hill, 196

463/563 Numerical Methods,
arranged, P. E. Schenk. (Offered in and alternate years.)

This class deals with numerical me ll non-mathematically orientated pop designed to show how to plan an geological problems, and to store, man
and analyze data to solve such prob and analyze data to solve such prob
computer-based analytical techniques ing simple programming). The class parts (1) simple applied statistics, and ming via BASIC (or FORTRAN); (2) dion of statistics using the machine to
data information and retrieval, data p data information and retrieval, data pol sampling schemes, data analysis in
fiction schemes, and simulation of environments using mapped litho/biofa

## Geology Seminar

Papers are presented by guest speakers hers of the staff and senior stud graduate students are required to attend

## Field Classes

with good degrees in any of the mathematics who wish to study leading to the degrees of M.Sc. and ossible in a number of different fields. claude for example: Appalachian stunomic geology, hydrogeology, petrolration development, marine geology hysics, Quaternary studies, micropalae and sedimentology.
iplinary studies are encouraged, and active cooperation between the science usia University. There are many studies sciences carried out in other depart of the University; for example, geostudies are also conducted within the nent of Physics, and Quaternary studies
he Department of Biology. Students are he Department of Biology. Students are
o take full advantage of the opporthis affords. Research is often done in ion with government laboratories such Department of Mines, Nova Scotia Foundation and Bedford Institute mplex of departments and laboratories
ifax and Dartmouth concerned with aspects of the earth makes graduate earth sciences very attractive.
other information see the Graduate $r$ and write to the Chairman, Depart Geology

German studies may be divided into two Year III
programmes. The first is the study of the 11-12. German 301,303

German language itself, the second the study of German contributions to the European literary and philosophical tradition.
Many students will take German to acquire knowledge of an important foreign language. German is spoken in Central Europe (Germany, Austria, the major part of Switzerland, and some other areas). German will prove useful in
academic fields such as philosophy, music, history and the social and natural sciences. It is also relevant to some of the professions involving international relations in government, journalism and business. Several introductory language classes (German 100, 150) intermediate (200, 201, 202), and advanced (300) Special aids include a language laboratory and the setting up of conversation groups.

Classes in German literature and thought are offered to students who wish to pursue further the greatest achievements in the European tradition, particularly in literature, music and philosophy. The years between 1750 and 1830, to mention just a period of eighty years, produced such figures as Goethe and the Romantics, Mozart and Beethoven and Kant and Hegel, the representatives of German

Classes offered cover all German literature from the 16th to the 20th century, studied either in the context of cultural periods or as the work of individual writers.

Advanced studied in German will prove useful to high school teachers; they will also prepare students for graduate studies and professions such as those of critic, editor, translator and university professor

## Degree Programmes

General B.A. in German
Students concentrating on German should take minimum of three German classes beyond the 00 level.
gramme)
Honours in German (major proStudents considering an honours course are advised to consult the Department of German Year I
Year I
I. German 100 .

1. German 100 .
2-3. Two classes from Classics 100 , Comparative Literature 100, History 100, Philosophy 100.
2. A social science class.
3. An elective.

## Year II

9. One class from Classics 100 , Comparative Literature 100, History 100, Philosophy 100 . 10. An elective
10. One class from German 300, 302, 352 14. A class in the minor subject

## Year IV

16. German 400 .
17. German 401 or 402.
18. One class from German 401, 402, 451, 19. One class in the minor subject.
19. An elective.




Combined Honour
It is possible for students to take an honours Russian, Spanish, English or 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 Departmint 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 Course (such as German 200) or equivalent.
2. Structure of Programme.
a) intensive language training (German 300) b) philosophy and linguistics (German 350) c) teaching methods (German 35
d) work in German civilization
d) work in German civilization

## Introductory Classes Offered

Introductory classes do not require previous knowledge of German.

100 German for Beginners, lect.: 3 hrs. 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 required. Its equivalent is two years of German
in high school with a final mark of $75 \%$ or better. While the texts may be similar to those used in high schools, the University course offers more facilities for learning, such as language laboratories and opportunities for oral
work, supplies of books, and magazines work, supplies of books, and magazines and
papers in German for study. More independent papers in German for study. More independent
work is demanded of the student than is customary in high schools.

The class is taught mainly in German, emphasizes the spoken language, and provides the


 f  n
student with the knowledge of basic grammar.
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$\qquad$

Intensive language laboratory work and attendance
quired.
Text: Schulz/Griesbach: Deutsche Sprachlehre für Auslïnder. Grundstufe in einem Band.
Glossary: Deutsch-English. Deutsche Glossary: Deutsch-English. Deutsche Spra-
chlehre für Ausläder. Grundstufe in einem Band. Hueber Verlag, München.
This class or its equivalent is a prerequisite for all classes on the 200 level.

105 German Reading Course for Beginners, lect.: 3 hrs.

This class is designed for students who wish to have a good reading knowledge of the German
language. A succesfulul completion of the course language. A successful completion of the course
should enable the student to read German newspapers and texts in the humanities and secial sciences. This course may also be chosen as a prerequisite for German 201. To proceed
to German 200 a student must have a high to German 200 a student must have a high
second class mark or the permission of the second class

All students are required to attend a tutorial hour per week to promote reading fluency.
Text: Jannach, German for Reading K ledge., American Book Co., New York. German periodicals and newspapers.

110 German Literature in Translation, lect.: 3 hrs.; R. Ilgner.

Major works by Hesse, Kafka, Brecht, Büll,
Grass, Weiss, Dürrenmatt, Mann will be read Grass, Weiss, Dürrenmatt, Mann will be read and discussed in English. Although there is no
prerequisite for this class, it is recommended for students taking a beginner's German class concurrently. Detailed reading lists will be available from the Department before pre-
registration in the summer. Practice in written registration in the summer. Practice in written
and oral reports will be carried on throughout and oral

150 Intensified German, lect.: 5 hrs.; lab.: 2 hrs.; A. Roulston.
This class combines the objectives of both German 100 and 200; no previous knowledge
of German is required. German 150 counts as of German is required. German 150 counts as
two classes, equivalent to those of German 100 and 200; it is thus designed for those students who wish to take German for their first-year elective. Students who wish to acquire firm command of a foreign language may con-
centrate their efforts in one year; students centrate their efforts in one year; students
planning to proceed to advanced language or planning to proceed to advanced language or
literary classes will be provided in their first year with the entrance requirements for classes beyond the 200 level.
The final objectives of the class are the same as hose of German 200: oral and writing fluency on the basis of expanded knowledge of gram-
mar and vocabulary.

Students will first become familiar with the basic patterns of spoken and written German and will learn to use them through repetition.

Students will acquire a vocabulary of about 600 words. In the second stage, instruction will translation on systematic grammatical studies, competence will be developed throughout the whole year.

Students will spend an average of two hours a week in the language laboratory to support grammatical studies and to develop aural comprehension. One hour a week will be
dictated to conversational practice exclusively dictated to conversational practice exclusively
Text: Schulz/Griesbach: Deutsche Sprachlehre für Auslïnder, Max Hueber Verlag, München

## Intermediate Classes Offered

Intermediate classes are based on German 100 high schoo
At the outset of these classes, the student should have a vocabulary of approximately 600
words and the ability to understand simple questions in German, to write a composition of about 80 words and to summarize or retell a simple story. The student should also have basic knowledge of grammar including declen sion of nouns and pronouns, conjugations of tion, declensions of adjectives, syntax - main clauses, dependent clauses, questions, impera tives, direct speech. The knowledge required can be found in books of German 100 or Grade X, XI, XII German, and in German basic work lists.
${ }_{202}$ A combination of German 200 and German 202 serves as an accelerated Intermediate
German course and is designed for students who want to make rapid progress in the language
200 Intermediate German, lect.: 3 hrs.; K. , G. Josenhans, H. G. Schwarz.
The main aim of this class is to develop in the student a certain degree of speaking fluency as
well as writing skills through the improvement of grammatical knowledge and vocabulary. The class is based on German 100, high school German or equivalent basic knowledge. Since considerable stress is placed on this class on oral training, study of grammar will be limited to one hour weekly, given in English; the rest of
,
Language Laboratory work is required. Small conversation classes once a week as an aid to speaking fluency are compulsory.
This class will continue to employ learning techniques to which students are familiar from their high, school instruction and which are
designed to teach students how to use a modern vocabulary and common grammatical and syntactical patterns. Students will find that the type of work they have been accustomed to perguae loss will now have to be done in the language laboratory, while most of the instruc ture and a complete modern Ge grammar.
Prerequisite:
G rerequisite: German 100 or equivale
Texts: Richmond/Kirby, Auslese, Hill); Robert O. Roseler, German development of their language abiliti

## 201 Scientific German, lect.:

 Roulston.his is primarily a reading and tran designed to enable science studen ific journals in the original grammar text used in the class emph aspects of grammar that must be ccomplish this. Class work emphas he analysis of typical sentence co building and sight translations. material is assigned from many sou major scientific fields. Students are or bring in additional reading mate own interest to discuss in class. On has sufficient knowledge of gramm basic vocabulary of scientific texts,
have little difficulty in acquiring terminology of his own particular fie able to translate even at sight, with acility and speed. A reading kn erman is a prerequisite for m degrees.
Text: Eichner and Hein, Reading Scientists, (Chapman and Hall, Lond

## 02 Exercises in Translation and Co

English texts from various period
different types will be translated int
These translations will lead to the dis sesific difficulties of grammar and tion. Students must prepare trans compositions for each class. Dict iven once a week. The class will be mainly in German.

221 Introduction to German Literatur
221 Introductio
hrs.; K. Fricke.
A study is made of selected texts re major periods of German literature be related to the various stages in th ment of German civilization. The serves as an introduction to literary
At the beginning Middle High G translation) and Baroque literatur studied. The class will then concentr two outstanding periods of German $1750-1830$ (Lessing, Goethe, Schille
and the 20 th century (Kafka, Brecht).
will also provide the material for of the characteristics of literary iterary language" will be offered onc
German 200 or equivalent.
Advanced Classes Offered
classes are based on German 200 or ent knowledge.
Composition, 3 hrs.; R. Ilgner
f the class is to develop in students of the class is to develop in students

to express themselves freely and in different styles (e.g. personal and tters, reports, descriptions) within the of present day German social, | cultural and scientific life. Students |
| :--- | and to write essays on various topics.

will also study the various uses of , idioms, different meanings of similar words within changing contexts, and within selected word pattern
: German 200 or equivalent.
1973/74).
studies German literature between the 18th centuries as a direct reflection of portant religious, social and scientific ments in Germany after the ReformaWar. Poetics, poetry, drama and prose gins in Humanism and the Renaissance ir functions for the following literature
discussed. An introduction will be given orics, the art of emblematas and almysticism and mannersim which deter d characterize the European literature Baroque Age. The discussion will ate on the works of Brant (Ship of Grimmelshausen (Picaresque novel),
(martyrdrama, sonnet), Flemming m) and Angelus Silesius (mystic The study of these texts will give th a thorough understanding of the
e: German 200 or equivalent
an Literature in the Age of Enlighten: 2 hrs.; K. Fricke.
and philoment of Enlightenment laid and philosophical foundations of the
world. Its literature, predominately a of the socially rising bourgeoisie, is the ectly accessible to modern man. The the Age of Enlightenment in Gerre influenced by classical Greek and Crature, French and German Baroque Cervantes, Shakespeare and 18th angish literature that displays such opean nations, whether it was to free om their dominance or to draw inspiram them.

The class will examine the nature and extent of these influences as this is essential if the original
achievements of the period are to be evaluated. Knowledge of one of these literary fields would enable students to make considerable contributions to the progress of class work. The class
includes the study of important criticism of the period as well as the study of single works, in particular the following topics - fables (Gellert, Lessing), theoretical writings (Gottsched, Baumgarten, Lessing), poetic forms (odes, epigrams), Anacreontic poetry (Klopstock, Uz, Lessing), the epic (Klopstock), the novel
(Wieland, "Geschichte der Abderiten"), drama (Wieland, "Geschichte der Abderiten"), drama
(Lessing, "Minna von Barnhelm", "Nathan der Weise"). Students will also be introduced to the more important interpretations of particular works and of the literature of the whole period. Prerequisite: German 200 or equivalen

303 The Period of Transition: Goethe and his Time Part I, lect.: 2 hrs.; D. Steffen. (not offered in 1973|.74)
A study is made of German literature and witnessed the great revolutions of the 18th century. Stimulated by the success of the natural sciences and their rational investigation into nature, the Enlightenment turned against contemporary society, demanding that it be reformed on the basis of reason. The Germans, tions not in the form of political action, but in the form of artistic creation and philosophical reflection. German men of letters attempted to understand the tendencies of the age and sought to reconcile the revalionary spirit wi

The discussion of maio literary and theoretical writings of the time from 1770 to 1800 will first concentrate on later works by Lessing which reflect some of the inherent difficulties of Enlightenment. Following the course of
history, the writings of the young Goethe, of history, the writings of the young Goethe, of
Herder, Schiller and their contemporaries of "Storm and Stress" will then be studied. Criticizing Enlightenment, these writers expressed new conceptions of nature, history and individuality. Finally, Goethe's and Schiller's humanism or classicism will be discussed in an
attempt to reconcile the individualism of the attempt to reconcile the individualism of the
"Storm and Stress" with the objective forces in both history and nature.
Prerequisite: German 200 or equivalent.
320 German Special Topic Course, lect.: 2 hrs.
This course is designed to present subjects which are not regularly offered by the Departpast, contemporary literature, and topics which have connections with other fields of study. Subject and instructor will change from year to ${ }^{\text {year. }}{ }^{\text {Prereq }}$
dents who register 200 or equivalent. Stustudy will consult their advisor.

350 German Philology and Linguistics, lect.: hrs.; H. G. Schwarz.
The aim of the course is to familiarize the student with the German language in its historic
development as well as its present-day structures. The fields of phonology, morphology and semantics will be extensively covered and will also serve as an introduction to the methods of modern linguistics.
Students are expected to work independently or in groups on set projects.
Prerequisite: German 200 or equivalent.
351 Theory \& Practice of Language Instruction, lect.: 2 hrs.; H. G. Schwarz.

This class is given in conjunction with the Department of Education and will introduce he future teacher of German into theory and

352 Aesthetic Theories, seminar: 2 hrs.; F Gaede.

The development of arts cannot be understood without knowledge of its theoretical or philoPlato, Aristotle, Scaliger, Baumgarten, Lessing, Kant and Hegel will be discussed. Particular reference will be made to the historical connection between logic, rhetoric and poetics.
This leads to a better understanding of the This leads to a better understanding of the history of literary genres, of important conallegory or mannerism in literature and fine arts.
$P_{\text {rerequisite: }}$ German 200 or equivalent. 353 Modern Theories of Art and Literature, seminar: 2 hrs.; F. Gaede.
A detailed study is made of Hegel's Asthetik which is the foundation of modern theory of art. Selected examples of aesthetic theories in
the 19th discussion will also concentrate on important writers of the Hegelian tradition such as Georg Lucaks, Bertolt Brecht and contemporary
theoreticians of literature and fine arts. Prerequisite: German 200 or equivalent.

400 The Period of Transition: Goethe and His Time (II), lect.: 2 hrs.; D. Steffen.

The writings of the later Goethe and of Romanticism are studied
The time from about 1800 to 1830 was marked by the Napoleonic era, the forces of restora-
tion, and a society that became increasingly conscious of the discrepancy between reality and the ideals inherited from the revolution. Romantic literature and thought are both an
expression of and a reflection on these changes. expression of and a reflection on these chang tre
In this class an attempt will be made to trace the various positions of Romanticism. Romantic conceptions of poesy and reality also played
a part in the writings of the later Goethe. The
study of Goethe will specially consider the eason for his departure from Classicism, his lominant school cosm, and his relation to the dominant school of German Idealism. An will add to the student's understanding of th nature of the conflicts experienced by all of these writers.

401 Literature and Society, 1830-1880 seminar: 2 hrs.; K. Fricke. (not offered in

This class will concentrate on the literature o the "age of liberalism", the transition between feudal and industrial society. Summarily char acterized as "realistic", its literature reflects the profound social changes which the bourgeoisie values of this society

Works by the following authors will be studied Bëhner, Heine, Mörike, Droste-Hülshoff, Keller Storm, Hebbel, and Fontane. A detailed readin Prerequisite: German 200 or equivale

420 Modern German Literature, lect.: 2 hrs.; F Gaede.
A study is made of trends in German literatur centuries. The course of Europe's history i centuries. The course of Europe's history is
most sensitively reflected in the development of modern German literature. The insufficiency of the traditional literary forms to express the experience of a new reality resulted in a new literary language. The class will enable student
to understand this language. During the firs term poetry, drama and prose of Naturalism and Expressionism will be studied, particularly the writing of Gerhart Hauptmann, Franz Kafka and Thomas Mann. In the second term the works of Bertolt Brecht will be discussed

## 452 German Philosophy: Hegel's Phenomeno

 logy of Mind, seminar: 2 hrs.; D. Steffen.The Phenomenology of Mind, published in 1807, was Hegel's first major work. He in-
tended 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

Hegel's philosophy, the summary of the literary and philosophical concerns of two generations of German writers, is particularly important to the study of Romanticism, its critics such as Kierkegaard and Marx, and the school of ${ }_{P}$ Historicism
Prerequisite: German 200 or equivalent.

## Graduate Studies

The department offers a graduate programme
leading to the M.A. degree. Details of the M.A. leading to the M.A. degree. Details of the M.A. programme are given in
Faculty of Graduate Studies
P. Burroughs (Chairman)
J. E. Flint
P. Fraser
H. S. Granter
R. M. Haines
G. R. MacLean
P. B. Waite
P. B. Waite
J. B. Webster

Associate Professors
.. B. Frorgusson
C. B. Fergusson
P. D. Pillay
M. Reckord

## Assistant Professors

J. E. Crowle
J. Fingard
J. F. Godfrey
L. D. Stokes
L.D. Sutherland
G. D. Taylor

History as a Subject for Study at University A sense of history is a primitive need felt by individuals and by groups. Just as a perso needs to know who he is and how he arrive states and nations need a sense of their 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 comfortable set of beliefs about their own previous exploits and origns. There are stil means to soothe doubt and demonstrate the essential rightness of their own beliefs.

The academic study of history, however, concerned to discover as much as possible o the reality of the past and to interpret human behaviour in its changes through time. It is a
unique subject, scientific in the way it uses evidence, but still an art because the reconstruc ion of the past requires a disciplined imagin tion and an effective rhetoric for the communication of meaning
The contemporary world is one of intensive specialization, in which the varieties of hum
knowledge have increased well beyond the capacity of any individual to command them ill. These developments have reinforced the ole of history as the foundation of a person drontiors, because history can never dra human knowledge, although individual his torians will want to select that portion of especially relevant for them. History's field o study will always be the whole of huma experience.

History is the study of hown why changes hum life occur, and with what results.

Aims of Teaching and Study Many students entering university
classes have difficulty in adjusting university levels of study. The ability
what has been heard in what has been heard in lectures
memorize events which fall between the end of the class title is of lite Students should understand the natur problems which have been studied; the also command the knowledge which gained, in the sense of being able tested against such knowled allo

The subject of history does monolithic body of knowledge. understanding is a matter of interpre offering explanations for events and $m$
which are subject to which are subject to constant
scholars. Arguments, scepticism troversy are thus the very stuff of history student does not merel particular mass of information; h think for himself.

At all levels of study in history, guided through lectures and tuto encouraged to read books and artic
consider the same problems fro viewpoints. Dalhousie has an excelle tion of historical literature and th Library provides students with good co for private study and reading. S
encouraged to acquire gradually a chosen personal library from the la of excellent books published in form.

Degree Programmes
cevases in history are set out below. several levels of study. $100-$ level primarily for first-year students, classes treat broad geographical
specified periods; and $300 / 400-$ lev provide opportunity for specialized advanced work for the undergraduat.

The Department appoints advisors students. Before registration studen consult with departmental advisors co
their programme of study and shou departmental approval for admissio particular classes they wish to take.

1. General Degree Programmes Students who wish to major in hist $100-$-evel class and at least five or si two or three should be at the First-year students may take two classes in history.
Students who wish to build up specialization in history than the ancient history from the Classics D in economic history from the Department and in contemporary $h$ Department and in contemporary
classes offered in Political Science. Th
Department also offers a class in the
ch classes are listed in the Calendar
heading of the department con-
isciplinary Programmes
Studies Programme.
dies Programme (for details consult strment).

## irs Degree Programmes

## oose from several honour

A selection of classes in Medieval,
adern, and Modern European history phasis, if desired, on the national of European country.
merican: A concentration of classes in ry of Colonial North America and in
d United States national history.
Classes in African history may be
with classes in British colonial

British Imperial: A concentration of n the history of England and of the mpire and Commonwealth.

A wide selection of classes from North
, British and Imperial, African and $n$ history
grammes include related studies in e, literatur

Classes Offered at the 100 Level
his Century Has Ten Decades, lect.: 2 hrs ngements, D. H. Crook, J. F. Godfrey
ave we been for the last 100 years and d we get here? To resolve these cing the events, ideas and colour of the world through lectures, video tapes, ngs, and rap sessions. This is history fo oo think they hate history.

European History and Civilization (not 1973-74)
of Canada, lect.: 3 hrs.; P. B. Wait
ass will cover the development of Canada prehistoric Indian cultures to Pierre olitical history, but will range acros ic history as well as Canadian literature istory for people who like Canada.
Troblems of Historical Study and Writing,
2 hrs.
lass is for first-year students only, and is
d for those who plan to continue study
or closely allied subjects. It is
to introduce the student to the
problems of historical study, including the nature of historical evidence, how problems are nalyzed, what is meant by such concepts as tudent 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 particular problems in a field of special interest to the student
This is history for people who like history. This is history for people who like history
Some of the sections to be offered:
199/1 Revolutionary America and Republican 99/2, 1750-1820, J. E. Crowley
Fingard 199/5 Medieval Life and Thought, R. M. Haines 199/6 Blacks and Whites, 1496-1970, M. Reckord
99/7 Fascism and Nazism, L. D. Stokes 19978 British Imperialism and West African
Nationalism, 1850-1920, J. E. Flint, J. B. Webster
199/9 Canada, 1835-1935: Gentlemen versus Rebels, D. A. Sutherland Century, G. D. Taylor

## Classes Offered at the 200 Leve

History $100,102,120,199$ provide appropriate peparation for 200 -level classes.

European History
200 Medieval Europe, lecture/discussio , sessions, 2 hrs; R. M. Haines
Within a broader framework the class will give particular attention to the Age of Charlemagne, concept of decline in the context of The Later Middle Ages.
201 Early Modern Europe, tutorial: 2 hrs.; J. E. Crowley

This class involves a survey of European history, approximately from 1500 to 1800 . Among the topics treated are the Reformation and the Counter-Reformation, economic and cultural expansion overseas, the consolication the intellectual history of political and scientific development, and the changes and continuities in economic and social structures.
205 Modern Europe, J. F. Godfrey, L. D.
The class discusses selected topics in Modern European History, 1789-1945, at weekly two hour meetings. For each topic, there will be one week of general readings, one week of spestudent projects. There will also be seyeral guest
ecturers during the year. Attendance and actio participation in all sessions are required. A

British and British Imperial History
210 The History of England, lect.: 2 hrs. plus tutorial sections, H. S. Granter, P. Fraser.
The main features of English history, from Anglo-Saxon times to the twentieth century,
ary given selective treatment and put in ary 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, ture/ discussion: 2 hrs.; P.
M. Reckord, P. D. Pillay

The class examines a series of topics and themes, chosen principally in the period from the American Revoluation 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 will be given in the evening.

North American History
220 The Canadian Mosaic: Themes in Canadian History, informal lecture/discussion: 2 hrs.; J. Fingard, D. A. Sutherland.

History 220 explores major themes and problems in Canadian history from the seventeenth | lems in Canadian history |
| :--- |
| to the twentieth centuries. The treatment of | events will be topical and concerned with the French Colonial, the British Colonial, and

National Periods. Within these periods the National Periods. Within these periods the emphasis will be upon interest groups and the
colonial, regional, and ethnic characteristics of Canadian history. The class is designed to provide the undergraduate with an understanding of the Canadian experience and provide a framework in preparation for more advanced study. A section of this class will be given in th evening
, 222 Canadian Economic History, lect.: 3 hr (for details see Economics 232)
230 American History, lect.: 2 hrs.; D. H. Crook, G. D. Taylor

The class acquaints students with the process through which a colonial, then provincial, society became a continental force and finally a world power. Lectures and assigned reading give social, political, economic, and cultural development. The writing of essays encourages the mastery of specific knowledge of how those patterns became such. In this way, general themes of American history are the means by號 都

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 thinking and understanding.


240 History of Tropical Africa in the Nine－ eenth and Twentieth Centuries，J．E．Flint，J．

In lectures and tutorials students will be enabled to grasp and absorb some of the majo
themes of African pre－colonial history by sudy of the internal politics and developments of African states and societies such as the Yoruba empire，Ashanti and Dahomey in West frica，and African states like Buganda around the East African great lakes．The theme of ultural contact and it effects will be prominen 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 differ ng types of European rule，and African responses by resistance and nationalism which
culminated in the emergence of independent African states．A section of this class will be given in the evening．

## Classes Offered at the 300 Leve

300 －level classes in history are intended for third－year students who have completed work t 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 probabl of offering additional 300 －level classe

European History
300 Medieval Civilization，discussion／tutorial： hrs．；R．M．Haines（not offered 1973－74）
302 The Medieval Church，discussion／tutorial： 2 hrs．；R．M．Haines

History 200 or 300 provides appropriate back－ ground for this class．The approach is thematic Aspects of Christian belief and practice，art，
architecture，law，administration，and institu－ architecture，law，administration，and institu－
tions are studied within a mainly European framework．Classes will provide opportunity for the planning of individual themes and the discussion of problems which arise．All students will be expected to make informed contribu－ tion to such discussion and to write a small

305 Modern Russia，discussion／tutorial： 2 hrs．； （instructor to be announced）．

306 Modern France from the Revolution of 1848 to the Collapse of 1940，seminar： 2 hrs．； J．F．Godfrey

All my life I have thought of France in a certain way．This is inspired by sentiment as much as by reason ．．．．Instinctively I have the feeling that Providence has created her either
for complete success or for exemplary mis－ for complete success or for exemplary mis－
fortunes．If，in spite of this，mediocrity shows in her acts and deeds，it strikes me as an absurd anomaly，to be imputed to the faults of Frenchmen，not to the genius of the land．But
he positive side of my mind also assures me hat France is not really herself unless in the front rank；that only vast enterprises are
capable of counterbalancing the ferments of dispersal which are inherent in her people；that our country，as it is，surrounded by the others as they are，must aim high and hold itself straight，on pain of mortal danger．In short，to my mind，France cannot be France without greatness＂．（Charles de Gaulle，War Memoirs 1940－42）．

307 Modern Germany，discussion／tutoris
hrs．；L．D．Stokes
History 205 provides the appropriate back－ ground 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．

310 History of Science，lect．： 2 hrs．；tutorial： 1 hr．；J．Farley

This class is designed to accommodate students of the sciences and the arts．There are no 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 on the social context of science and the different sciences．This class is cross－listed in the Biology Department classes as Biology 3400 ，and may thus be taken as a science elective．

## English History 314 England

314 England under the Tudors and Stuarts discussion／tutorial with occasional lectures： 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，the agrarian revolution，Anglican，Catholic and Puritan，the ent parliamentry monarchy and the rule of law，and the growth of individual liberty．

316 England in the Nineteenth Century to 1867，discussion／tutorial，with occasional lec tures： 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

The class will examine selected political，social and intellectual histo
the transformation of the Liberal the transformation of the Liberal pa
pressures from Socialist groups， pressures from Socialist groups，the
movement and the varied forces of the ideals and policies of special $m$ associated with temperance，social imperial federation，tariff reform， suffrage，national service and defenc methods of political organization（wi
central or local government） tioneering or campaigns in the press．

North American History
325 Canada Within the Empire，
discussion／tutorial： 2 hrs．P．But History 213 or History 220 appropriate background for this examines the political，commercial， relations of Canada with Britain conquest to the eve of nationhood；
ing attitudes of Canadians and ing attitudes of Canadians and Engl
the developing empire；and the imperial policies and colonial conditio

327 The Nova Scotian Experience， hrs．；D．A．Sutherland
Either History 120 or History 220 pro appropriate background，and admis class examines the evolution of $N$ society from the settlement era to century．Emphasis will be placed on the internal and metropolitan pressu al community．Students are encoura local archival sources in the preparatio research papers．
328 The Age of Macdonald and Laurier， eminars with some lectures， 2 hrs．；
his class will deal with the g expansion of British North America through the Confederation period There will be emphasis on social and history，but students can expect Canadian literature．History 120 or essential prerequisite，and admiss stricted to third and fourth year reading knowledge of French is no but it is helpful．

## 29 Canadian Social History，seminar： 2 hn

 329 CanaHistory 220 provides the approp round for this class which exam attitudes and problems of various the population in the 19th and
centuries．The topics include： merican influences；immigration， and class structure；moral and so movements；manifestations of nativis
privilege and inequality．For th
considers the interaction of British th American colonial experiences from oratory and commercial ventures of the perial organization by the Treaty of in 1713．It serves as an exploration of hems of cultural diffusion and interac ortunately lacking in historiographical y．Focusing on patterns of growth and in political，economic and religious s，the class integrates the American experience with British settlement in
and political and cultural conflict at and major themes of the class are the of British and American politics，the deas as guides to action and limits of on，the transplantation and modifica ritish institutions，and the effect of the d on the old．
onial America，tutorial： 2 hrs．；J．E （not offered 1973－74）
and the Caribbean，seminar： 2 hrs． ss will examine the impact of im－
on the Caribbean：analyze the chara－ of Spain，French and British colonial
and the nature of the recurrent for independence．Particular attention paid in the second term to the origins o list revolution in Cuba and its current
Admission with the instructor＇s ern America：The Twenties，tutorial： 2 H．Crook．

United States in the Twentieth The Architecture of Complexity hrs．；G．D．Taylor
investigates the response of American and economic institutions to the of industrialization and urbanization． cuses on patterns of organization：the public and private corporate forms of cy；the emergence of new interest the impact of hese development The class will emphasize discussion idual research by the student within al framework．

## History

Origins of Tribalism and Nationalism
．E．Flint，J．B．Webster
240 or History 213 both provide an ate background for this class．Students
not have this preparation may be
ditted，but should consult the instructor before registering．
The class involves the comparative study of various types of nationalism as they develope enturies．The emphasis will be on tropicl Africa，which involves consideration of whether distinctions can be made between＂nationa lism＂and＂tribalism＂，but comparative materia from Afrikaner and Egyptian nationalism will be used．The class will consider such question missionaries on nationalism，the extent to which such movements were a reaction against colonial rule，the social contest of such move ments and the nature of their political，social and economic goals．Students will be expecte use documentary sources．

45 History of South Africa，lecture／tutorial， rs．；P．D．Pillay
History 213 provides an appropriate back ground for this class，or History 220 for tudents wishing to make comparative studie concentrates on the period since the British acquisition of Cape colony，and examines the evelopmen the English and Afrikans speakin wroups，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 Afrikaner nationalism and the development of apartheid．

## Classes Offered at the 400 Level

Both History 460 and History 499 are required of fourth－year history honours students；first－
year M．A．students may also attend History year ${ }^{4}$.
460.

460 History in Theory and Practice，discussion tutorial： 2 hrs．；P．Fraser

This class is intended to provide an introduc－ tion to the study and use of mediaeval records， mainly those from English archives，as well as practical stutruction in their transcriptuon．The Latin，so some knowledge of the language is required at the outset．

460 Historical Words and Ideas，discussion／ tutorial： 2 hrs．；P．Fraser
The topics covered will be adaptable to the needs and preferences of students，but in
general terms the class will consist of studies in historiography，schools of history，the diversity of historical topics such as art history or the history of science，and the debate about the

heor discipline of history．

499 Honours Essay，Staff
All history honours students and those i combined honours courses in which history
their principal subject，must write a substantial their principal subject，must write a substantion
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 ap－ propriate staff member

## Graduate Studies

M．A．and Ph．D．programmes in history offered．For details of classes，see the Calendar of the Faculty of Graduate Studies．

## Humanistic Studies in Science

Attention is drawn to the following classes， offered in several departments．All of these
classes are concerned with the humanistic classes are concerned with the humanistic
aspects of scientific thought and its develop－ aspect
ment．

## Linguistics

Students of a variety of disciplines and especi－ ally those whose chief interest if in languages
should consider the courses offered in linuis－ tics．They are normally available to students having a good knowledge of both English and another language，usually French．For details see under French（321，322，423）．

Mathematics

## Professors

J．Ahrens
E．Blum
M．Edelstei
號

## 

．  － s
$\qquad$
Biology $3400 /$ History 310 ，The History of Science；J．Farley．

Physics 402B；Special Topics in the History and Philosophy of Science．
Psychology 358，History of Psychology，J．W． Clark．

Philosophy of Science
Fhilosophy 305，Epistemology，A．Rosenberg．
Philosophy 465，The Philosophy of Science，A． Rosenberg．

Sociology of Science
Sociology 209A，Sociology of Science and departmental listings．
 ． ． d都
History of the Science

## Details of the above classes will be found under <br> H．Elliott．

As man has viewed his environment, he has always tried to find patterns and relationships within it. For example, it was discovered many right angled triangle have a very precis relationship to each other: much later it was learned that the period of a pendulum is proportional (to a fairly high degree of ac-
curacy) to the square root of the length of the pendulum. To aid his senses in the search for such patterns, man has developed all kinds of instruments and devices for accurately measuring all sorts of aspects of the universe from the between atoms to the distance ween stars.

Some of the patterns, for example the two cited above, are concerned with numbers while others, for example the precise beauty of whmetric crystals, are concerned wiut not numbers, and which are not readily measurable.

Mathematics is concerned with this kind of pattern or structure as an abstract entity which can be studied quite apart from the physical experiences which give rise to it. For example
the knowledge by ancient Egyptian surveyors of the fact that the sum of the squares of the engths of the two shortest sides of a right angled triangle is equal to the square of the length of the longest side of the triangle inspired the
ancient Greek mathematicians to examine right angled triangles as abstract objects and to
"prove" that the said relationship always holds.

Since so many of the relationships we have been talking about are numerical, a basic concern of mathematics is the structure of
numbers themselves. We all know that two numbers can be added together to give a third number but what is "addition"? What basic properties does addition have? Consider the following two collections of numbers:
$\begin{aligned} & 0,1,2,3, \\ & 1,2,4,8, \\ & 5\end{aligned}, 6$,
If we add 2 and 3 we get 5 while if we multiply 4 and 8 (which are the numbers in the second collection which are directly under 2 and 3 in the first) we get 32 (which is the number directly under 5). The laws of "indices" say
that this is true whichever pair of numbers we look at. Why? Is there any real difference between addition in the first collection and multiplication in the second?
More basically still, mathematicians are concerned with the meaning of the word "number". Greek mathematicians were greatly dis
turbed when Pythagoras's theorem (which we have already mentioned) led them to the discovery that $\sqrt{ } 2$ is not a "rational number", i.e., a number which is the ratio of two whole numbers. They were disturbed because they (and everbody else who had thought about it)
believed that all lengths should be rational. This is perhaps the first example of mathematics proving intuition to be wrong. Moreover, physics could never prove that $\sqrt{ } 2$ is irrational; even if a "perfect" right angled triangle could be drawn with the two shorter sides of length
one, the measurement of the third side would always be approximate i.e., to a certain number of decimal places.
Even more basic, bordering on philosophy but also a question for mathematics, is what is
meant by saying that Pythagoras proved that the square on the hypotenuse is equal to the sum of the squares on the other two sides.
Another set of problems for mathematicians arise from statements of physicists like the velocity of a moving body (such as a spacecraft)
varies continuously with time or that the velocity is a function of time. Further, if it is known just how the velocity "varies" with time, what can be said about the body's acceleration or the total distance it travels in a certain time? These are the problems which
gave rise to that part of mathematics called Calculus.

So far we have talked about mathematical
problems which arose directly out of physical problems which arose directly out of physical investigations. Mathematics, however, in its independently of the other sciences and, indeed, advance ahead of them. It was in 1830 that J. F. C. Hessel discovered the 32 "crystal classes" which describe all the possible ways in
which crystals can be symmetric. It was in the
ame year (but quite independently) the mathematical concept of a "gro which the crystal classes are good Again, at the beginning of this cent German mathematician David Hilb estigated the properties of what we n
"Hibert Space" which is anothe mathematical structure. It was number of years after that the physicist that this was precisely what was n describe "quantum mechanics."

Thus, mathematics is a study patterns and relationships, many of which $h$ tudy of them has usually proceeded to extent that very little trace of the problem is left.
You will probably find university math very different from high school mathem High School, the emphasis is usual computational skill. For example, a lot usualy spent in learning to use "log $\log (a b)=\log a+\log b$. $\log (a b)=\log a+\log \mathrm{b}$. In univers what does $\log$ mean.

It might be said that university math ourses fall into three types, with much and fuzziness at the edges.

1. A deep analysis of a particular with a title like Real For example, a cas detailed study of that unique mathemat structure which we call the real numbers.
2. A study of the interrelationships and ind play between various kinds of mathema structures. A class with a title like $a b$ lgebra might be of this type

A study of how real world problems to mathematical structures and how a light on (and sometimes solves) the problems. This type of mathematics is called applied and a class with a mathematical economics would be of th Because mathematical structures have so
arisen from physical experience and this used in its widest possible meaning, matics finds application in all fields of endeavour from rocketry to economics psychology to life insurance. Howeve mathematical structures themselves have mathematics has only a utilitarian mathematics has only a utilitarian
study can give great aesthetic pleasure.
ou will see that the words for exampt een used a great deal in the pr paragraph. This is because it is
difficult to define usic and religion, one only begins eeling for what mathematics is afte practiced it for a while.

## Degree Programmes

cs as an Area of Concentration. ts who plan to major in Mathematics arrange a programme in consultation a member of the Department. A major
mme will include $200,203-204$ (or amme will include 200, 203-204 (or
and valent courses) and at least one course
ibered 300 or above. The courses 102 , ered 300 or above. The courses 102 ,
$07,110,220,228$, and 328 may not be

Department offers courses of interest to in the following areas of Mathematics: and Differential Equations: 200, 300
is: $250,304,350$.
etry, Logic, Theory of Numbers: 202, 305, 307.
ra: 203, 204, 303.
Igebra: 203, , 204,
rrobability and Statistics: $206,306,310$ rical Analysis: $226,227,32$
students who wish to arrange inter-
inary programmes (with such fields as puter Science, Physics, Chemistry, Biology, logy and Economics) are invited
rs in Mathematics
nts who wish to take honours in mathe
s may not be able to complete their ses in the usual four years if they do not senior matriculation mathematics, unless
take a "make up" class during the summer take a "make up" class during the summer
nediately preceding or following their first ediately preceding or following their first
at the University. Such students should wlt the Chairman of the Department when ceppted. Other students interested in an ours degree should consult the Chairman of epartment before the end of their firs if possib
ollowing programme will normally be ved by students who plan to take Honours thematics. Adjustments which do not
and Year II
matics 100 (or 110 or 151) will normally en in Year I, and 200 (or 250), 203, in Year II. Math 203 and 204 may be in Year I by well-qualified students with
onsent of the instructor, in which case course may be elected in Year II.

## Year III and Year IV

300 (or 350) and Math 303 and five
tional classes at least two of which will be nbered 400 or above. Of these five classes,
nally 2 least three will be selected from ally at least three will be selected from
I I and II below with at least one from roup. Other classes may be selected from other offerings of the department.
$305^{*}$
$307^{*}$
401
403
311 and 312 320
330
402

## Note: These co

Honours Comprehensive Examination he Honours Comprehensive examination wil a a verbal presentation of an examination on suitable topic requiring comprehensive know
edge. The topic is to be selected in January of he graduating year for presentation in March.

Combined Honours
Students interested in taking honours in mathematics and another subject as a combined programme should consut the chairman of th department, through v.
combined honours programme may be ppropriate for many. Students contemplatin a combined honours course in mathematics and another subject should, however, bear in mind be insufficient for admission to a regular graduate programme. A qualifying year would usually be necessary

## Classes Offered

01 Fundamentals of Mathematics, lect.: 3 hrs,
This class may be offered in place of senio natriculation mathematics as a prerequisite for expected to have taken junior me sude algebra and geometry, but it should be possible or a good student to make progress in the clas with an accurate knowledge of operations with algebraic fractions and of solving linear and quadratic equations including simultaneous inear equations in woult the text prescribed for Grade XI in Nova Scotia to determine the background needed.
The principle objectives of the class, as take rom the preface to the current text, are: a) an appreciation of the natural origin and ideas from antiquity to the present;
b) a critical, logical attitude, a wholesom respect for correct reasoning, precise defini tions,
tions;
c) an understanding of the role of mathematics
as one of the major branches of human endeavour and its relations with other branches
d) a discussion of some of the simpler important problems of pure mathematics and its applications, including some which often come to the attention of the educated layman and
) an understanding of the nature and practic mportance of postulational thinkin.

Topics studied include: deductive logic, sets, opics studied include: deductive logic, set
evolution of the number system, the logic of algebra, analytic geometry, functions, elementary trigonometry, permutations, and combinations, binomial theorem and vectors and matrices.
100 Differential and Integral Calculus, lect.: 3
Probably the best way of conveying some idea of this class is to describe some problems which can be attacked by use of the calculus.

In high school one learns that the distances travelled by a body moving in a straight line at a constant velocity is given by the formula $\mathrm{s}=\mathrm{v}$. natural question is: What is the situation if he velocity is not a constant, but changes with case?
As another example, consider finding the areas of figures. In high school one finds that some areas can be easily calculated by formulae. Some of these formulae area easy to see, e.g., that for the area of a rectangle. Others are not at all easy to see, e.g., the area of a circle. One
may ask whether it is possible to find a method of calculating area which does not depend on prior knowledge of a specific formula.
Often, though of course not always, such problems can be solved by methods of the involved differentiation, the second integration. Problems which can be attacked by such methods often arise in the natural sciences, the social sciences, and other areas.
Topics studied include: limits, and continuity, differentiation and integration of elementary functions and applications.

One section of this class, section (13), is offered in which the study of calculus will be combined with an introduction to the use of a computer.
Prerequisite: Familiarity with Euclidean geometry, polynomials, elementary trigonometry, and Euclidean plane analytic geometry. In
addition to these specific topics, a degree of mathematical maturity is required. A student completing Grade XII in Nova Scotia or a salculus.

102 Mathematics for Liberal Arts Students, lect.: 3 hrs.
The course is intended for students at the university who wish to become acquainted with mathematics as an art rather than as a tool for lementary. It will discuss some of the more spects of mathematics for a student who has pleted senior matriculation in high scho completed senior matriculation in high sch

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Topics will include truth tables, examples of matical induction models, the integers, mathe versus the "finite"; the real numbers, some calculus - definitions and examples of the derivative and the integral and their elementary properties as far as the Fundamental Theorem of Calculus
Historical facts and cultural significance will be stressed continually

This class will be offered only if there is sufficient enrollment
Prerequisite: Senior High School Mathematics.
106 Introductory Statistics for Non-Mathe maticians, lect.: 3 hrs. (Half-course).

Through extensive use of illustrative real-life examples, the student is introduced to the basic concepts of statistics: data reduction, estima-
tion, and hypothesis testing These tion, and hypothesis testing. These examples
will be drawn from a wide variety of disciplines. The emphasis of the course will be on manipulations. The course is open to students of any year.
The principal aim of the course will be to enable students to identify and formulate the
statistical aspects of real-life problems and to become familiar with the statititical vocabulary most commonly used in scientific journals. The student must also become aware of the pitfalls that await the naive user of statistics. Students requiring a more extensive exposure to the
statistical methods of scientific experimenta tion are encouraged to follow this course with tion are en
Math 107.
Topics will include descriptive statistics, elementary probability and distributions, estimaPrerequisite: High school algebra.

107 Statistical Techniques of Scientific Experimentation, lect.: 3 hrs
This course extends the introduction of statistics provided by 106 to include a collection of
techniques that are widely used in the experimental sciences. Topics will include regression and correlation analysis, analysis of variance, and curve-fitting 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 techniques.
2) to explain the assumptions that must be 3) to illustrate the nature and methods of the necessary computations.
Prerequisite: Math 106.

110 Mathematics for Commerce and Economics, lect.: 3 hrs.
techniques which are useful in analyzing mathematical models in economics and management The material covered in the class is similar to certain topics (such as Taylor's series, volume of revolution) included in Mathematics 100 are not covered in Mathematics 110. In their place Mathematics 110 includes an introduction to matrix algebra, maximization of functio
two variables and Lagrange multipliers.

This class is intended as a survey class fo tudents who are not going to take furth work in mathematics. Students who are goin oo take other mathematics classes should tak Mathematics 100 rather than Mathematics 110 as Mathematics 100 uses a more rigorous
mathematical approach. Throughout the class, applications of mathematical techniques to conomic and management problems will be stressed.
Prerequisite: High school mathematics.

## 51 Differential and Integral Calculus fa

 Honours Students, lect.: 3 hrs.This class, to be formed in the second term, is designed for students who, after a one-term xposure to Mathematics 100 , have shown the troduction to Analysis.

Syllabus: The real line R (as a complete ordered Archimedean field); basic topology for $R$; the ooncept of mappings, in particular those of $R$ for convergence. Limits and continuity functions. Properties of continuous function like attainment of intermediate values, attainment of lub, etc.) Uniform continuity. Differ entiation, Rolle's Theorem, Mean-value Theorem, Taylor's Formula, Taylor's Series unctions. Integration, definiton and properties of Riemann integrals, evaluation. Fundamental Theorem; some techniques of integration, mproper integrals.
erequisite: Good standing in Math 10

## 200 Intermediate Calculus, lect.: 3 hrs.

It is assumed that students taking this class hav Conceptual aired some knowledge of calculus. is laid on manipulative techniques which lend themselves readily to applications in physics and engineering.
Topics include: real number systems, con tinuous functions and their fundamental pro convergence and divergence of infinite series power series, double integrals, functional determinants, geometry of euclidean vector spaces with emphasis on three dimensions, elementary Prerequisite: Mathemations.
Prerequisite: Mathematics 100

Two imp definition and proncepts in Mathe class. Symbolic logic is in the basis working knowledge of the logical including the universal and existential make precise certain used by the stu make precise certain statements in mat and as aids in proof. A first definit proof is part of the study of the prop
calculus. This definition is the predicate calculus is studied. A further augumented definition is giv the role of tautologies in proofs is discu
The real number systems are cơnstruc decimal rationals instead of the usual $C$ theory and abstract algebra is studied this topic self contained.
Prerequisite: Math 100.
203 Matrix Theory, lect.: 3 hrs. (Half
Topics will include the following: solu systems of linear equations, matri matrix operations, equivalence, rank, in diagonalization, canonical forms, deter and applications of matrix techniques
branches of mathematics as well as sciences and other disciplines.
Prerequisite: Math 100, 110 or 151, or of the instructor.

204 Linear Algebra, lect.: 3 hrs. (Half-c
Topics will include the following: spaces, bases, dimension, linear trans by matricesentation of linear transform Prerequisite: Math 203.

## 205 Projective Geometry, (not given

 1973-74)We begin with a brief discussion of th the "postulates" of Euclidean geometry,
ally the Parallel Postulate of Euclid, and to some elementary theorems of Non-Eu Geometry. Some of the basic propertic mon to the Euclidean and Non-Eu geometries are investigated. We in axioms for geometry which describe properties and the axioms are shown consistent and independent by giving
models or finite geometrics. The axio those for Projective Geometry
Projective geometry is then studied with topics including duality, De
Theorem, the harmonic relation, models for the projective plane, cross Pappus's Theorem, the Fundamental of Projective Geometry, conics. Introdu Coordinates in a projective plane, discu Coordinates in a projective
Klein's Erlanger Program.

[^5]is intended for anyone with an in Mathematics and geometry, especiThe linear algebra necessary shall be in the lectures.
ability and Mathematical Statistics, ${ }^{6}$ ti. 3 Probs.
bility Theory allows the mathematician to uncertainty quantitatively. Although one名 know for sure whether tomorrow's will be heavier than usual or not, it is
to state the odds of such an event gg using the language of probability. ormation that underlies such a stateould typically be derived from data
to our past experiences with patterns of The process of deriving information framework, and this formalization is
frat framework, and this formalization is
focus of the field of mathematical Information inferred from observed sually subject to the uncertainty in the and we again need the language of lity theory to express precisely ou such information.
ematical approach will be used throughcourse. The establishment of the ntals of probability theory will be
by the application of probability o the development of the principles o a reasoning. The course is designed to
a sound basis for further study in a sound basis.
lowing topics will be included
bability
theory, combinatorics, random vari probability distributions, mathematical tation, limit theorems, introduction to stic processes.
B. Msthematical Statistics

Mation Criteria and Methods, Hypotheses go (Parametric and Nonparametric)
ion and correlation, Chi-square tests.
equisite: Math 100
pplied Mathematics, lect.: 3 hrs.
lass is designed with the needs of science in mind. It includes the topics surface integrals, integral theorems, ial equations, sequences and series, $x$ analytic functions.
nts who intend to do advanced work in matics are advised to take Math 20
than Math 220 However, students who ete Math 220 with more than the m standing may be admitted to classes Math 200 is the normal prerequisite. will not be given for more than one of $20,220,228$ and 250.
quisite: Math 100.
roduction to Fortran Programming,
hrs. (Half-course).
his course provides an introduction to the ortran programming language which is in wide pplications aure included Particular arpersasis applications are included. Particular emphasis is
placed on numerical techniques appropriate to placed on nume

The course leads naturally into subsequent ourses in numerical methods (227) and ptimization models (230). The material is also elated to other courses in linear algebra (203),


227 Numerical Methods and Fortran ramming, lect.: 3 hrs. (Half-course).

This class provides an elementary introduction o some of the numerical methods used in almost all fields of the sciences. These method sually require the use of either a desk techniques studied include those for the soluion of polynomial equations, the approxima tion and interpolation of functions, some methods for numerical integration and differ ntiation and differential equations. Thes techniques are appral thar
tudents may offer for credit only one of 22 and 230 .
rerequisite: Mathematics 100 and 225 (or
rquivalent). equivalent).

## 28 A

 3 hrs.This class discusses various notions which are useful in studying physical phenomena. The A major portion of the first term is spent in tudying vector algebra and calculus special emphasis on the usual geometric spaces of two and three dimensions. Afterwards, brie
itroductions are given to the complete numbe ystem and functions of complex variables. Sequences and series are discussed and methods of approximating functions by series are in dicated. Finally, a study is made of ordinary on linear equations. The intent is to give future engineers some computational skills and knowledge of useful mathematical tools. Care is taken to present definitions, notational systems and statements of theorems with assumptions
explicitly stated explicitly stated. Intuitive arguments are presented
alism.
tudents offering Mathematics 228 will not be given credit for either Mathematics 200 or

23
330 Operations Research and Fortran Pro ramming, 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, eco. ted rat
omics and the sciences. These methods gener ally determine a best, or optimal, solution to model of the original problem. Using digita computers it becomes feasible to consider so

The mathematical methods studied include optimization techniques from the calculus, solution of polynomial equations, the simplex method for linear programming and the special versions for the assignment and transportation problems, as well as methods for dynamic a problems. These techniques are applied to variety of problems chosen from business, government and the sciences.
Students may offer for credit only one of 227 and 230 . 235 Foundations of Mathematical Astronom (not offered in 1973-74), lect.: 3 hrs.
This class is designed to give the students the mathematical background for a good unde
standing of the structure of the universe and solid foundation for possible further study or admission to the Armed Forces. It provides up-to-date information about recent achievements in stellar astronomy. The history of the de velopment of astronomical thought from ncient tims with the presented material.

The class starts with geometrical consideration about the sphere, spherical coordinates and some concepts of spherical trigonometry. Then the topics celestrial sphere, diurnal motion, eclipses, and problems in connection with the stars and stellar motions, are treated.

The mathematical treatment is of an elemen ary nature: students will require knowledge of trigonometric functions, simple differentiatio and polar coordinates.
consent of the instructo, which, with the consent of the instructor, may be taken
simultaneously

250 Intermediate Analysis, lect.: 3 hrs
This class provides a sequel to Mathematics 150 and 151 for those students who are interested in gaining an understanding of the background on which the techniques of calculus rest. Students who intend to continue their study of mathematics to a higher level are advised to
take this class. Mathematics 250 is a parallel take this class. Mathematics 250 is a paralel
class to Mathematics 200 in the sense that the same topics are discussed but from a more theoretical point of view. The main part of the class is concerned with functions which map n-dimensional space into m-dimensional space m are equal to 1,2 , or 3 .) For this, an m are equal to 1,2 , or 3 .) For this, an
understanding of linear algebra is essential so that concurrent enrolment in Mathematics 203 is necessary. The notions: continuity; integration; differentiation (these three topics refer

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ite: Math 100 and 225 (or equivale


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real numbers and of functions. Prerequisite: Math 151 or good standing in
Math 100, with the consent of the instructor.

## 300 Advanced Calculus, lect.: 3 hr

Functions of several variables, continuity, differentation, implicit differentiation techniques. Taylor's expansion; Jacobians (their geometric
meaning). Implicit function theorem; extreme values; multiple integration (especially transformation of double and triple integrals), line and surface integrals. Green's and Stokes'
theorems; series of functions; uniform gence; Fourier Series (sine and cosine series convergence theorems). Applications: boundary value problems; partial differential equations. Students who intend to honour in mathematics, or do graduate work in mathematics, should Prath nath 300 .

303 Modern Algebra, lect.: 3 hrs.
Knowledge of Algebra is indispensible to understanding the language within which most mulated. The Modern Algebra course and its subject matter are just as important to the student of mathematics as are Matrix Theory and Linear Algebra; it is both an extension and

The course syllabus includes the concepts, basic theorems and examples of permutation groups, abstract groups, rings, fields, and quotients. These topisc appear in every aspect of mathematical reasoning and are of wide utility in
applied mathematics, chemistry and physics applied mathematics, chemistry and physics.
Prerequisite: Math 203 and Math 204 or consent of the instructor

304 Foundations of Analysis and Topology; lect.: 3 hrs.

The main topics of this class are
i) Basics of Naive Set theory, an

Class Outline: Sets, operations on sets and a discussion of an axiomatic basis for set theory. Relations with particular attention to func-
tional and order relations. A fixed point tional and order relations. A fixed point
theorem and its application to Zorn's Lemma theorem and its application to Zorn's Lemma
and related matters (Axiom of Choice, Well Ordering Theorem). Cardinal and ordinal numbers and their arithmetic.

Metric Spaces, examples. Bounded, totally bounded, compact, and complete sets in metric spaces. Lipschitz and contraction mapping

Topological spaces, examples. Open and closed nectedness.
ner
Peresites.
Prerequisites: The equivalent of Math 200 and 204 and the consent of the instructor

05 Differential Geometry and Tensor Analysis, lect.: 2 hrs.

In differential geometry the properties curves and surfaces are investigated by means of calculus. The subject has various relations to on the one hand differential geometry forms an essential part of physics and geometry (measurements of the earth's surface) and on the other hand it is very much connected with differential equations, the calculus of variations, inspired generations of mathematicians for animated research. There are still sources available, which contain many precious ideas for further thought.
The class treats the topics: theory of curves heory of surfaces, first and second funda Gaussian and mean curvature, formulae of Weingarten and Gauss, curvature tensors Christoffel symbols, geodesic curvature, eodesics, mappings, absolute differentiatio nd the displacement of Levi-Civita.

The class requires knowledge of matrices, deter minants, the technniques of calculus, power equations
Prerequisite: Mathematics 200 and Mathematics
203.
306 Probability, lect.: 3 hrs
The class is intended to assist the student acquire as thorough an understanding of basic his mathematical background and to itlustrat the great variety of practical applications of probability.

The aim is not only to introduce probabilit and statistics but also to prepare the student fo also serve to promote greater awareness and appreciation of the potential value of probability and statistics to science and industry

The topics covered will include the following Fundamentals and axioms, combinatorial prol ability, conditional probability and indepen tions, laws of large numbers and central limit theorem, generating functions, random walks, and recurrent events. Markov chains, samplin from a finite population, derivation of $\mathrm{X}^{2}$ Students t - and f - distributions, estimation from samples, tests of hypotheses.
Mathematics 200. This may the level of currently.

307 Theory of Numbers, lect.: 3 hrs.
Congruences and residues; elementary pro perties of congruences; linear congruences;
theorems of Fermat, Euler and Wison; Chinese remainder theorem; quadratic residues; law of
offered in 1973-74)

Random variables, distribution of ran ables, discrete distributions, sampling
tions, interval estimation, point sufficient statistics, maximum estimation, statistical hypotheses, ratio tests, regression and correlation, ate normal distribution, sequential anal
Prerequisite: Math 207 or the Prerequisite: Math 207 or the equivalen 311 and 312 D
hrs. (Half-course)
ouses).
In any scientific or technological field natural laws expressed by relations are called differential equations. Newt of universal attraction, Kirchhoff's electricity, the law of natural growth and are examples of differential equations.
To answer questions of astronomy, chemistry, engineering, biology, etc. the which satisfy the given natural law particular requirements of the considered lem. In this way are found for example currents in an electrical network, the conc trajectory of a rocket the number of in a given culture, etc.

These classes contain a study of the elemen heory of ordinary and partial diffe equations. Emphasis is given to basic ach as substitutions, operators, tran
solution by series. Various applicatio studied, e.g. most of the above men problems, the motion of a satellite, et
Math 311 contains the topics diffe quations of he irrst order, Lapiace tra

Math 312 consists of ordinary diffe equations and partial differential equ The part of the class which deals with o
differential equations includes the differential equations includes the
solution by series, special functions, sys differential equations, total differential tions. In the part of the class on partia erential equations the topics linear partio
ms of mathematical physics solved ier series are included. 311 is prefor 312 and a knowledge of the topics ediate calcuius as covered.

Analysis, (Biweekly two hour sessions an the year, $1 / 2$ credit.)
rse provides the students with exin solving real statistical problems. The organized so that students act as
consultants, under the supervision of ctor, to scientists and others requiring with data analysis. The problems statistical consultant are the following:
y clearly the statistical component of lem facing the consultant.
whether the problem can be handled ndard techniques, and if not,
op a new technique.
will be encouraged to develop novel hes to the consultees problem. In so far ossible, a student will be able to follow
Consultation contact hours will on be replaced by survey lectures on
opics prepared by students. Evaluation opics prepared by students. Evaluation
ased on participation in consulting and survey lectures.
survey lectures.
and conse
duction to Numerical Analysis, lect.
of this class is to derive efficient ds for the numerical solution of problems various branches of mathematics. The more important aim is to provide an us mathematical analysis: under what perhaps does a particular algorithm work,
more essential, when and oes it fail to yield the desired results.
sill cover the following topics: ve solution of nonlinear algebraic equa(and systems of such equations), direct aic equations, iterative methods for eigenroblems of matrices, linear approximafunctions (interpolation, least-squares ximation, Chebyshev approximation, apation by spline functions), numerical entiation and integration, linear difference differential equations (initial-value proband boundary-value problems).
site: Mathematics 200 (or 250) or
of instructor.
Applied Mathematics for Engineers II,
lowing topics will be discussed
ear alg
algebraic equations (theory and num
erical methods for solution), eigenvalue prob b) Linear ordinary differential equations: linear differential equations of order one and two, systems of linear first-order equations,
reduction of higher-order equations to systems of first-order equations, applications.
c) Numerical solution of ordinary differentia equations: one-step methods for a single equa ion and for systems of first-order equations, discussion of stability properties (absolute stability, A-stability) of these methods, ex-
amples of multistep methods for first-order amples of
equations.

Second term:
a) Fourier series and integrals, orthogona functions.
b) Linear partial differential equations of order do; Model problems from mathematical Laplace's and Poisson's equations). c) Elementary probability and statistics.

Students offering Mathematics 328 will not be given credit for Mathematics 300 . equivalent class.

30 Linear and Integer Programming wit Application, lect.: 3 hrs.
Operations Research is the science concerned with the use of mathematical techniques and computers to solve business and economic
problems. One of the most widely used of these techniques is called linear programming. It is echnique for helping management make ptimal decisions when these decisions involve related in variety of ways. In mathematical terms, a linear programming problem can be expressed as one of finding values for the decision variables which will maximize or minimize a linear function of these variables hile, at the same time, satisfying certain In the first part of this class, techniques for solving these problems both analytically and on computer are presented. In addition, com putational methods, for example are simplex and the dual method, are examined in detai nd their efficiencies are compared.
he second part of the class is devoted to the development of particularly efficient tech niques for solving special types of linear he class the problems. As in the first part of he class the use of these techniques on the problems considered include transportation models, network models and multiperiod linea programming models. The final one third of the class is devoted to methods for solving the near programming problem when, in additio above, the variables are restricted to bein bove, the variables are restricted to being
integers. As this is currently an area of very active research by many people in the Operations Research field, the techniques presented
year depending on recent developments.
Throughout the class, application of the variou mathematical techniques to problems of finding be stressed. Specific topics include applications to production scheduling sequencing, capital budgeting decisions, allocation of resources, and optimization in economics at the levels of he firm and the economy
The mathematical prerequisites for this class are ementary. They include only a knowledge basic matrix algebra and an understanding f a vector pace. The main prerequisite is an ability to olve mathematical problems, particularly whe the solution requires a novel or ingeniou approach.

350 Introductory Real Analysis, lect.: 3 hrs
Real analysis is that branch of mathematics tha has grown out of the study of the real number this course will be devoted to a rigourous evelopment of the classical theory of func tions of a real variable. The course will also include many of the important theorems from integral Calculus
Class Outline: Development of the real number system and its properties. Sets, metric spaces and the topology of metric spaces, particularly Euclidean space. Compactness. Sequences a In finite series and power series. Sequences of Functions and pifor Stone-Weierstrass theorem. Functions of severa variables. The inverse function theorem and the implicit function theorem. Line and surface ntegrals. Differential Forms and the theorem theory of and Gauss. An introduction to the -
Students who intend to honour or do graduate work in mathematics, are advised to take this of Math 300 and 350

401 Measure Theory and Integration, lect.: hrs.

In this class we study the theory of integration. The integral of elementary calculus turns out to lack certain desirable continuity" properties definition of the integral. An attempt is made to balance the constructive approach which reats the integral as a limit of approximating sums and the linear functional approach, which treat the integral as a generalized averaging process. A rudmentary nowedge of moder spaces is presuppoed. The theory of integra tion is a careful blend of these theories and hopefully, one gains some knowledge of the interplay of various mathematical structure not Math and 350 .
Per



  theory of the integral in general, some study of the applications of the theory to other areas of mathematical interest will be made

402 Theory of Functions of a Complex Variable, lect.: 2 hrs.

This is a first class in the theory of functions of a complex variable. In addition to having an elegant logical structure, the subject has many
applications both in such fields of pure mathematics as real variable analysis and in such applied fields as physics and engineering, for
example in electrical engineering, fluid flow and heat conduction.
The class studies the differential and integral calculus in the complex domain. It starts with
the basic definitions and properties of complex the basic definitions and properties of complex
numbers and studies the theory of functions of numbers and studies the theory of functions of
a complex variable as developed by d'Alembert, Euler, Gauss, Cauchy, Riemann, Weierstrass and others.
Some familiar functions are extended to the complex plane and used to illustrate the properties of more general functions.
In the more analytic approach of Cauchy and Weierstrass we examine the properties of
analytic (i.e. differentiable) functions. In particular we obtain the integral theorem and formulae of Cauchy and Taylor's development of a function as an infinite series (power series).
Also, we consider the approach of Riemann, representing the complex numbers (together
with an ideal number $\infty$ ) as a sphere, studying the geometric properties of complex functions and generalizing the complex plane to Riemann surfaces to study many-valued functions.
Applications considered include using the
theory of residues to evaluate real integrals. The theory of residues to evaluate real integrals. The
theory is also applied to the study of harmonic functions, or potential functions.

Topics include: topology of the complex plane, integration, analytic functions. Cauchy's theorem, elementary functions, maximum
modulus theorem, conformal mapping, power series, analytic continuation, Riemann surfaces, Laurent series, theory of residues, meromorphic functions, normal families, Riemann mapping theorem, harmonic functions. Prerequisite: A knowledge of real variable analysis, preferably to the level of Mathematics
300 .

403 Advanced Modern Algebra, lect.: 2 hrs.
This class will take up topics in modern algebra beyond the level of Mathematics 303. The
structure of groups, rings, modules, sums, products, coproducts, tensor products, direct and inverse limits shall be formulated and studied in the language of Universal Algebra and Category Theory

## 405 Introduction to Algebraic Geometry, (not

 fered in 1973-74)Introduction to the basic concepts of algebrai geometry, starting from the classical point of done today Many concrete exampeometry is studied. Some topics are: irreducible algebrai sets, the Zariski topology, affine varieties, pre varieties, dimension, spec, affine schemes, pre schemes.
Text: M
Text: Mumford's Introduction to Algebraic
406 Statistical Inference, lect.: 2 hrs.
Sampling statistics are generally used to obtain information concerning the known group character of the population. Such generaliza 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 inference and to calculate the risk of error in those be derived regarding these inferences. Treat ment will be of a mathematical nature. Stu dents will be able to apply statistics compe tently in such fields as the social sciences, biological sciences and medical sciences. Afte this class, every branch of statistics will be ope for further study

The topics covered will include the following point estimation, consistent, sufficient, effici-
ent and unbiased parameters, method of maxi mum likelihood, method of least square method of moments, method of minimum $\mathrm{x}^{2}$, estimation, minimax and Baye's estimation, Neyman-Pearson's lemma composite hypotheses, goodness of fit tests, likelihood ratio tests, critical region, locally most powerful tests, nonparametric tests.

410 Decision Theory and Theory of Games, lect.: 2 hrs. (not offered in 1973-74)
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 extended this principle to all statistical problems.
Wald's 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. Chess and bridge are examples of this
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 rule decision rules, and testing as aspects rules, heory, rectangular games, games in
forms, games with infinitely many continuous games, separable and games, zero sum and non zero sum games.
Prerequis

4120
hrs.
Differential Equation
Ordinary differential equation complex domains. Successive App Ascoli-Arzela Theorem, existence
entiability of solutions. Linear constant and periodic coefficients. singular points. Poincaré Bendixs perturbation theory, Sturm-Liouvil) and asymptotic expansions. Appli Prerequisite: Consent of the instruc

413 Ring Theory, lect.: 2 hrs.
Structure of associative Grothendieck's functional rep ommutative rings. Primary deco Wedderburn theorem.
Prerequisite: Math 303 and consen structor.
414 Functional Analysis, lect.: 2 hrs.
As in the case of linear algebra, object of study is vector spaces but
inear algebra is devoted almost enti tudy of finite dimensional spaces, nalyssis is concerned with infinite $d$ paces. The chief examples of such space of all continuous functions the interval $[0,1]$, and it is from thi the name functional analysis comes. inear algebra and mappings whi importance are the linear ones. Un
algebra, however, the notion of distan crucial role, for example, in the functa mentioned above the distance bet functions $f$ and $g$ is given by sup $/ f(x)$ $\mathrm{x} \in[0,1]$, and hence the mappings sudied in functional analysis are inuous linear mappings.

Thus, functional analysis brings gebra, analysis and topology and $m$ interest lies in the richness of the mat structures involved and the interplay for example, the algebraic and the topology in the class, all that is developed at the beginning.

## Class Outlines

a) Topological introduction - mainl to metric spaces.
Vector spaces with a distance deri norm" inner product, i.e. Hilbert sp ions from a normed vector space to Classes in Computer Science are offered by
personnel of the Nova Scotia Technical College These classes are accepted for credit by both .S.T.C. and Dahousie. The following will b

240 Introduction to Computer Science, lect.:

be pointed out that in (c) and (e) not continuous linear functions studied tally" but the space of "all" of them is bject of study. nuous linear functions from a normed sometimes given the name "special and contains the theory of eigenvalues onalization of matrices.
site: The indispensable requirements standing this class are a thorough
duction to Partial Differential Equa not offered in 1973-74).
on, study and solution of differential of applied mathematics. Hilbert paration of variables and Sturmtheory. Green's functions, eigenfunc and Laplace transforms. Applications ems in physics, chemistry and 204 and 312 or the consent of
mal Contro. Theory, Methods and
3 hrs. (not offered in
retraces the historical path in the optimal solutions using techniques
differential calculus. During the firs calculus of variations will be studied articular emphasis on the sufficient ons for optimality. The effects that this
had on the developments in analysis can by reading some of the earlier papers of During the second term the class will e modern treatment of optimality using essary conditions from optimal contro
Finally these theories will he inally these theories will be applied to problems such as economic growth
inventory control, regulators in inventory control, regulators in
is or electronics, as well as to the problems in geometry which gave rise sole topic.

Iath 300 (or 350) or consent of

Texts: L. C. Young, Calculus of
and Optimal Control Theory; R and R. Kalaba, Trends in Modern Theory.

Computer Science
rens, Professor (N.S.T.C.)
e, Assistant Professor (N.S.T.C.)
erlich, Lecturer (N.S T. C.) Comprehensive Fortran class with problems and pplications. History of computation, number systems, coding. Description of computer sys mems: gery peripherals. Introduction to machine codes with exercises in assembler programming Data storage and elementary sorting. Applic tion programs. Introductions to high-level languages: Algol, COBOL, APL, simulation languages. Interactive programming in Basi Applications in num tion.
introducto: Mathematics 100 or 110 . An computers.

335 Data Processing, lect.: 3 hrs.
Review of Fortran. Basic concepts of data. Arrays, lists and strings. Storage allocation. and sorting. Report generators. Cobol pro gramming with applications to payrolls, ac counting, sales analysis, business statistics and inventory control. Simulation of industrial Processes. Management games. Prereq
206.

340 Computer Science, lect.: 3 hrs.
Algorithms. Basic concepts, single and multi precision arithmetic. Implementation of mathe tive algorithms. Random number generation and transformations.

Data structures. Lists, strings, arrays and trees, Storage media and allocation. Symbol tables Up-dating and searching. Core sorting

Computer architecture. Operating system Batch processing, multi-programming and time sharing.
Introduction to selected advanced topics: Introduction to selected advanced topics: ern recognition and picture processing. ElePrerequisite: Mathematics 240.

421 Introduction to Partial Differential Equa tions
Classification, study and solution of differential equations of applied mathematics. Hilbert space, separation of variables and Sturm-
Liouville theory. Green's functions, eigenfunction expansions and generalized solutions.
Fourier and Laplace transforms. Applications
to some problems in physics, chemistry and engineering.
rerequisites: 2045 and 3125 or the consent of he instructor.

430 Optimal Control: Theory, Methods and Applications, lect.: 3 hrs.
This class retraces the historical path in the
search for optimal solutions using techniques from the differential calculus. During the first
term the calculus of variations will be studied with particular emphasis on the sufficient conditions for optimality. The effects that this search had on the developments in analysis can be seen by reading some of the earlier papers of this field. During the second term the class will study the modern treatment of optimality using
the necessary conditions from optimal control theory. Finally these theories will be applied to a variety of problems such as economic growth theory, inventory control, regulators in mechanics or electronics, as well as to the classical problems in geometry which gave rise to the whole topic.
Prerequisite: $^{\text {Math }}$
rerequisite: Math 300 (or 350) or consent of instructo
Suggested texts: L. C. Young Calculus of
Variations and Optimal Control Theory; R Bariations and Optimal Control Theory; R.
Bellman and R. Kalaba Trends in Modern Bellman and R.
Control Theory.

## Mediaeval Studies

The period commonly called the Middle Ages (approximately A.D. 400-1500) offers a unique opportunity to study Western culture as
whole. Indeed, any attempt to study a part of this period in isolation leads to a conviction that such an investigation can never be satisfying and that the walls between disciplines must be broken down and the literature seen in relation to the philosophy, the philosophy in
relation to the history and the history in relation to the history, and the history in
relation to the languages. No matter what the vernacular tongue of any geographical area, there was one common language throughout Europe and one church, and the study of these leads inevitably to a consideration of paleography, art, architecture and music.

The field is a very large one and could become a fascinating and rewarding area for a certain type of student - the one who likes to immerse himself in his work and who feels that knowledge in separate pigeon-holes because his 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

The professors currently involved in this pro gramme are: R. Crouse, J. Doull, E. Segelberg (lassics); R. Dawson, H. Moran (English); H.
(German); R. Haines (History); J. Aitchison
(Political Science). A student who is interested in entering the programme in Mediaeval Studie should speak to one of these faculty members who will then refer him to the Administrati Committee for the planning of his course.

## Structure

The Honours degree in Mediaeval Studies must have a major field consisting of 9 classes,
selected from those with Mediaeval Studies selected from those with Mediaeval Studies of: a literature, history, philosophy and Latin. other classes will depend on the individual be represented. The minor field may be varie to suit the taste of the student: he may wish to continue into later periods in his favourite discipline or he may wish to acquire another anguage to help him in his work. No class in he minor field may be from the Mediaeval
tudies group. The four classes not in the majo field may be widely scattered: one or more of hem may be 100 -level prerequisites which were oot taken in the first year but which may be ecessary for later mediaeval work, e.g., intro

Some sample programmes which might be followed are:

Literary: English. Major: Med. Stud. 201, 202, 03, 204, 211, 301, 302, 401, 261. Minor: classes in English, possibly English 251 and
252. Four additionial classes: possibly Philosophy in Literature (Phil. 270), History of England (Hist. 210), German for Beginner (German 100), and Intermediate German German 200)
Literary: non-English. Major: Med. Stud. 211 212, 221, 222, 204, 301, 303, 261, 402. Minor: German. Four additional classes: possibly Latin 100, Philosophy 100, plus another Latin and nother Philosophy
Historical. Major: Med. Stud. 301, 302, 303 304, 311, 401, 414, 202, 261. Minor: History introductory and intermediate Latin and two French.
Philosophical. Major: Med. Stud. 402, 401 403, 414, 301, 302, 204, 211, 261. Mino philosophy. Four additional classes.
tasses

The classes available from which a mediaeval grouping may be formed are given below. Some of them are on an ad hoc basis, depending o numbering of the classes reflects subject and department, rather than order of difficulty or of priority.

201 History of the English Language (Eng. 201)

202 Old English (Eng. 253)
203 Tales from Chaucer \& Malory (Eng. 218)
204 Middle English (Eng. 351)
211 Intro. to French Lang., and Lit. of the Middle Ages (French 430
212 Intro. to Provençal Lang. \& Lit. of the Middle Ages

221 Middle High German
222 Midle High German II (1973-74)
261 Intro. to Mediaeval Latin
262 Intro. to Mediaeval Greek
301 Mediaeval Life \& Thought (Hist. 199/5)
302 Mediaeval Europe (Hist. 200)
303 Mediaeval Civilization (Hist. 300)
304 Roman History (Classics 223)
311 Palaeography (Hist. 501)
401 Mediaeval Philosophy (Classics 240)

## Latin Philosophical Texts (Classics 201)

403 Seminar on the Church Fathers (Classi 464)
(Clistory of the Interpretation of Aristotle (Classics 463)
14 Mediaeval Political Philosophy (Poli. Sci, 207)

It is possible that in the future some of the following may be added to the programme though they are not offered at present:

Intro. to Med. Spanish Lang. \& Lit.
Old English Archaeology
Old Icelandic
Byzantine and Latin Liturgiology
Microbiology see Biology

## Music

## Asociare Professors

.D. Byham (Music History; Piano) man**
J. M. Gayfer (Chair

Gary Karr (String Bass)
D. F. Wilson (Music History, Conducting)

Assistant Professors
D.M. Farrell (Music Theory) H. P. May (Voice) A. G. Scott-Savage (Voice)** J. E. Sorenson (Music History)** J. S. Tittle (Music Theory)

Special Instructors* N. Babineau (String Class) M. Ball (Percussion) J. C. Doane (Brass Class; Classroo ments) J. Grew (Organ)
A. Hoffman (Tuba)
P. Murray (Chorae)
S. Pederson (Flute) E. Raum (Oboe) R. Raum (Trombone, Brass Ensemble) J. Stern (Trumpet)

## Special Appointment

## Karr-Lewis Duo, Artists in Residence

 Associate Professor Gary Karr (String Mr. David Harmon Lewis (Harpsichord)*Additional Instructors to be appointed **Members of the Executive Commi July $1,1973$.
Music, like science and other areas of has become an immense field of sp comprehensive musical education.

Similarly, music making in our cont society demands more than a mere command of voice or an instrument. For
reason, the music curriculum includes all essential elements of musical training theory, music history, performance.

Included in this curriculum is specialist tion in all instruments and singing, a emphasis in the performance of ensemble and in recital, and professiona ing in both instrumental and vocal musi Bachelor of Music Education programm

## Concerts

Halifax is one of the centres of musical activit in Canada and many concerts and recita
scheduled throughout the year. Dal scheduled throughout the year.
University sponsors a series of perform internationally known artists and ense well as recitals and concerts by the De of Music Faculty, students and ensembl Atlantic Symphony presents its concerts in the new Dalhousie Univer
Centre.

## Ensembles

The Department of Music sponsors a
large and small ensembles, both vo instrumental, that are open to all participate in a music ensemble should the Department of Music.

Year III
Year III 12. Music 300
12. Music 300
14. Music 330 (General Music concentration) or Music 332 (Instrumental Music concentration)
15.
15. Secondary Studies* and Music 335

Year IV
16. Major Applied Study and Ensembles
17. Secondary Studies*
18. Music 435 or Music 436
19. Music 330 (General Music concentration) or concentration)
20. Music 420A and Music Elective (B)
21. General Principles of Education (Education 401)
*The number, level and content of Secondary Studies are determined by the student's previous training and area of concentration.

General B.A. in Music
Year I

1. Major Applied Study with Ensembles 3.5. Arts elective

Year II
6. Major Applied Study and Ensembles

## 7. Music 210 <br> 8-10. Arts electi

## Year III

11. Music 310
12-13. Music electives ( 200 level or above) 14-15. Arts electives
Students wishing to take music as a secondary area of concentration may elect a minimum of 201, 210, 300, 301, 310.
A. with Honours in Music (major concentra tion)
Same as for General B.A. in music.
Years II, III, IV
Eight classes in music, 200 level or above including Music 300,3 , tudy and ensembles; ears of major applied study and ensemional
two classes in a minor field; five additiona classes, normally in subjects other than the major and minor fields.
Students should consult with the Department of Music for programmes in combined or of Music for programs.

Programmes of Study
Music History and Literature
100 Introduction to Musical Styles, lect.: 3 hrs.
A comprehensive view of the present musics of
the world and of the history of music in Western culture, with attention given to de-
velopments in North America. Styles, forms and composers are introduced through element ary analysis and guided listening to recorded and live performances of music. Social aesthetic and philosophicall to students whose
are considered. Open only major field is music.

105 Introduction to Music, lect.: 3 hr
Designed for students taking a General degree course in a field other than music. An
introduction to the present musics of the world, with emphasis on that of our Western heritage. Special consideration is given to the listening experience with a view toward de veloping the capacity for understanding what being heard. The development or Western is musical concerns, including jazz and musics of non-Western cultures.

201 The Contemporary Scene: Rock, Its Roo and Relatives, lect.: 3 hrs.
study of the music of today, including: istory of pop music, jazz and blues; the evolution of rock; musical syntheses and cross cultural influences; some technical, aesthetic and sociological considerations regarding contemporary music, popular and otherwise. Prerequisite: Music 100 or 105 and written

300 History of Music, lect.: 3 hrs
detailed study of the history of music ncluding the analysis of works of all historic periods.
of the instr: Music 100 and 310 or permission

## tion, lect.: 3 hrs.

the Western

For students taking a general degree course Available also to music majors, for whom an additional requirement is the submission of a paper. The class is designed to approach an understanding of folk and non-Western music by means of recordings, films, live demonstr d required readings.

400 Music History, seminar: 2 hrs.
A study of selected topics in music history and including individual research projects. Prerequisites: Music 300 and 310 or permission of the instructor.

## Music Theory

210A First-Year Theory (Modal Polyphony), lect.: 2 hrs., lab.: 3 hrs.

Rudiments of music plus two- and three-part writing in strict Renaissance style correlated pploratory koyb sight-sin
.



, king application for admission to the , music applicants should requ Depar helor of Music Education is a four-yey development of musicianship and pro umental music. Students completing lor of Music Education degree receive otia Teacher's Certificate (Class 5).
schools of the cities of Halifax, , and hatran of music teachers east of A close relationship has been
between these schools and DalWhich will give students an opportunity riety of general music and instrumental
der to ensure an adequate level of lization within the field of music educachelor of Music Education programme: Music and Instrumental Music. StuWhose background is a keyboard instru
voice will normally elect the General concentration; students whose majo nd, or percussion will normally elect trumental Music concentration. These of concentration are not mutually ex-
Depending on their qualifications and Depending on their qualifications and
students will be encouraged to parin both areas of concentration.

Applied Study and Ensembles

Applied Study and Ensembles oom Observation and Secondary Stu
cational Psychology (Education 406) s elective in the Department of Music mu Arts and Science and must satisfy requirements in the Department mission beparo dep Faculty members of the Depart usic, in which the student is expecte trate proficiency as an instrum erformer. Information regarding the evels of proficiency may be obtaine Department of Music. Early apple audition is advised

Prerequisite: Non-majors: written permission of
210B First-Year Theory (Elementary Harmony), lect.: 2 hrs.; lab.: 3 hrs.
Four-part writing including the diatonic triads and introductory modulation; sight-singing, ear training and keyboard
Prerequisite: 210A.

310A Second-Year Theory (Advanced Har mony), lect.: 2 hrs.; lab.: 3 hrs.

Survey of altered and complex chords, Survey of altered and complex chords,
advanced modulation, and idiomatic figurations; chromatic sight-singing, four-part dictation and keyboard harmony for analysis.
Prerequisite: 210B.
310B Second-Year Theory (Tonal Coun terpoint), lect.: 2 hrs.; lab.: 3 hrs.

Examination of traditional contrapuntal techniques applied to 18th- and 19th-century counterpoint; non-tonal singing, advanced ictation, and score reading at the keyboard. rerequisite: 310A
hrs.
study of twentieth-century compositional techniques, including those of the recen skills, sight-singing and ear triaining.
Prerequisite: Music 310 .
115 Seminar in Theory and Composition seminar: 2 hrs
he study and analysis of representative ex amples of music of various periods with regard
to both form and harmonic and contrapuntal to both form and harmonic and contrapuntal
styles. Students will be required to write sample compositions in each of the styles studied. Prerequisite: Music 300 and 310 .

420A Orchestration, lect.: 3 hrs.
The study of the properties of the individual instruments of the orchestra and methods of oll orchestra.

## Music Education

Open only to students in Music Education)
235 Classroom Observation
Supervised observation of selected classroom tituations (2 credit hours).
330 Elementary Methods, lect.: 3 hr
A study of classroom techniques and materials for teaching using the Threshold of Music method and other systems currently in use a the elementary level; the role of the music
consultant in elementary education; profes-
sional relationships; programme development. Prerequisites: Music 100 and 310 . Students should be able to deal with the musical problems encountered in vocal music in the public schools. They should also be able to sing in tune, and with good tone, and read vocal music, and should be familiar with the histor-
ical periods and styles of music.
,
mental Methods, lect.: 3 hrs
A study of the techniques for teaching instrumental music, band and orchestra administration, rehearsal and conducting techniques,
library management, programme building and class lessons. Students will be expected to compose and arrange music for beginning instrumental ensembles.

335 Practice Teaching (General Music)
Supervised
credit hrs.).
430 Junior-Senior 3 hrs.

All students who enrol in a major app annually, and in master classes as addition, a formal recital is reses as sched terminal year of study.

Piano; 150, 250, 350, 450.
Harpsichord; 151, 251, 351, 451.
Organ; 152, 252, 352, 452
Voice; 153,253, 353, 453.
Violin; 155, 255, 355, 455
Vola; 156, 256, 356, 456.
Cello; 157, 257, 357, 457.
Bass; 158, 258, 358, 458.
Flute; 160, 260, 360, 460.
Oboe; 161, 261, 361, 461.
Clarinet; 162, 262, 362, 462.
Saxophone; 163, 263, 363, 463

## Bassoon; 164, 264, 364, 46

Trumpet; 165, 265, 365, 465.
French Horn; 166, 266, 366, 466.
Trombone; 167, 267, 367, 467.
Tuba; 168, 268, 368, 468
Percussion; 169, 269, 369, 469

Ensemble; 173, 273, 373, 473. (1 credit ho
Ensemble participation as designated by the Department is a requirement of all studen whose area of concentration is (Chorale, Band and Orchestra), students will be expected to participate in appropriate ensembles (Vocal Ensemble, Wind En String Ensemble, Piano Ensemble, and String Ense
available).

Dalhousie Choral
Conductor, Mr. Paul Murray. Members include non-majors by consent of

Dalhousie Band:
Conductor, Dr. James Gayfer. Membership
include non-majors by consent of the
ductor.

## Dalhousie Orchestra:

Conductor, Dr. James Gayfer. Membership include non-majors by consent of the ductor.

Chamber Singers:
Prof. A. G. Scot
or, Prof. A. G. Scott-Savage
housie Chamber Singers is a selective for the study and performance of la" singing and the development of musicianship within a selected smal . The repertoire ranges from pre to contemporary compositions. jors or permission of instructor.
pplied Study (2 credit hours)
hour of private instruction per week
only to students whose area of concentra only
music.
uisite:
site: Permission of the Department of Depending on a student's programme of additional fee may be assessed.
$180,280,380,480$.
ord; 181, 281, 381, 481.
182, 282, 382, 482.
83, 283, 383, 483.
$185,285,385,485$.
186, 286, 386, 486.
87, 287, 387, 487.
88, 288, 388, 488.
$190,290,390,490$.
91, 291, 391, 491.
; 192, 292, 392, 492.
e; 193, 293, 393, 493.
; 194, 294, 394, 494.
et; 195, 295, 395, 495.
Horn; 196, 296, 396, 496
one; 197, 297, 397, 497.
198, 298, 398, 498.
ion; 199, 299, 399, 499.
ondary Studies
ases or private instruction for students in the
chelor of Music Education programme. The
cific classes and their sequence will be Pecific classes and their sequence will be
eeermined by the student's major applied $y$ and the area of concentration. (2 credit 8. each)
pera Workshop
Workshop students study the basic lamentals of dramatic interpretation and ing of the operatic role, also the analysis of verformer in relation to stage ensemble and
he audience. Consideration is given to the acting styles of major historical periods and to he characteristics and influence of period
costume on stage movement in the standard repertoire. There are exercises in projection eye technique, mimicry, gesture, and body movements, etc. Courses are open to qualified students of other
the instructors.

240,340 , Voice Class
241, 341, 441 Piano Skills
244, 344, 444 String Clas
Class instruction on stringed instruments using he Bornoff method: 244, Violin; 344, Cello; 444, Viola and Bass.

246 Basic Conducting Skills
Prerequisite: Music 210 A and B .
343 Choral Techniques and Repertoire
Prerequisite: Music 310A and B, 153, 183, or

345 Brass Class
346 Instrumental Conducting
348 Classroom Instruments
440B Vocal Pedagogy
May be registered for only with prior consent the Department of Music

445B Piano Pedagogy
May be registered for only with prior consen of the Department of Music.

446 Woodwind Class
447 Percussion Class
448 Recorder Class

## Oceanography

Oceanography is a broad, inter-disciplinary science which includes studies of tides and currents, the chemistry of sea water, plants and animals that live in he sea, and ocean bottom Career oceanographers are presently employed in Canada in a few universities and in various federal laboratories that are engaged in both basic research and applied problems which meet a national need, such as fisheries investigations,
exploration for offshore mineral resources, and studies of ice in navigable waters.

A good background in basic science is necessary prerequisite, followed by specialization in oceanography at the graduate level.
Dalhousie is one of three Canadian universities offering M.Sc. and Ph.D. programmes in this subject. However, properly prepared underdepartments by consent of in the instructors.

Studies. will be given to r
system.

## Philosophy

D. Braybrooke
F. H. Page
I. A. MacLenna
R. H. Vingoe
R. M. Martin
A. Rosenberg
graduates are permitted to take one or more of the classes as electives. There are introductory classes which survey the entire field and advanced classes in each of the major specialties - physical and chemical oceanography, marine biology, and marine geology and geophysics. in the Calendar of the Faculty of Graduate

In addition, one undergraduate class is offered
200 Introduction to Oceanography, lect.: 3 hrs., R. O. Fournier.

This class will attempt to survey the field of Oceanography in general and to show how the oceans, which account for more than $70 \%$ of the earth's surface, function as a dominant environmental foree. nadation, consideration

This course is designed to give the student a background or feeling for the ocean, what oceanography is, and what oceanographers do. It is not a good "background to science"
course, since little feeling will be obtained for course,
scientific techniques which would otherwise be acquired in a laboratory course. Most of the material which will be covered will be descriptive rather than basic, inasmuch as it is impossible in the time allowed and the material covered to also teach the basic
sciences.
Prerequisite: Any first year science course.
A. H. Armstrong (Dept of Classic
J. A. Doull (Dept. of Classics)
R. P. Puccetti (Chairman)

Associate Professors
R. D. Crouse (Dept. of Classics)

Assistant Professors
S. A. M. Burns
R. M. Campbell
W.F. Hare (Dept. of Education)

Unlike some subjects, philosophy is not taught in high school. The new student can therefo in high school. The new student can therefore
safely assume that no previous knowledge is required as a prerequisite for the introductory class, Philosophy 100. Philosophy has con cerned itself in the past with a number of aditional questions. For example, are men in ny sense free, or are they merely conditioned
and determined by their environment, heredity, etc. Again, have men souls which might conceivably survive death, or is individual life

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merely an emergent quality of matter doomed vanish with the dissolution of the body?

Then there are questions about the nature of knowledge. Are there some truths which can be
proven to be true without proven to be true without relying on ex-
perience? Or is all our knowledge empirical? perience? Or is all our knowledge empirical?
Does science require certain principles, like causality, which are more than inductive generalizations from experience? Then there is philosophical theology. Can any reasonable proof be given of God's existence? Finally, there are many problems of an ethical kind. For
example, is there an absolute morality or are all example, is there an absolute morality or are all
ethical standards relative to the society in which they are practised, and the time when they are practised? Related to these questions are certain existentialist questions as to the meaning and purpose of life. How does one deal
with the problematic nature of human ex with the problematic nature of human ex-
istence?

The student may already realize that no final dogmatic answer can be given to the above questions. Nor need he be expected to endure a set of formal lectures. It is the aim of all classes
of philosophy to proceed by class discussion. of philosophy to proceed by class discussion.
As a result of continually discussing the above questions, and many others like them the student will acquire a certain philosophical technique, which will be of great benefit to him, whatever subject he may decide to
specialize in. specialize in.

The Arrangement of the Classes
Students who are interested in taking a begin-
ning class in philosophy may take either ning class in philosophy may take either Philosophy 100 or any class numbered in the
200's. These classes have no prerequisites and are open to freshmen and anyone else, with or wakes it possible for students ing. This fact dents in the first year of their university study, to begin work in philosophy in different ways, chosen to suit their present interests. However, students intending to take 300-level classes
should note that for these classes one or more of Philosophy 100 or Philososhy $200,201,202$ (the classes in logic) are prerequisites. The $400-$ level classes are normally open only to advanced students in philosophy.

Of the classes open to beginners, Philosophy 100 gives a comprehensive introduction to philosophy are represented in the topics treated and the class is divided into sections small
enough to give a good deal of practice enough to give a good deal of practice, oral as
well as written, in basic philosophical skill of analysis and argumentation. Some attention is given to important philosophical authors of the past, both ancient and modern; but Philosophy 100 is not a class in the history of philosophy. Philosophy 230 is; and students primarily
interested in history and the history of ideas interested in history and the history of ideas
may find this class the most inviting way to may find this class the most inviting way to 202 , the classes in logic, are in one sense narrow by comparison, being devoted to one rather
sharply defined branch of philosophy; however,
skill in this branch is an indispensable advantage in ase advaced work in philosophy - so these classes, too, can be looked uponsics only as introductions to philosophy, but also as direct entry-routes into the central concerns of the subject. The other 200-level classes are both specialized and less central. However, they are
addressed to interests that are uppermost in the addressed to interests that are uppermost in the
minds of many students: religion, treated in two classes on the philosophy of religion, Philosophy 220 and 225 ; and questions, very much like some of those raised by religion, about the meaning of life and the present condition of man, treated in Philosophy 217
(on the Continental tradition of philosophy on the Continental tradition of philosophy
known as "existentialism") and Philosophy 270 (on these questions and related ethical questions as they figure in great literature of the
19 th and 20 th centuries); and, finally, funda19th and 20 th centuries); and, finally, fundamental questions about the meaning and purpo
218.

## Degree Programme

General B.A. in Philosophy
Students are strongly urged to take at least one
of Philosophy $200,201,202,305$ of Philosophy $200,201,202,305$, and at least
one Philosophy $230,310,319,320,335$ All students proposing to take a General degree in philosophy should arrange their course in consultation with Professor I. A. MacLennan.
B.A. With Honours in Philosophy

Students intending to specialize in Philosophy hould 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 classes in a minor subject approved by the Department and four than philosophy. The ten philosophy classes in an honours course must include: Philososhy 200 (or 201 or 202), 230, 305, 310, 320 and ne $400-$-evel class. Philosophy 100 may be ncluded in the ten classes of the honours course, if it was taken at the beginning of the 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 philoso phy should arrange their course in consultation

Combined Honours
There are several combined honours pro grammes:
Philosophy and Economic
Philosophy and English
Philosophy and Psy chology
Philosophy and Sociology
or other combinations that can be arranged.
Students interested in taking any of these combined honours programmes should consult with Professor I. A. MacLennan.

100 An Introduction to Philosophy, 3 discus
sion meetings weekly, D. Braybrooke Burns, W. F. Hare, R. P. Pueccett Students in this class will pursue in four topics, chosen from four of branches of philosophy, and treated
illustrate illustrate basic principles of philosop
lysis, as well as some lysis, as well as some of the major
contributions to philosophy contributions to philosophy. The fo
taken up in an order varying taken up in
sections, are:
(1) arguments for and against the
God; God;
(2)
(2) ethics and political obligation;
(3) the mind-body problem (3) the mind-body problem;

The professors assigned to specialize on one or another of the and every section will be taught, in
four different professors, four different professors, as the sectio
from one topic to another. Plato from one topic to another. Plato,
Aquinas, Descartes, and Hume Aquinas, Descartes, and Hume a
historical authors to be studied.

The Department of Philosophy has as extraordinarily large proportion of fac to this class so that it can be carried on
in small sections limited each to 30 s in small sections limited each to 30
even so, the number of sections, total enrolment in the class, must be Only students who value the chance tinuous discussion in a small group enough to commit themselves to co

200 ${ }_{\text {MacLennan. }}^{200}$ Symbo
Whenever we draw conclusions from in such fields as mathematics, physics,
ing or economics (not to ing or economics (not to mention the
sciences), we are using a simple system, which it is the aim of this $c$ develop. By taking a course in logic the should have a better understanding of may derive the correct conclusions
scientific hypotheses, scientific hypotheses. One easy way
standing the nature of inference is to simple, artificial language, in which the tive of one formula from another is to playing a game with pencil and pap aim of Philosophy 200 is to cre language, and to discover its most
properties. Although symbolic logic coperties. Although symbolic logic in a natural language, the emphasis w the systems themselves. Because many find this kind of study to be quite new academic career, great care will be presenting the material, and in additio
will be five assignments, which, when hould lead to a fuller understanding subject.

The student should realize that the re classical two-valued logic to classic
matics is explored in Philosophy 403. Text: MacLennan, In Philosophy 403. Games (vol.1).

## ical Forms of Argument ans. 3 hrs.; M. Campbell.

ss teaches the application of symbolic arguments expressed in natural languin philosophy, science, ethics, law and
Its principal aim is to develop the Its principal aim is to develop the
capacity to analyze the logical strucsuch arguments so that he can better heir validity. Unlike Philosophy 202, deals extensively with formal mani-
within a logical system. Unlike , within a logical system. Unlike hy 200 , symbolic logic will not be
or its own sake, or for its relevance to dations of mathematics. No previous ance with symbolic logic is presupposed.

Principles of Reasoning, discussions M. Martin.
a class in applied practical logic. logic techniques will be avoided as far be; instead, attention will be paid to ss of reasoning as exemplified in good real arguments, definitions, explana
tc. The aim is the development of es to produce clear and valid reasoning istinguish this from its opposite.

osophy and Psychoanalysi, n: 2 hrs.; R. M. Campbell.

of this class are: (1) to analyze some philosophical issues regarding ality in the context of psychoanalytic (2) to examine the empirical foundahealth functions in the theory as health functions in the theory as a ve concept. There will be no attempt to No previous acquaintance with philopsychoanalysis is presupposed.
istentialism, lect.: 2 hrs.; I. A. Mac
of this class is to study the works of ajor philosophers in the existentialist . The first term and part of the second devoted to the works of Kierkegard sche. The remaining time will then be
more or less equally to the works of more or less
nd Heidegger.
losophy of Education, lect.: 2 hrs.; , Same as Education 402 Section 3.
the first term an attempt is made to some of the crucial concepts in educa-
heory. What is teaching, and is it distinct aining, conditioning and indoctrination? slogans in educational theory, e.g. "We hildren not subjects", and "there's no g without learning", are carefully ex-
How is education distinct from teachis it possible to identify criteria which ss must satisfy if it is to be considered onal? Is there any conceptual con between the idea of teaching and that
ority?

These are the kinds of issues discussed though he specific direction depends a good deal on the class.
b) In the second term the class focuses on philosophical issues concerring curriculum. For example: Is it meaningful/useful to base a erests? What is involved in the claim that curriculum should be relevant? Are there any ducational arguments in favour of a broa goals such as creativity, mental health? An attempt is made to demonstrate the importance of analysis of the fundamental concepts in volved in such issues.
20 Philosophy of Religion, lect.: 2 hrs.; F. H. 220 Ph
Page.
n introduction to the philosophy of religion. ince there are many religions, is it possible to dentify anything that is essentially religious. What sorts of evidence would provide good reasons for the belief in a divine being. Is of divine activity, for example in creation and miracle, intelligible? Is it possible to have knowledge of a divine being? Do revelations and religious experiences reveal more than the mental state of the experiencer? Are faith and reason alternatives or correlatives? Is istence of evil and suffering compatible with the existence of a God who is both omnipotent and morally perfect? Does rationality demand that traditional views of the divine be modified, or abandoned? What religious alternatives are there? In considering questions like these the student will encounter many of the issues
around which philosophical discussions revolve. He will also gain some acquaintance with the views of a variety of philosophers, past and present. Hence the class also provides one form of introduction to philosophical study as such.
Readings from an anthology by W. P. Alston and paperbacks by W. C. Smith, Ninian Smart, John Hick and Nelson Pike.
225 Religion and Human Behaviour, lect.: hrs.; F. H. Page.
A study of religion as a form of human experience and behaviour. Can religion be plausibly explained in naturalistic terms, for
example as a social device or as a merely subjective product of human psychology? With what human needs may religious behaviour be behaviour change throughout the life-history of the individual? How are the concepts of development and maturity to be analyzed when applied to religion? How does the moral conscience develop in the individual and how is this related to his religious development? What
is known about the preconditions and consequences of a religious conversion? What part do so-called peak-experiences play in religious development? Are drug-induced states genuinely religious? Are Eastern and Western

304B Topics matics, lect.: 2 hrs.; P. K. Schotch

This course will review some of the main hemes in the foundations of mathematics. The consideration of course will be based upon a Richard and Burali-Fortii etc. Various methods
ligions? ligions? Are there different types of the religious ideal, for example the mystical, pro-
phetic, priestly, intellectual, saintly? An introductory class; no prerequisite.

Readings from Sigmund Freud, G. W. Allpor R. H. Thouless, William James, W. H. Clark, and others.
230 General History of Philosophy, lect: and seminar: 2 hrs.; R. H. Vingoe

The purpose of this class is to help students discover those philosophic traditions which have played a part in moulding western civilisation and still persist in the contemporary attempt will be made to concen trate upon some of the greatest and most influential of western philosophers. Since a general history is apt to degenerate into vague and inaccurate generalisations, students will be asked to present short
papers, outlining and evaluating some parts of a papers, outlining and evaluating some pats of given philosopher's writings.
Texts: B. Russell, History of Western Philoso-
phy, (Allen and Unwin, Ltd., London, 1961); K. E. Eble, R. E. Helbling (eds.), The Intellectual Tradition of the West, Vols. I and II, (Scott, Foresman and Co., Glenview, Illinois
60025, 1967); D. J. O'Connor (ed.) A Critical 60025, 1967); D.J. O'Connor (ed.), A Critical Macmillan Canada Ltd., Toronto, 1964).

270 Philosophy in Literature, lect. with discussion: 2 hrs.; R. M. Martin.
This is an introduction to some issues in philosophy through the reading of some imis 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 tradi-
tions involved. The slass 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 philosoohical ideas. In literary occurrences of phisosophicalial meeting per week there will be optional discussion meetings at various times to be announced during the year. Readings will include short works by Dostoyevski, Melville, Kafka, Beckett, Sartre, Camus, Nietzsche, Hemingway, Peter Weiss, and Brecht.

Note: This class is cross-listed as Comparative that title.








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## may be registered for under

of dealing with these will be discussed, including axiomatic set theory and the theory of
types. The second part of the course will deal with The second part of the course will deal with
Gödel's incompleteness theorems, the existence of unsolvable problems, and their impact upon the various foundational programmes. Prerequisites: Some experience with topics both in mathematics and philosophy while not absolutely required would be helpful to the
student. As a minimum prerequisite - at least one full course in logic taken from either department.

305 Epistemology, lect. with discussion: 2 hrs., P. K. Schotch

An introduction to issues in the theory of knowledge, especially those which cast light on the conceptual aspects of the social and natural sciences. Among the issues normally treated
are: the philosophical analysis of the concept of knowledge: perception andsis of the concept of knowledge (and especially the relation to piricism); the logical problem of induction. ther minds and the relation between psychological and physical language. Questions to be
raised include: Does knowledge have foundations, and if so, is the basis of knowledge to be found exclusively in perceptual experience? Are
any non-deductive inferences justified any non-deductive inferences justified, and
more particularly what ground is there to believe the claims of science if the evidence for these claims is always formally incomplete? What evidential relation obtains between claims about persons' behavior and claims about their Readings will consist mainly of the work of contemporary authors.
Prerequisite: Philosophy 100 or 200 or 201 or 202 and consent of the Department.
310 Ethics, lect. with discussion: 2 hrs.; R. M. Campbell
systematic discussion of traditional topics in noral philosophy: the nature of pleasure and happiness, psychological and ethical egoism, Kant's Categorical Imperative, Hume on mora and justice. The class will consider the relation of these topics to some contemporary pro blems, such as pacifism and the morality of induced abortion Prereq
202.

319 Descartes and the Search for Indubitable Knowledge, seminar: 2 hrs.; R. H. Vingoe.
This seminar will highlight one extremely influential line of thought: philosophers have often sought indubitable knowledge. In this
search Descartes is quite important because his search Descartes is quite important because his
position marks a radical break with ancient and medieval thought and because this break made epistemology the main preoccupation of
modern philosophy. The first half of the class modern philosophy. The first half of the class
will consequently be devoted to Descartes. The second half will range beyond Descartes (e.g.

Hume, Moore, and Ryle) to consider alternative 346 Problems of Mind, seminar: 2 h experience, self-awareness, logic, and common sense. Students will be expected to presen hort papers. Prerequ
202.
Texts:
Texts: R. M. Eaton (ed.), Descartes, Selections, (Charles Scribner's Sons, 1969); J. R. Weinber and K. E. Yandell, Theory of Knowledge (Holt, Rinehart and Winston, 1971).

## 320 The Philosophy of Hume and Kant

 seminar: 2 hrs.; A. Rosenberg.A close study of Hume's Treatise of Human Nature, Book I, and Kant's Critique of Pure Reason, disclosing parallel problems and al-
ternative responses to them in these works. The ternative responses to them in these works. The
class will also consider the accounts of some contemporary commentators, and the relevance of these two classics to present philosophica
concerns concerns. Prere
202.

335 Greek Philosophy from Thales to Aristotle, lect. and discussion: 2 hrs.; S. A. M. Burns.
The beginning of Western philosophy is studied in the Presocratic fragments, major works of Prerequisite: Philosophy 100 or 202.

336 Ancient Philosophy from Aristotle to St Augustine, lect.: 2 hrs.; A. H. Armstrong/J. A. Doull.
This class studies the development of Classical and Patristic thought from Aristotle to St.
Augustine, with concern to explore the manner Augustine, with concern to explore the manner
in which the philosophical achievement of ancient Greece came to form, in the thought of the Church Fathers, the intellectual foundation of European culture. Works most closely considered will be Plato's Timaeus, parts of
Aristotle's Metaphysics, parts of Plotinus Enneads, and St. Augustine's City of God and De Trinitate. Philosophy 100 or 200 or 201 or 202.

338 History of Medieval Philosophy, lect.: 2 hrs.; R. D. Crouse.
A study is made of the development of philosophy in the formative age of European
civilization, with attention political, institutional, literary and theological concerns. The authors studied most closely will Aq Boethius, Anselm of Canterbury, Thomas Aquinas, some thirteenth-century Augustinians
and Averroists, Ockham, and one or more of the Late Medieval Mystics. The class will be conducted partly as a seminar, partly as a course of lectures. 202.

These problems of mind will be explor How are a person's corresponding me physical states related? Is the concep exhausted by descriptions of his mental by descriptions of changes in certain his nervous system? Or does the cone person require reference to a third enti and above his mental and physical sta What kinds of entities might possibly machines do so? Could organic artifast hon-material entities? How are we ecisions about the application of me personal concepts to non-human entit What effects upon traditional problem mind/body relation are indicated by bisection in humans and investigation intelligence, e.g., language-learning panzees and dolphin communication? Prerequisite: Philosophy 100 or 200 202.
Texts: Self-Knowledge and Self-Iden Texts: Self-Knowledge and Self.-Ident
Sydney Shoemaker; recent articles problem of personal identity; Mentali Machines, by Keith Gunderson; The Min Readings in Physiological Psychology, Thomas K. Landauer

347B Freedom and Responsibility discussion: 2 hrs.; W. F. Hare.

The purpose of this class is to
philosophically issues which are sign philosophically issues which are signif many disciplines, such as psychology,
education. For example, what is saying that a person has a responsibility something; And what is a person rea when he asks to be given more responsibil there is a difference here, is it to be ex in terms of the freedom the agent has in ac
But perhaps the possibility is undermine But perhaps the possibility is undermin
arguments which purport to show that a has no freedom to choose his actions? An in what sense can a person be held respa for his actions?
Readings will include recent articles authors as Pennock, Frankena and Har certain papers in Sidney Hook, ed. Deter B. Berofsky, ed. Free Will and Det (Harper and Row, New York, 1966). Prerequisite: Philosophy 100 or 200 or

355A Marxist Theory and Its Upsh World Today, discussion twice weekl D. Braybrooke. See also Political Scien

Social objectives inherited from earlier so thinkers, especially Saint-Simon, inspir phical ideas imparted by Hegel gena some crucial features of overall frame inclination; the analytic apparatus deve
conomists of the British school Ricardo, gave the thought its cutting a critique of standing social arrange-
The class will spend some time identifych of these influences upon Marxist then consider the classical Marxist of capitalism and various attempts, it to developments which Marx appears have anticipated in some important

Marxism as an Alternative Approach in porary Social Science, (to be given ; not given 1973-74), seminar: 2 hrs ybrooke.
ss will discuss the implications for the of politics of contemporary Marxist nics (by Western writers like Baran and
Mandel, and Sherman); the critique of Mandel, and Sherman); the critique of list culture developed by philosophers Sartre's use of Marxism as a metho y for social science.
uisite: 355 A or equivalent acquaintance e works of Marx and their influence.

Philosophy of History, (1973-74 and tive years), seminar: 2 hrs.; D. Bray-
philosophy of history has both an ancient hysical tradition and a much more recent ical one. Both will be studied in this class,
netaphysical one by means of Karl metaphysical one by means of Karl
h's Meaning in History, and the analytical y use of A. C. Danto's Analytical sophy of History. Some attention will also
en to Sir Karl Popper's works The Poverty en to Sir Karl Popper's works The Poverty
storicism and The Open Society and Its ies, which deal with both traditions.
uisite: Philosophy 100 or another beg class in philosophy; or the permission instructor. A class or classes in history urse desirable as preparation.

Topics in the Philosophy of Physics,
ourse will deal with certain basic prob-
in the foundations of physics and the al sciences in general. Topics to be include the character and interrelation Iization and appraisal; the analysis of the such concepts as causality and deter$n$ in various scientific contexts, e.g.
um mechanics, classical mechanics, etc.
quisite: One full course in philosophy
quisite: One full course in philosophy
dhe the 100 level or one full course in s, or consent of instructor.

53 Plilosophy of Science and Experimental ology, seminar: 2 hrs.; A. Rosenberg, W.
issues of methodological and conissues in experimental psychology.

Topics treated include the character of explana tions, general statements, theories and theoretical entities in empirical psychology, as well as particular issues in current research programmes. concept-formation in non-humans Readings from the works of contemporary psychologists and philosophers. Prerequisite: One full course in philosophy or psychology beyond the 100 level, or consent of instructor.

385 Metaphysics, lect. and seminar: 2 hrs.; S

## A. M. Burns.

This class will study some primary philosophical questions about the nature of substance and change, space and time, cause and effect, Prerequisite: Philosophy 100 or 200 or 201 or 202.

403 Advaced Symbolic Logic, lect: 3 hrs . 1 A. MacLennan.

This class is a continuation of the work done in Philosophy 200 and 201. The main purpose of the course is to show how modern symbolic
logic enables us to provide formal proofs of the basic formulas of classical mathematics. The concept of proof plays an exceedingly important part in mathematics, and it is interesting to
see how mathematical statements can be derived within a completely formalized proo procedure. As the aim of the course is to develop philosophical and technical aspects o classical mathematics from the beginning, no presupposed. In this course the soope of the presupposed. In this course the scope of the
investigation will be restricted to those aspect of mathematics which are directly useful in the empirical science, particularly physics.
Prerequisite: Philosophy 200 or 201 ; or by Prerequisite: Philosophy 200 or 201; or by permission of the instructo
ext: I. A. MacLennan, Structure-generating

## 431A Introduction to the Philosophy

 Wittgenstein, seminar: 2 hrs.; S. A. M. Burns.Central topics in the Tractatus Logico-Philosophicus and the Philosophical Investigations will be examined. The relationship between the
earlier and the later work, and Wittgenstein's influence on contemporary philosophy will also be discussed. Prerequisite: normally a class in logic, and some work beyond the 200 level in philosophy of language, philosophy of mina, epistemology Kant).

448A Seminar in Philosophy, Politics, and Economics, seminar: 2 hrs.; D. Braybrooke. See also Politital Science 448A and Economics
448 A . First term (every year): Public Good and Political Choice

The economists" conception of "public goods"
is one promising source for empirical political theory, as the works of Mancur Olson (The
Logic of Collective Action) and Norman Logic of Collective Action) and Norman
Frohlich et al. (Political Leadership and Col Frohlich et al. (Political Leadership and Col
lective Goods), which will be studied in this class, show. The conception of public goods class, show. The conception of public goods
also has important implications for normative political theory (political philosophy) and these implications will be followed up, both in the discussion of the books just mentioned and in the course of exploring the connections ational choice (to which philosophers have contributed as well as economists and political scientists).
Prerequisites: Prerequisites: Students taking this class shourd
ideally have had previous classes in all three subjects; but it will suffice for them to hav tleast one of them. Students taking the class or a credit in philosophy should have had lass in logic ( 200 or 201 or 202) and one in thics (310); students taking the class for credit in Political Science should have had a least one 300 -level class in Political Science
315 A and 355 B are recommended); student aking the class for credit in economics should have had at least one $300-$-level class in that subject.

49B Seminar in Philosophy, Politics, and conomics, seminar: 2 hrs;; D. Braybrooke. Se also Political Science 449B and Economi 49B. Second Term (1973-74 and alternat ears): Applied Social Philosophy: The Logic
Ouestions, Policy Analysis, and Issu Processing.
This class will consider the logical character policies, taking them to be best defined ocial rules; and the logical character of issues, egarded as disjunctive questions in which arious rules figure as alternative policies. It W then move on to consider various criteria fo hilosophical concerns with values join up with opical concerns about social indicato Finally, it will study various aspects of in titutional arrangements for defining issues and bringing social indicators to bear upon the eadion Belna on the logic of questions. Bauer Social Indicators; and Lindblom, The Intellig Prerequisites: This seminar may be taken without necessarily taking the P.P.E. seminar in he first term. The same advice applie had previous casses in all three subjects: but had previous classes in all three subjects, but it advanced undergraduate level in at least one of hem. Students taking the class for a credit in philosophy should have had a class in logic (20) or 201 or 202) and one in ethics (310) Science should have had at least one 300 -leve class in Political Science (315A and 355B are recommended); students taking the class for redit in economics should have had at lea redit in economics should
one 300 -level in that subject.



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M. Mastiphy of Language, seminar: 2 hrs

The elements of language have meaning, but what is the meaning of 'meaning'? Various
theories of meaning will be examined. Related issories of meaning will be examined. Related
issuilosophical importance will also be discussed (e.g., the analytic/synthetic distinc tion; synonymy).
Prerequisites: Phi
Prerequisites: Philosophy 100 or a logic class, nd at least one class beyond the 100 level in nalytic philosophy; or by permission of the
instructor

460 Contemporary Philosophy of Religion, seminar: 2 hrs.; F. H. Page.

A phenomenon of quite recent philosophy the amount of activity in the field of the
philosophy of religion. The seminar investigate examples of this current interest and endeav ours to map the salient features. Students will be admitted at the discretion of the instructor Some acquaintance with the traditional problems of the philosophy of religion togethe epistemology, ethics, the philosophy of language, the philosophy of mind twentieth century philosophy, would be an advantage.

Physic
Professors
W. J. Archibald
M. G. Calkin
E. W. Guptill
C. K. Hoyt
M. J. Keen (Oceanography and Geology)

Associate Professors
D.J. W. Geldart (On leave 1973/74)
R. D. Hyndman (Oceanography)
D. B. I. Kiang
W. Leiper
R. H. March (Chairman)
R. Ravindra (On leave 1973/74)
W. L. Silvert

Assistant Professor
B. L. Blackford
D. F. Goble
B. E. Paton
P. H. Reynolds
A. M. Simpson
C. G. White

Instructor
I. A. Fraser
Postdoctoral Fellows
M. C. Jain
P. Jena
S. Jensen
S. D. Jensen
Y. Matsumoto
D. A. Tindall

Physics in the broadest sense concerns itself with the way in which matter behaves and with
the interaction between matter and energy its different forms. It is an experimental or falseness of a physical theory is to be determined by whether the theory is in agreement with experimental facts. The lan-
guage in which these theories are expressed is mathematics. Students wishing to become professional physsicists engaged in original research or in university teaching will normally undertake further study leading to the advanced the honours BSc. and Ph.D. upon completing

In order to study the different interactions which occur between matter and energy, the subject is conventionally divided into such opics as mechanics, heat, light, electricity and magnetism. But these are not mutually clusive categories. The fundamental physical
processes occurring are common to several such topics, particularly when viewed in the light our modern understanding of physical processes the atomic level. The first year physic Classes at Dalhousie are designed to give an hese modern ideas and buet which include lying unity of approach to seemingly divers physical situations. Students not concentrating in a physical science and who do not intend to take further classes in physics will normally ake Physics 100. Those who are concentrating a physical science or who intend to take 10. The subject matter of the two classes is ssentially the same, but Physics 110 employs ore sophisticated mathematical techniques, hereby laying the foundations for more dvanced study
In later years students proceed to develop the opics mentioned above within the framework modern ideas of the nature of physical ear after the first is part of the course each establishes a connection between the theore tical and mathematical ideas of the lectures and he world of physical reality. In the third and forth years the student is encouraged to ollow his own interests as much as possible both by designing and carrying out experiments
of his own choosing in the laboratory and by electing suitable classes from amongst the electives available

## Decree Programmes

## General Degree/Major in Physics

 tudents intending to major in physics should clude Physics 110 and Mathematics 100 in their first year programme. Physics 100,12and 245 may not be included in a 'major' and at least one 300 -level class must be included.
B.Sc. with Honours in Physics All students who intend to take a B.Sc. with Honours in Physics are encouraged to discus
their programme with staff members of the department and to consult with the Chairman of the Department at the beginning of the seond year

Year I

1. Chemistry 110 .
2. Mathematic
3. Arts or Science elective

## Year II

Year II
7-8. Two mathematics classes
Year III
11. Arts or Science electiv
12. Class in Mathematic
classes.
Year IV
16. Arts, science or mathematics el
17.-20. Four physics 17.-20. Four physics classes at the

Combined Honours
All manner of combined honours examples are be generated. Tw GEOLOGY and with BIOLOGY Rours been worked out with the departme cerned and form a package which migh Biopt on to further studies in 'Geoph ing a combind rectively. Students con further details from the program may should in any case consult the Deprtmen before the beginning of their second before
study.

## Classes Offered

100 General Physics, ( 3 sections), lect:: 3 problem session: 3 hrs.; C. G. White Archibald, J. G. Cordes.

This is a survey class requiring no preparation in physics, and offered for students in arts, pre-medicine, pre-d as a prerequisite to advanced classes in

The class surveys physics from its begina the present day. The four major Newtonian mechanics (motion, f momentum, energy); electromagnetism
clectric and magnetic forces and field ivity (space, time, mass, energy); heory (elementary particles, atoms and chance).
The major topics are dealt with historical sequence. To a large extent in later topics are built on the ideas standing of later topics depends on the tanding of earlier topics. Thus, the fo opics mentionned are not at all isolat each other, but are rather closely inter
ic ideas. The mathematics used is not of high school algebra and trigonomt some time is spent in the class gics. It must be stressed that mathe ticc. It must be stressed that mathein" numbers; rather, the emphasis is on a thorough understanding of the
and range of applicability of the
art of the class consists of developing nding of physical principles through problems. For this reason, there is a 3 ssion each week during which students
lems with the assistance, when required, lecturer and graduate students. The are linked closely to the lecture
and sometimes extend the subject and sometimes extend the subject
the lectures. The problem sessions are the lectures. The problem sessionsare he problems with each other as they ere are no laboratory experiments in
R. Atkins, Physics, 2nd ed., Wiley,
neral Physics, lect.: 3 hrs. ( 2 sections) 3 hrs.; E. W. Guptill, R. H. March.
ss introduces the student to the tary physical laws of our universe and
in which these laws are used to forecast in which these laws are used to forecast lativistic variation of mass, the flow of ical current in a circuit, etc. Newton's
for example, are stated and then one or example, are stated and then one
by asking "what do these laws say by asking "what do these laws say he position of a projectule after a certain guessing is eliminated. Reasoning of kind requires more sophisticated mathess than one normally uses in high school
sonsequently a considerable fraction of the sequently a considerable fraction of the ics as differential and integral calculus.
ghout the year students will have an Unity to assess their progress by the of weekly quizzes which are given during ontonal laboratory work and give the ample time to discuss his problems with r. Most of the experimental work is to lecture room demonstrations.
ts beginning this class should be familiar tigonometry, the solution of quadratic ared to start differential and integral Previous work in physics is no
Beuche, Introduction to Physics for
nd Engineers, McGraw-Hill, 1969.
and Heresy, lect.: 3 hrs.; W. Silvert.
ss is primarily for non-science majors, prior knowledge of science or matherequired. The object of the class is to
do research, and how they have profoundly affected our culture and our society. The f revolutionary developments in physics with trong emphasis on the philosophical, historical, political and religious problems involved.
The first part of the class deals with space time, and motion, starting with Aristotelian physics and continuing through the Copernican
revolution to the mechanistic theories of Newton. Then we leap from the 17th to the 20th century to study special and general relativity. The next part of the class deals with electricity, magnetism, and the nature of light. inally we study the theory of elementary particles, which includes some elements of class (space, time, and motion), the development of ideas is logical rather than historical hus the existence of magnetism is seen to be a direct requirement of special relativity, an uantum mechanics appears as a logical con equence of Newton's optic.
he recurring theme of the scienist as heretic emphasized throughout the class. Many re olutionary developments in science have had profound cultural consequences - these includ he Copernican revolution, which overturne aiblical cosmology, and Darwinism, which did
away consequence, scientists have often been branded as heretics - Galileo was forced to recant his theories, Bruno was burned at the take, Stalin purged geneticists and Hitler lass is whether this recurrent pattern is only series of aberrant episodes, or whether reflects a basic characteristic of science itself.
here is no scheduled laboratory in this clas, lowever, each student must carry out an heory that one learns physics by doing it Text: L. N. Cooper An Introduction to Meaning and Structure of Physics, Harper Row, 1968, and several supplementary paper

211 Mechanics, lect.: 3 hrs.; lab.: 3 hrs., A. M Simpson.

## and

31 Electricity, lect.: 3 hrs.; lab.: 3 hrs., I.A
Fraser
hese two classes are intended to be complementary, and for second-year honours stuents. Unless the circumstances are unusual, common laboratory together. The classes have aboratory periods is included in the grade for both classes.

Prerequisites are also common: Physics 110 and Mathematics 100. (Statistics have shown that a student with less than a " B " grade in Physic 211 and 231).
some simple circuits.

Students are expected to have an introductor knowledge of the nature of electric charge, current as developed in Physics 110 . Text: Berkeley Physics Course. Vol. 2 Ele. ctricity and Magnetism, McGraw-Hill, 1965.

221 Waves and Modern Physics, lect.: 3 hrs. lab.: 3 hrs.; C. K. Hoyt.
This class is intended mainly for those who do not plan to take honours physics but who wish
$t$ is assumed that students are familiar wit 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.

## 11 Mechanics.

The class is divided into 2 parts: mechanics an wave motion. The first part deals with basi ector mathematics and its application to description of New laws of motion and thed ference frames, the two principles of specia relativity and their use in describing space and ime intervals in unaccelerated referen from both the classical and relativistic view point. The last topic in the first part of the class is harmonic oscillation, which provides introduction to the second part, wave motion, In the study of wave motion, examples are taken from many branches of physics Fourier analysis of wave packets and pulse will be included.
Text: Berkeley Physics Course, Vol. 1 Mechnics, McGraw-Hill, 1965; Berkeley Physics
Course, Vol. 3 Waves and Oscillations, McGrawCourse, Vol
Hill, 1965 .

## 231 Electricity.

The material discussed in this class forms pat of the Berkeley Physics Course. The class begins by studying electrostatics, distributions of
static charges, and the concepts of electric field and electrics, and the concepts of electric Nid and electric potential as physical quantities.
Next, the motion of charge in conducting materials is discussed leading to the solution of circuit problems involving capacitance and inductance. By considering the electric field of a moving charge in the light of the theory relativity, the nature of the magnetic introduced and its properties discussed. The
relationships between electric and magnetic relationships between electric it and hown how
fields are then studied and it is she these relationships imply the existence of electromagnetic radiation. Electric and mag netic fields in matter are also discussed.
The laboratory work is designed to illustrate The laboratory work is designed to illustrate
the physical principles discussed in the lectures use of electronic apparatus and to the design of
 lativity, the nature of the magnetic netic fields in matter are also discussed.
to learn more about 20th century physics than is possible at the first year level.

Waves are studied first, since their properties and the terminology used in connection with of modern physics. Wave equationshare do much
thed both for mechanical and for light waves, and it is shown how all the various wave properties
can be derived and used.

The central role played by light in forcing revision of 19th century ideas is brought out. The resulting relativity and quantum theories are applied first to simple idealized situations,
and then to more realistic ones in discussions of and then to more realistic ones in discussions of
the hydrogen atom, the structure of atoms and molecules, and the statistical properties of large assemblies of molecules. The necessity of using the newer theories will be apparent by the existence of phenomena which cannot be explained by the older one

Finally, the world of sub-atomic particles wil be explored to show how the experimenta facts are still compelling physicists to revis Prerequisite: Physics 110, Mathematics 100 Students are expected to be familiar with harmonic motion, and the simpler aspects of special relativity.
Text: H. D. Young, Fundamentals of Optics and Modern Physics, McGraw-Hill, 1968 .
222 Radiation and Environmental Physics, lect.: 2 hrs.; lab.: 3 hrs. per week for a
maximum of 10 weeks; plus demonstrations, visits and films as arranged. W. Leiper.
This is a physics class which does not involve the use of calculus. The properties of atomic
and nuclear radiations are explained and the and naclear radiations are explained and the
class also covers radiation detectors, applications of radiation in health physics, pollution monitoring, agriculture, rock-dating, etc.
The major radiation hazards to the environment are nuclear reactors and H -bombs, and their
construction, properties and effects will be discussed.
Prerequisites: Any first year physics class. Other students will have to seek approval of
instructor.
Text: Hurst and Turner, Elementary Radiation Physics, Wiley, 1970.

230 Mechanics, Electricity and Magnetism,
This class is designed for second year science and engineering students who wish to take a
second class in physics, in addition to Physics 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. The class will include discussion of the essence of classical mechanics, with an in-
troduction to relativistic mechanics, and the troduction to relativistic mechanics, and the
essence of classical electricity and magnetism. Substantial emphasis will be placed upon the
important ideas which arise from these fields of physics, and upon their present relevance.
Prerequisite: Physics 110 , Mathematics 100 Prerequisite: Physics 1
Text: to be announced.

## 231 Electricity

See description with Physics 211.
245 Planetary Science and Astronomy, lect. hrs., P. H. Reynolds, R. H. March, R.
Hyndman. Hyndma
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 findings unse. We shall use some of the major study the Earth as a planet. We shall discuss to contributions made by the space program - for example, the Apollo flights to the Moon and the Mariner 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 evolutio with time; the structure and age of our Galax and the universe of galaxies; pulsars, quasars other recent interesting developments in arious cosmological models. Prequisite: one first-year science course
Texts: One or more will be selected.
250 Astronomy, lect.: 3 hrs., P. H. Reynolds.
This is a basic course designed primarily f tudents who may wish to pursue more advaned tudies in astronomy or in astrophysics.

Students will be given the option of either writing one or two major term papers or doing periments. The latter may involve some tele scope observing.
I. The Solar System: the Earth, Moon, meteorites and planets; planetary motions and
celestial coordinate systems; the origin and ofestial coor
of the system. motion of the Sun; distances and motions; the motion of the Sun; magnitudes, luminosities,
colours and stellar spectra; building stellar colours and stellar spectra; building stellar
models - the Sun as a star; variable stars; binary star systems; clusters of stars; interstellar gas and dust; stellar evolution.
III. The Galaxies: structural features and dynamics of our Galaxy; particular features of the exterior galaxies.
IV. 'Gee-Whiz' Astronomy: pulsars (neutron stars); black holes; quasi-stellar objects (quasars); an introduction to cosmology.
Prerequisite: Physics 110 or Physics 100 Text: Wyatt, Principles or Astronomy 110 . Edition), Allyn and Bacon, 1971. hr., B. E. Paton.

A course in experimental physics d give students a chance to do non-s ments and thereby encounter and solv own the problems of experimentatio
number of experiments is number of experiments is small (four
students should achieve a real unders a few physical phenomena. Topics $f$ mental study cover a wide range of as atomic physics, mathematical phy state physics and electronics. A measu one of the fundamental constants suc is $e$ is required and other than this th
is study.
Prerequisite: The class is designed for and engineering-physics students Physics 231 as a prerequisite. In addit
other physics classes must other physics classes must be take
rently. Exceptions have been made

315 Modern Physics, lect.: 3 hrs.; D. K
This is an introductory class in mechanics and atomic spectroscopy. possible quantum mechanical conce quantites win be discussed in terms of Text: R. Eisberg Fundsics Depart Physics, Wiley \& Sons.

## 320 Th Blackfor

This class studies the basic princ statistical mechanics and the relation have to thermodynamics together
application of these principes ideal gases and certain physical systems Prerequisite: Some knowledge of partia tives: Mathematics 200 , which may b concurrently with the class. Text: Reif, Principles of Statistical and Th Physics, McGraw-Hill, 1965.

335 Electronics, lect.: 3 hrs.; A. Levin.
The class covers advanced circuit ana linear and non-linear systems, the phy esulting properties of solid state devic
concepts of information and noise an mission lines and filters. Topics treated: network reduction, terminal network and solutions by modulation and rectification, carrier tr in semi-conductors, properties of dio ransistors; electromechanical analo nalog computation methods, feedba control systems, stability criteria, nat
information and noise, properties of distr constant lines and filters.
Prerequisite: Physics 230 or Physic Mathematics 220 or 228 to be taken rently.
Text: Milman and Halkias, Elec
and Circuits, McGraw-Hill, 1967.

## nced Physics Laboratory, lab.: 6 hrs.;

 vance S . T. Nugent.physics and engineering-physics laborahas in which students in groups of two lass ingly on their own initiative. The ental work covers nuclear disintegra$m$ ma and beta spectroscopy and absorpments and Planck's constant determinarmionic emission and ionization experi sing a vacuum pumping and instrumentstem; properties of solid state semicon
and devices; experiments on the and devices; experiments on the
noise distribution of transitors and the noise distribution of transitors and the
analysis systems; experiments with Neon laser, holography, etc. If they udents may do experiments in othe ach as acoustics, optics, fluid dynamics. t, on a topic to be agreed with th is required as part of this clas. ing-physics or permission from the

Special Topics in the History and spectar of Science, seminar 3 hrs.; (Not in 1973/74)

## amics, lect.: 3 hrs.; M. G. Calkin.

efirst term the class will study Lagrangian Hamiltonian mechanics, covering, for te, the material in Goldstein, Chapters 1
$7,8,9,10$ : Lagrange's equation iton's principle, the two body central
problems, Hamilton's equation of motion ormation, the Hamilton-Jacobi equation mall oscillations.
second term the class will study
dynamics, covering topics such as magnetic, waves, radiation from antennas om moving charges, energy loss of particles passing through matter physics, semi-classical theory of radia

Goldstein, Classical Mechanics, Addison Jackson, Classical Electrodynamics,
pecial Relativity, lect.: 3 hrs.; D. F.
discussed include: experimental basis of rentz transformation relativistic kine-space-time; introduction to tensor dynamics.
uisite: Physics 211, 231 and 315 or the sion of the instructor.
Rindler Special Relativity, 2nd ed Rindler,
and Boyd
ces: Taylor \& Wheeler, Spacetime
(Freeman).
uantum Mechanics, lect.: 2 hrs.; D. F.
discussed include: concepts and for
mulation 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 amiliar with elementary wave mechanics ane Schrodinger wave equation.
Text: TBA.
416 Mathematical Methods of Physics, S. T. Nugent.
opics discussed include: ordinary differential equations, complex variables, integral transforms, special functions, partial differential equations, eigenfunctions, eigenvalues, Green's functions, perturbation theory, integral equations, calculus of variations and tensor analysi, mental consent. Texts: Arfken,
sicists (2nd ed.), Mathews and Walker, Math matical Methods of Physics (2nd ed.),
421 Nuclear Physics, lect.: 3 hrs.; W. Leiper.
This is an introductory class in nuclear physics. Topics discussed include nucleon-nucleo interactions, nuclear structure, gamma transitions, alpha decay, beta decay, nuclear reactions, Mossbauer effect, counting statistics, and nuclear detectors.
Prerequisite: Physi
Prerequisite: Physics 315 and permission from partmental consent.
Text: TBA.
423A Introduction to Solid State Physics, lect. 3 hrs.; A. M. Simpson.

This class introduces the basic concepts of solid state physics which are related to the periodic include crystal structure X-ray diffraction, honons and lattice vibrations, the free electron theory of metals, and energy bands.
Prerequisite: Physics 315. Registration requires
Text: Kittel, Introduction to Solid State Phy sics, 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 cofficients necessary to completely deseribe 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, 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 electrons, it + is shown
hat in practice, the magnitude of thes properties is strongly influenced by micros ructural effects such as solid solution alloying,
crystal defects, grain boundaries, textures and crystal defects, grain boundaries, textures and plastic deformation.

Prerequisite: Physics 315, preferably Physics 423 A , and permission from the instructor. Registration requires prior departmental consent.
Text: Hutchinson and Baird, Physics of Engineering Solids, Wiley 1968.
Reference: Nye, Physical Properties of Crystals,

435A Advanced Electronics, lect.: 3 hrs.; Levin.
Properties of intrinsic and doped semiconductors. Carrier generation and transport. Hall effect, Photo effects and Schockley Haynes experiment. Semiconductor diodes; field and carrier densities, transport equations, special
diodes. Transient behaviour in diodes. Bipolar transistors; properties limitations, failure mechanisms. The F.E.T. unijunctions, multilayer diodes, tunnel diodes, thermistors, noise mechanisms in solid state devices. Prerequisite: 4th-year standing and permis
Text: Millman and Halkias, Electronic Devices and Circuits.
444A Optics, lect.: 3 hrs.; C. H. Hoyt.
Topics include a detailed study of the radiation from accelerated charges, the statistical properties of the fields from assemblies of
radiators, interference, diffraction, with attention to the approximations of the Kirchhoff theory, and the application of Fourier transpower of instruments and the characterization of coherence.
A few topics in geometrical optics may be included to assist in understanding the be-
haviour of optical instruments and to provide a background for the better appreciation of some of the topics in physical optics.
Prerequisite: Physics 230, or Physics 231, or Physics 221 and Mathematics 220. The student should be familiar with vector analysis, Max-
well's equations and the use of complex exponential functions. Registration requires prior departmental consent.
Text: Stone, Radiation and ${ }_{p}$ ptics, McGraw. Text: Stone, Radiation and Optics, McGraw-
Hill, 1963 Hill, 1963.
444B Optics, lect.: 3 hrs.; C. K. Hoyt.
This class is a continuation of Physics 444A and deals with coherence, polarization, scattering matter, the electromagnetic properties of and double refraction.
Prerequisite: Physics 444A. Registration re quires prior departmental consent
ne, Radiation and Optics, McGraw, 1963 and assigned readings on related pics
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445 Physics of the Earth, lect.: 3 hrs.; P. H. This is a class in solid-earth geophysics. Topics discussed include: the figure of the Earth and
gravity, seismology and the internal structure of gravity, seismology and the internal structure of
the Earth, the geomagnetic field, paleomagne tism - the prehistory of the geomagnetic field, heat flow and the Earth's thermal history, electrical conduction in the Earth, radioactive processes and the age of the Earth, global seophysics - continental drift and sea-floor

Taught concurrently with Geology 445
Prerequisite: Registration requires the prio consent of the Department.
Texts: Stacey, Physics of the Earth, Wiley, Mantle, Core, and Crust, Saunders, 1971

462 Applied Geophysics, lect.: 3 hrs.; P. H. Reynolds.
This will be a theoretically-oriented course designed for senior undergraduates and for mathematics and physics will therefore be required.
Topics: Fundamentals of elasticity theory and the wave equation, plane seismic waves in
layered media, seismic interpretation theory layered media, seismic interpretation theory, tion of gravity data, reduction and interpretation of magnetic data, the resistivity method, lectromagnetic induction theory, methods and interpretation

Taught concurrently with Geology 462/562 See also geophysics courses offered in th
Geology and Oceanography Departments. Trerequisite: Interested students should cons Prerequisite: Int
with instructor.
ext: Grant and West, Interpretation Theory

Other geophysics classes are also offered in the Departments of Geology and Oceanography.
Physics 470, Topics in Biophysics, lect.: 3 hrs. M. H. Jericho. Times to be arranged.

The purpose of the course is to introduce students with a background in physics to the field of Molecular Biophysics. After a review of basic cell structure the energetic and statistical relations in the living cell will be discussed.
Other topics that will be covered include: Information content of biological systems, physieal methods of determining the sizes and shapes of molecules, X-ray analysis of molecu-
lar structures, intramolecular and interlar structures, intramolecular and inter-
moleculor forces, as well as topics in radiation moleculor
Physics.

A background in biology will be helpful but is not essential. The main reference books for this course are "Molecular Biophysisc" by R. B. Setlow and E. C. Poliard and "Molecules and Life", by M. V. Vol'kenstein.

Prerequisites: A class in basic thermodynamics (such as Physics 300), some background pre-
paration in Modern Physics and Quantum Mechanics and the permission of the instructor

## Graduate Studies

The Department of Physics provides courses of study leading to the advanced degrees of M.Sc. and Ph.D. Areas of research undertaken at
Dalhousie include: solid state, geophysics energy nuclear physics, low temperature. the oretical physics, and oceanography. Further
details are given in the Calendar of Graduate Studies.

## Political Science

## Professors

J. H. Aitchison (Chairman)
J. M. Beck
D. Braybrooke
K. A. Heard (Chairman-elect)
M. K. MccG wire

Associate Professors
A. P. Pross (Coordinator, Public Administration D. W. Stairs

Foreign Policy Studies)

## Assistant Professors

P. C. Aucoin (On leave 1973-74)
R. M. Cameron
R. L. Dial
W. R. Mathie
J. D. McNiven
D. J. Munton
D. H. Poel
T. M. Shaw
T. M. Shaw
J. A. Wouk

## Special Lecturer

K. Antoft
R. K. Daley
C. J. Gardner

Foreign Policy Research Fellows
G. R. S. Hawkins (Executive Director, Centre for Joreign Policy Studies)
J. Jorgensen
J. McDonnell
J. McDonnell
J. McDougall
K. M. Sharma
K. M. Sharma

Government is as old as human society. Even whether thas some form of government, master, whether husband father is absolute master, whether husband and wife share in the also share in the decision-making the children of the most important differences betwe Plato and Aristotle is that Plato believed and Aristotle did not, that the government of the tate is essentially the same as the government of the family.

Some poitical scientists define political science as the study of decision-making. With some mportant exceptions, they are not interested in dying how private individuals reach d
grons: rather, they are concerned w groups of human beings come to political scientists would include all grost. the family, the business corpor business office, the university, the trade the tennis club, and their "governme

One of the obvious exceptions above is the case of the absolute dictat state who, because he is an absolute makes his decision as an individual acting In this case the political scientist is inter coming to his decision. Some political sci coming to his decision. Some political sc
would also include the absolute rule groups, the patriarch of the old-fas family, for example. But all political would agree that political science incl study of the reasons why individuals of the state. The political scientist interested, for example, in why the vo to his lonely, private decision when h his ballot in a polling booth. Some scientists would include within the subje
private decisions private decisions people make concernin gelong, such as the family. But it is that there are some private decisions wh of no interest to the political scientist.
When a group has to come to a decisio question of common concern, the out members of the group have over one Much has been written recently, for inst on the greatly increased power a prime $m$ now normally has over the other membe his cabinet. Consequently, some political tists consider that "power" is the key con
that distinguishes political science from subjects. Again, some political scientists include within the subject the study resolution of power conflicts within other than the state
Since to govern is to make decisions bind groups, since power relationships come the voter in the polling booth participa the selection of those who are to make decision-making and power relationships
covered when political science is defined a study of government.
When we look at what political scient actually do, we find that they almost confine themselves to the study of the stat
its government. The government of the its government. The government of the st
the core of the subject. There are good re for this concentration on the government o state. One is that in our time the state pla onstantly expanding role in economic ocial life; the great dangers inherent in m 0 inter-state relations constitute another. B state claims supremacy over all other gro within its boundaries and normally poss nough
great preponderance of coercive power disposal of the state that more than special importance.
policy decisions are among those taken governments of states and the outcom more states and their citizens. The study ernational politics, therefore, falls square in the domain of political science
tate has been the subject of serious study the greatest thinkers of the past have much attention to it. To follow and to understand their thought is to ate one's own thinking about the state to guard against the peril of thinking one is
to when one is not. Consequently, political when one is not. Consequently, politiclosophy, which includes the study of the
$y$ ment's principal areas.
ts who wish merely to attain a deeper rstanding of democratic government and in general of Canadian Government and
in particular will be most interested in in particular will be most interested in
science 100 and 200 . The scope of the , however, is so large that students in the course are advised, and those taking rs in it are required, to concentrate on
of the four principal areas. While it is of the four principal areas. While it is or four years to become a complete al scientist, it is the aim of the departto present undergraduate students as far sible with a unified central view of the range of political science in its presen
cialization in political science affords an ellent preparation for many positions in the c service, journalism and for the study of lany students who have specialized in al science are now found teaching in high

Degree Programmes
ts concentrating in Political Science may
one-year, two-year, or honours pro individual programme are chosen in individual programme are chosen in
altation with a faculty advisor from the rtment, in accordance with the general uirements listed below. Undergraduate promes may consist of specialization in one
field of Political Science or a general eld of Political Science or a general
tion of courses from a number of sub-fields Political Science or a general selection of rses from a number of sub-fields. These ds are noted below.

## uirements

year programme will consist of not less
nor more than 4 classes in Political
,
of the four sub-fields under which the 200 -level and $300 / 500$ level classes are listed.

A one-year programme will normally consist of 200 -level classes but may include one or more at the $300-\mathrm{level}$.
*NOTE. The requirement of a 100 -level class for a one-year programme ma
especially for third-year students.

A two-year programme will consist of 100-level class and not less than 4 nor more than 7 additional classes in Political Science least two sub-fields.

In the 2 nd year of a two-year programme a many classes as possible should be at the must be at the 300 level

An honours programme will normally consist of a 100 -level class and not less than 8 nor more than 10 additional classes in Political Science It will include, minimally,
(i) two classes in two sub-fields $200-$-evel,
(ii) four classes at the 300 -level (two of these may be taken as 500 -evel classes),
(iii) and an honours essay.

The honours essay will be worth one-and-onehalf credits. 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 such other data or analytical materials as may be appropriate.
D. Interdepartment programmes will be
worked-out with the individual student and his advisor in consultation with the appropriate

Combined Honours
There are several combined honours pro
grammes:
Political Science and Philosophy
Political Science and History
Political Science and Sociology
Students interested in taking any of these combined honours programmes should consult with the Chairman of the Department or his eputy

Graduate Studies
The Department offers M.A. and Ph.D. proare given in the Clendare, details of which Graduate Studies. Programmes leading to a Graduate Diploma in Public Administration and to the degree of Master of Public Administra-
tion are also available through the Department.

Undergraduate Programme in Public Adminis tration
The Certificate in Public Administration requires the completion of six classes which may tion may be obtained from the Co-ordinator of
the Programmes in Public the Programmes in Public Administration,
partment of Political Science.

Undergraduate Programme in African Studie he Department offers courses which may studies. Further details of this interdisciplinary programme are available in a calendar section above and from the co-ordinator of the programme in African studies.

Undergraduate Advisory System
The advisory system in the Department of Political Science is intended to assist the
student in designing stucordance with his own interests and the requirements of the Department.

Selection: A student wishing to have a member of the Political Science Department as under graduate advisor must be either
(a) enroled in a 100 -level class and contemplating a Programme in Political Science (in which case the advisor will normally be the programme in Political Science. Upon entering the programme a student may indicate a choice of advisor. Normally the advisor will be a faculty member teaching in the student's
sub-field of concentration (if any). The student's choice will be respected unless the member chosen is unable to serve in this capacity. For the student who has no pre-
ference, or whose choice cannot be honoured ference, or whose choice cannot be honoured,
the Department's Undergraduate Studies Com. mittee will assign an advisor on the basis of the student's apparent interests and the present advisory load of the members of the Department.
The advisory relationship may be ended by the student or the advisor at any time and for any advise the same student throughout his pro gramme
Role of the Advisor: Basically, the advisor intended to be available to the student throughmatters. The advisor is not, however, a tutor with regard to specific classes.
Prior to registration (or, in any event, befor the time for class changes has ended) the
student must contact the advisor to dion his/her choice of courses for that year

## Classes Offered

(A) supplement to this list of classes containing additions and possibly minor changes will be issued by the Department in the summer of
1972. Students in their second and subsequen
years are advised to obtain a copy of the supplement from the Department.)
General Information
A. $100-$ level classes are intended as introductions to the field of Political Science and to the
study of politics in the broadest sense. No student may take more than one 100 -level class in Political Science.
B. $200-$-level classes are intended as introductions to specific fields of enquiry in Political are organized into four general areas: National and Comparative Political Systems, Political Philosophy, International Politics, and Public Administration. There are no prerequisites for
200-level classes. $200-$-level classes.
C. $300 / 500$-level classes are seminars for both upper-level. undergraduate and graduate students. Graduate students will, and 4th-year
honours students may, register in these classes honours students may, register in these classes the degree (if any) to which they differentiate formal requirements for 300 and 500 -level students. In general, it is expected that 500-
level students will produce written and oral work of a quality that reflects their greater academic experience.
Admission to $300 / 500$-level classes is at the discretion of the instructor. The prerequisites
listed with each class are intended to show the sort of preparation the instructor anticipates. The instructor retains the right to judge the suitability of each prospective student's quali-
fications for successful completion of, and fications for successtul completion
contribution to, these seminar classes.

Note: Classes will be listed under the following headings:
headings:
(i) Introductory
(ii) Political Theory and Methodology
(iii) Comparative and National Political Sys-
(iv) International Politics and Foreign Policy
(v) Public Administration
(i) Introductory

100 Introduction to Politics and Government The basic introductory course in Political Science is offered as a number of differen sections, with different instructors and differ-
ent emphases. These sections are described ent emphases. These sections are described
below.

Sections 1 \& 2, Democratic Government and Politics, lect.: 3 hrs.; J. H. Aitchison.
The core of the two sections of Political Science 100 offered by Professor Aitchison will processes and problems of government in
n western democracies. Attention will be paid mainly, but not exclusively, to the political
systems of Great Britain, Canada and the United States but with much greater emphasis on Canada than will be the
sections of Political Science 100 .
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 become more knowledgeable about the federa
democracy of Canada and its problems. The scope of the sections, however, will be suf-
ficiently broad to ficiently broad to provide a foundation for
those who wish to proceed to higher level classes in Political Science. ,

Politics, lect.: 3 hrs.; J. M. Beck
The class is designed not only for the student who desires to continue in political science, but
also for the student who will take no other aldo for the student who will take no other
classes in political science. During a short introductory section such questions as the following will be posed: Can there be a genuine science of politics? What approaches may be adopted in a study of political phenomena?
This will be followed by an examination of the This will be followed by an examination of the operative ideals of liberal democracy, fascism
and communism, and a discussion of the conditions that are likely to be prerequisite for the successful working of liberal democracy. The basic part of the class will be a comparative study of the governmental institutions of Great
Britain, the United States, and Canada, especialby designed to acquaint the student with some of the basic problems in the working of modern liberal democracy.
Section 4, Introduction to Government and Politics, lect. and discussion: 3 hrs.; R. Board-

Three major fields of political science will be introduced in this class (1) political philosophy, concepts being studied in the work of Hobbes, Rousseau and other writers, and in some
twentieth-century novels; (2) comparative politics, including an introduction to the workings of politics in Canada, the United States, and the USSR in particular; and (3) international relations, taking in the role of the super-Powers and less developed countries.

Section 5, Political Realities for Beginners, seminar: 2 hrs.; J. A. Wouk.

The focus of this class will be on the main features of current political affairs at the national level. More attention will be paid to
the means by which political issues are handled than to the substance of the issues themselves

The structure and workings of the Canadian "political system" will be introduced, and will serve as a basis for noting, through comparison
with the Soviet Union and the United States, with the Soviet Union and the United States,
the variety of ways in which "politics" can be organized to accomplish essentially similar things. There will be a systematic examination of the major contemporary approaches to political action: opportunism, dogmatism,
ynicism, naive idealism, rationalised and sophisticated pedantry. Attention attention to Political Scientists?" Final dents will be introduced to characteri the media and other sources from wh
derive our knowledge of public aff derive our knowledge of public affai ner) about the implications of these cha ics for the political behaviour of ocieites larger than villages.

## The aim of this class is not

 sophisticated understanding of politics,provide a foundation on which built (perhaps, in part, through a pro Political Science).
Requirements: A moderate amount of to include newspapers, popular mag
pamphlets, novels, scholarly pamphlets, novels, scholarly articles and paper. There will also be required oral pre tions to seminar sessions.

## Section 6, Introduction to Politics, semin hrs.; W. R. Mathie

 hrs.; W. R. MathieThe aim of this class will be to explo dimension of our existencer as members $p$ political communities to which we Attempting finally to determine politics is a necessary evil, an unnecessar or an opportunity for some kind of h
fulfillment, we will consider a number concrete issues generated by Canadian po life, past and present. We will examine, in the purposes and shape of the Ca political community, comparing our own
of parliamentary democracy with of parliamentary democracy with other of democratic and non-democratic gover
federalism, as it concerns the relation the size and character of collective life; problems posed for government and statesm ship by the need to reconcile what is ne for the survival of the community internal and external threats to its conti
existence, with what contributes directl achieving the aims of the community. A of primary and secondary materials inclu records of debates, memoirs, biographies, newspapers will be employed in exploring
issues in Canadian politial issues in Canadian political life. In consid
the more general implications of these frequent use will be made of Aristotle's Pol and Hobbes' Leviathan.

Section 7, An Introduction to Politics Government, lectures and seminar: 3 Aucoin.
An examination of political debate and haviour and the organization and first majorts is undertaken in this class. the major objectives is to introduce stud temporary communities with some life in Canada. Nationalism, law and authority dom, autonomy, and participation, equality, and justice, democracy and sentative government, and the ideo

ver the distribution of goods and will be among the matters considered An analysis of the structures and proof policy-making, also with reference to nadian experience, constitutes the second | concern. The topiss to be dealt with in |
| :--- | egard include executive control and the

of coordination, the position and ce of bureaucracies and pressure groups, portance of legislatures, and the roles of mment in the community. The course is
med to expose students to the basic ned to expose students to the basic
ions and problems of politics and governions and problems of politics and govern-
as found in both analytical and descrippolitical science literature.
class will include lectures, group disns, and individual/group projects. Stuwill be evaluated on their written tions and class participation ustice, Law and Morality, seminar: 2 hrs.;
im of the class is to engage students in examination of a major problem in
cal philosophy. Specifically, we will conthe discussion of justice in Plato's Re c, Aristotle's Ethics and Politics. Hobbes Utilitarianism as well as such conorary contributions to the question as
of Hart, Rawls, and Kelsen. The class will ed through the careful reading and collecdiscussion of these texts, seeking thereby darify the relations between justice, law, and ept. If necessary, the class will be divided smaller groups to facilitate such discussion. equisites: Pol. Sci. 100, or an introductory
se in Philosophy, or, in the absence of of these, the consent of the instructor.

Mediaeval Political Philosophy, lect.:
H. Aitchison.
class will survey the development of to the end of the sixteenth century. It focus principally on the teaching of the Dies, the early Christian Fathers, the Roman wyyers, Augustine, Aquinas, Marsilius,
achiavelli, More, Hooker and Bodin, and of se who participated in the controversies
ween the Papacy and secular authorities and Conciliar Movement.

## offered in 1973-74

$43 B / 543 B$ Max Weber and the Foundations of
Mntemporary Theory in the Social Sciences, offered in 1973-74).

45 Man, Society, and Politics: the Con-
of Community, seminar: 3 hrs.; W. R
ncient and modern political philosophy differ radically in the problems that each treats a entral to political science and political life
Ancient political science was concerned assess the justice of various claims to rule in the city and to consider the nature of the various forms of community that corresponded
those claims. Modern political philosophy concerned to account for and justify the obligation of individuals to political authority to establish how government can be based on consent, and to determine the proper relation between "state and society". In this class we will explore this transformation in the characte can be understood in terms of a changed conception of the political community, or more generally of the political dimension of human existence. Texts that will be considered include Aristotle's Politics and Nicomachean Ethics, Seobos Leviathan and De Cive, Locke' Laws, Rousseau's Social Contract, Marx's "0n he Jewish Problem", and Tonnies' Community and Society.
351A/551A - The Nature of Findings, Ex planations, and Theories in Political Science seminar: 2
1973-74).

352/552 Introduction to Research Methods and Data Analysis, seminar: 2 hrs.; D. Munton.
A knowledge of the promises and pitfalls social science research is as important today to or researcher. This seminar is intended to be broad, non-technical introduction to the as sumptions, procedures, and problems of em pirical investigation in political science. The five major stages common to all such research
theory, research design, data-collectio surveys, simulation, aggregate data, etc.) (surveys, simulation, aggregate data, etc.)
measurement, and analysis - are explored using substantive readings from various sub-fields of he discipline
The major assignment in the course will be research project of the student's own choice and design. It is not expected that students wil rogramming but it is hoped that all are or ca become excited by the joys of disciplined become ex
discovery.

353B/553B Contemporary Empirical Theory Survey, seminar: 3 hrs.; P. C. Aucoin and W. R. Mathie; (Not offered in 1973-74)

448A/548A Seminar in Philosophy, Politics, nd Economics: Public Goods and Politica Choices, seminar: 2 hrs.; D. Braybrooke.

The economists' conception of "public goods" is one promising sourse for empirical political theory, as the works of Mancur Olson (The Logic of Collective Action) and Norman tive $\operatorname{Goods}$ ), which will be studied in this class, show. The conception of public goods qlso has
mportant implications for normative politica
heory (political philosophy) and these implica tions will be followed up, both in the discussion of the books mentioned above and in the course of exploring the connections between heir findings and formal theories of rational as well as economists and political scientists. (Same as Philosophy 448A/548A and Eco (Same as Philosophy $448 \mathrm{~A} / 548 \mathrm{~A}$ and
nomics $448 \mathrm{~B} / 548 \mathrm{~B}$ ).

449B/549B Seminar in Philosophy, Politics and Economics: Applied Social Philosophy The Logic of Questions, Policy Analysis, an Issue-Processing, seminar: 2 hrs.; D. Bray brooke.

This class will consider the logical character o policies, taking them to be best defined as social rules and the logical character of issues egarded as disjunctive questions in whic regarded as dissunctive questions in which
various rules figure as alternative policies. It will
then move on to consider various criteria for resolving such questions - criteria in which philosophical concerns with values join up with topical concerns about social indicators Finally, it will study various aspects of institu tional arrangements for defining issues and bringing social indicators to bear upon them Action; Belnap on the logic of questions; Baue Social Indicators; and Lindblom, The In elligence of Democracy. (Same as Philosophy $449 \mathrm{~B} / 549 \mathrm{~B}$ and Economics $449 \mathrm{~B} / 549 \mathrm{~B}$ )

355A/555A - Marxist Theory and Its Upshot in the World Today, seminar: 2 hrs .; D. Bray brooke.

Social objectives inherited from earlier socialis thinkers, especially Saint-Simon, inspired $K$ Marx's life work and thought; general philos
ophical ideas imparted by Hegel contributed ophical ideas imparted by Hegel contribute inclination; the analytic apparatus developed by classical economists of the British school especially Ricardo, gave the thought its cutting edge as a critique of standing social arrang ments. The class will spend some time identify ing each of these influences upon Marxist
theory; then consider the classical Marxist nalysis of capitalism and various attempts which have not come to an end, to accon modate it to developments which Marx appears not to have anticipated in some important
respects.

55B/555B - Marxism as an proach in Contemporary Social Science seminar: 2 hrs.; D. Braybrooke. (Not given in
1973-74)

This class will discuss the implications for the sudy of politics of contemporary Marxis Sweezy, Mandel, and Sherman). the critioue of apitalist culture developed by philosoph ean-Ped with the Frankfurt School; doan-Paul Sartre's use of Marxism as a meth odology for social science.


[^6] resolving such questions - criteria in
philosophical concerns with values join bringing social indicators to bear upon rooke. classical economists of the Briti conomics (by Western writers like Baran and ,




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120
(iii) Comparative and National Political Systems (a) Canadian

202 Canadian Politics and Government, lect.: 3 hrs.; D. Cameron.
The purpose of this class will be to reach an understanding of the principal features of political life in Canada. Assigned readings,
research projects, and class discussion will used to pursue this goal. The major topics for consideration by the class will be: (1) Canada as a national political community and an in-
dependent nation-state; (2) Canada as a federal political system; (3) parliamentary government political authority, and political freedom, (4) the role of the state in the Canadian community; (5) the structures and processes of
parliamentary democracy; and (6) the struc. tures and processes of policy-making.

313/513 - Intergovernmental Relations in Canada, seminar: 2 hrs.; D. M. Cameron.

This class will examine concepts and issues relevant to the territorial division of governmental power, the nature and substance of
relations between governments in Canada (federal, provincial and local) and the intergovernmental system as a factor in the formulation of policy.
314A/514A - The Policy Process in Canada, seminar: 2 hrs.; A. P. Pross.

A study of the fashion in which policies are system. Various models of the policy making 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 particular attention will be paid to the role of administrative structures.

315/515 The Politics, Government and Constitution of Canada, seminar: 2 hrs.; J. M. Beck. This class is open to those students who have demonstrated competence in Canadian politics class standing in Political Science 202 or its equivalent and in exceptional circumstances to
those students who have obtained high standing those students who have obtained high standing
in Political Science 100. It takes the form of a seminar class in which the students' papers will explore the background, nature and significance of current problems in the politics, government and constitution of Canada. The relation of the political culture, and especially environmental, institutional and personal factors to these
problems will be examined in detail by posing such questions as: Is there a Canadian political culture or simply a number of regional subcultures? Is the Canadian brand of consensus politics a unifying device in contemporary Canada? Can participatory democracy be a
practicable concept in Canadian federal politics? Do the Trudeau reforms permit the executive branch to meet the demands of contemporary society? Have the changes in the
rocedures of the House of Commons since horse-and-buggy era? How well do the Canadian mass media and pressure groups perform the functions which liberal democratic theory conemplates? Should a charter of human rights be ntrenched in the Canadian constitution? Is an ntrenched linguistic bill of rights based on on Bilingualism and Biculturalism feasible desirable? What is and ought to be the competence of the provinces in external affairs? Que veut le Québec, and are classical federalism nd separatism the only alternatives? Is the written constitution desirable?

316/516 Politics in Nova Scotia Since Conederation, seminar: 2 hrs.; J. M. Beck (No offered in 1973-74).

## 319B/519B - The Budgetary Process, seminar:

 hrs.; D. M. CameronThis class is designed for students specializing in Canadian government and public administra ion. While the content of the seminars wil the participants, major attertion will b ocused upon two areas: the development of he budgetary process in Canada, and the reform of the budgetary processes in general.

330B/530B - Canadian Political Parties, lect.: hrs.; J. M. Beck.
The Canadian party system will be viewed as an mong other things the following question will be explored: To what extent have various factors, economic, geographical, regional, ethnic, religious, constitutional and social determined the character of Canadian parties and the party system? How valid are the
findings of Michels, Ostrogorski, Duverger, and R. T. McKenzie with respect to the internal organization of political parties, and do they
constitute a serious limiting effect on Canadian emocracy? In other words, do the Canadian parties contribute towards genuine participating democracy? How useful are the theories o
Horowitz, Macpherson, Lipset, and Pinard in explaining the rise of third parties in Canada? Does Cairns overemphasize the effect of the lectoral system on the functioning of Canadian arties and the party system? Are Porter and Horowitz correct that the old-line political resort to some other means of interest articula tion likely to make the existing party system redundant?
332A/532A Science, Technology and Publi olicy, seminar: 2

333C/533C Research Seminar: Maritim Political Systems. A. P. Pross. (Not offered in 1973-74).

334A/534A Local and Regional

This class will deal with the origins ment, and present legal and fiscal pos various forms of local and regional go in Canada. Special attention will three problem areas; the territorial local government, policy formulatio
fractionalized political system, and th dimensions of urban government.

It is open to graduate and senior under students. Participants must have the Canadian political or an

373B/573B Urban Problems, seminar: D. McNiven.

Each year this seminar will be oriented
theme related to Canadian urban chosene after consultation with the Ins Public Affairs. Topics related to the th hen be investigated
library and fieldwork

375A/575A - The State and the seminar: 2 hrs.; J. D. McNiven.

The aim of this course is to exp interaction between governments and ec organizations, especially businesses, f viewpoint of political science. Topics he nature of government regulatory ions. Others centre upon the role of ment as a stimulus to economic especially in the developmental and ogical fields. Finally, discussion will some evaluation of the impact of upon businesses and the economy as a The implications of these topics for $C$ society will be of prime concern.
(b) Comparative

202 West European Comparative Politic
and discussion: 2-3 hrs.; R. Boardman.
The political systems of West Europe examined in this class, including the fo
EEC powers - France West Germany EEC powers - France, West Germany, Itia
the United Kingdom - the Scandinavia maller states, and the southern and ranean countries. The class will investi global position of this group of ncluding relations with the two supernd with former colonies; their political
ncluding a study of the nature of E socialism; legislative bodies and gove bureaucracies; the role of the State in so economic planning, and problems of development; political issues connecte economic integration; and a number of
questions. We will also look, by questions. We will also look, by
comparison, at some of the distinctive of East European political systems.

The American Political System, lect H. Poel.
erican Political System is a survey of the major domestic features of the politics. There are three broad to the course: (1) American Political (2) Structures, Processes and Beand textbook currently used adopts an perspective for its analysis, while a book padings" provides some "pluralist" conIn lieu of the third lecture hour, students be expected to carry on independent work
of their choice. This may take the form of their choice. This may take the form oup research projects and/or the use of the al survey research projects.

Comparative Govermment and Politics of East, lect. and discussion: 3 hrs.; R. L

Class will deal in a comparative fashion the socio-political development of Modern Asia. The survey will pick up on China, Kin, Korea, and Vietnam at roughly the lineteenth century mark, and trace the h to the present day.
course is open to students without
equisite. There will be one lecture ( $11 / 2$ s) per week. In addition the class will be into discussion groups of reasonable and each group will meet with
uctor for an additional session weekly.

Nationalism \& Nationalist Movements, 2 hrs.; J. A. Wouk
aim of this class is to develop a better terstanding of the issues, political and social amics, and future prospects of Québec
nalism
(\& separatism) and Canadian onalism. This aim is pursued through an mination of "nationalism" as a political e in the internal development of states and
international relations. Among the pheena to be explained in detail are
The Unification of Italy (1850's \& 60 's
The Unification of Germany (1830's-1871) Sinn Fein and Irish Independence
Zionism and the Establishment of Israel The Nat many (1921-34) th) amount a minor (about 300 pages a ms , two mid-term exams. Students un uainted with the political history of Québe Canada will probably feel impelled to do ditional readings.

Public Opinion and Voting Beha
discussion: 2 hrs.; D. H. Poel.
raditional title given is really an excuse to
at a broader area which might be called
icro-politics. The most general concern of the Class is with the questions of how individuals perceive, relate to and participate in political bvious subsets of micro-politics, as are areas of political socialization, personality and politic culture.

Since much of the literature in this area is quantitative in nature, considerable attention will be given to quantitative methods in political science. This considerable attention will, however, not be at such a sophisticated ogether and get the same answer three times in row. This class is not a substitute for a class in statistics.

Last year the class content consisted of fo distinct modules: I - Canadian Content, II II - Talking to the Computer, IV - Looking at Robert Lane's Political Man. The content of Module IV will change from year to year to xamine different areas of micro-politics. The ther modules will remain fairly stable exce or obvious improvements.

305C/506C Comparative Provincial and State Political Systems, seminar
Not offered in 1973-74).

317B/517B Politics in Africa South of th Sahara, seminar: 2 hrs.; K. A. Heard
As part of the Departments' offerings in Comparative Political Systems, this course politics which may be compared, e.g., with European or Asian politics, and (b) a basis for comparison among African states themselves. The course concentrates on the domestic problems of the new African states - e.g. economic change - and the various strategies, both ideological and institutional, that have been adopted in response to these problems. As well, some attention will be given to the particular policies and institutions operating within the Republic of South Africa. Particular
notice will be paid in this course to the strategies of political participation on the one hand and political exclusion on the other.

318/518 The Politics of South Africa, seminar K. A. Heard, (Not ofered in lis Politics of New States, lect. and discussion: 2 hrs.; K. A. Heard.

This class deals with the internal problems and theories of development. It will cover such subjects as concepts of development and underdevelopment: cultural patterns in developing nations, the impact of colonial regimes on alization; urbanization and socialization; communication; ideology and nation-building; economic problems and policies; the role of the
systems.
It is intended primarily for graduate student ut senior undergraduates may be admitted on pplication to the instructor.

324B/524B Problems of Development: New States in a Stratified International System, seminar: 2 hrs.; T. M. Shaw
New states are relatively open and unde developed actors in the global system; this class examines their attempts to maximise nation control and to achieve equivalence with selected models. We will focus primarily on the external dimensions of change, and will begin by reviewing theories of underdevelopmen stratification and imperialism. Our focus wi development at the national, regional and global levels.

The seminar will include such topics international stratification, subordinate sta systems; nonalignment and self-reliance; Third
World diplomacy, and international law and organisation, race and ethnicity; economic nationalism; imperialism and interdependence aid and dependence; the implications of new states for world order; selected case studies of new state foreign policy-making; and, technical change and peripheral states.

326A/526A Sinology - The Study of Chinese Politics 1840-1950, seminar: 2 hrs.; R. L. Dial.
This class is designed for three purposes. The first is to reach a better understanding of this through expanded and more detailed readings. However, of equal importance will be the epistemological assessment of the various "theories and models of history" put forward by the authors; what underlying assumptions the writers have and share, and how might their conceptualizations be made betce atter.

A third and related objective of the class will be to assess the relative merits of four mediums of explanations: the chronological text, the research monograph, the biography, and novel.

This is a very heavy reading seminar. Students not able to keep up on a weekly basis should definitely not attempt the class. The seminar is open to students without previous work in
Chinese politics, provided they are prepared to Chinese politics, provided they are prepared to
pursue additional readings on their own to compensate for their lack of background.

326B/526B Sinology - The Study of Chine Politics 1950-1972, seminar: 2 hrs.; R. L. Dial This class will seek to define the existing paradigm in the study of Chinese politics and to locate the causes and areas of changing thought about the subject. Each week the class will ndertake discussion of a particular soci

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science approach, its effects on the larger paradigm, and its utilities and disutilities in explaining particular phenomena. The readings
will cover the application of the following will cover the application of the following
models to the Chinese case: communication theory, rural marketing systems, Maoist mobili
zation theory, organization and bureaucratic zation theory, organization and bureaucratic
concepts, management concepts, radical economic theory, the concepts of political culture urban sociology, and totalitarianism.
$326 \mathrm{~A} / 526 \mathrm{~A}$ is NOT a prerequisite for this class.
338B/538B The Politics of the Environment, lect. 2 or 3 hrs. To be announced.

A discussion of the policy process as it relates to issues in the "environment crisis". Special socio-cultural values (e.g., the recent growth in importance of wilderness areas) and their impact on the policy process as a dynamic
interaction, media, political parties, pressure groups (including spontaneous protest groups) socialization processes and administrative organizations.
(iv) International Politics and Foreign Policy

223 Techniques of Statecraft and Problems of Order in International Politics, Ihct.: 2 hrs.; D. .
This class is designed as a basic introduction to the study of foreign policy and international relations, and its primary purpose is to equip
students with rudimentary concepts and tools for analyzing the actions and inter-actions of the various participants in international affairs. There are perhaps as many approaches to the
study of international political phenomena as there are questions to which the phenomena give rise. In this particular case, two general perspectives are employed, and these serve to The first part is concerned primarily with the formulation of foreign policy, and it seeks to deal with such questions as: What are the principal processes and ingredients of foreign policy decision-making? How do these pro-
cesses and ingredients affect the content of the decisions that are made? What instruments do the decision-makers have at their disposal in affairs? Under objectives in interional instruments likely to be effective or ineffective? And, what criteria are employed in selecting one "mix" of instruments as opposed to the
other available combinations? These and similar issues are discussed under a variety of headings, including in particular: (a) Intelligence and Foreign Policy Decision-Making; (b) The Planning of Foreign Policy; (c) Negotiation as a Foreign Policy Instrument; (d) Propaganda as a
Foreign Policy Instrument: (e) Econonic Man Foreign Policy Instrument: (e) Economic Mani-
pulation (including various forms of economic sanctions as well as such positive devices as foreign aid); (f) Informal Penetration, or Subversion; and (g) Military Force.

The second part approaches the study of of individual actors and their capabilitites. But rom that of the international community as whole. It involves consideration of a variety of theories" of international politics, but the core problem around which the readings and
class discussions are arranged is the problem the maintenance of international order end conditions which permit the resolution of conflict by peaceful means. The various in fluences and mechanisms which contribute, or are alleged to contribute, to the performance of this function are discussed under a number of
headings, including (a) International Law; (b) Disarmament and Arms Control; (c) Concert Systems; (d) Balance of Power and Alliance Systems; (e) Collective Security; (f) Peacekeeping; (g) Public Opinion; and (h) Regional unctional Organizations. It is obvious tha hese mechanisms, taken singly or in combina made to explain the nature of their respective limitations.

There is no single text, and students are equired to read selections from a variety of

Comparative Foreign Policy, lect. and har. 2-3 hrs.; R. Boardman.
This class will attempt to analyse in a compara tive framework the foreign policies of a numbe of countries. Discussion of a particular state's
foreign policy will be the responsibility of member of the Department having a detailed and expert knowledge of that country. Study of these countries will, however, be organised will a central common framework, which political parties and interest as the role of formulation of foreign policy, the impact of broader considerations such as geographical location or history or economic growth, the demands made by other governments in alliance-systems, the part played by ideology of military capability, the central organization examined will include Canada, the United States, the USSR, China, and Britain, and a number of African States.
317A/517A Foreign Policies of African States lect. and seminar: 2 hrs.; T. M. Shaw
nationd examines the four levels of inter policies interaction in Africa: the foreign regional subsystems, African continental politics, and Africa's impact on the global system. New states have produced novel discon-
tinuities in concerned with the diplomatic, developmental and methodological implications of African participation. After a theoretical introduction to the behaviour of new state actors and Third
World organisations in the international milieu, we turn to an examination of particular issues and states, from alternative African ideologies to the external linkages of diverse actors.

This range of topics will include unity - the OAU and ECA: African in unity - the OAU and ECA; African inte

- EAC, the Entente, Arab States Africa's inherited problems ment, border conflicts and refugeess; A race - human rights and Southern African foreign policies - Tanzania, G
Ivory Coast, Senegal, Egyyt and B conflict and cooperation in Southern

320/520 Conceptual Development in the of International Politics, lect. and dise L. Dial (and staff)

This class will treat in a survey fas variety of conceptual approaches to th elations foreign policy behavior of sta system. It will be in in the intern dealing primarily with other words, conceptual frameworks, and theorist underlie our present and future under of international politics. It will, howeve short of any extensive dealings with the methodological techniques, which are enlisted in the service of research with chools, (e.g., field theorists may use In this class we shall explore the con parameters of field theories, but not the methodological designs for factor an elsewhere in the curriculum

Some of the analytical sots to and assessed are: systems analysis and heory, integration theory, field theory and decision theory, game theory approaches, intere

The instruction of this class will be exercise. Explication of each approach tudy of international politics will be experienced in thors knowledgeabl

321/521 International Regional and ational Organisations, lect. and sem hrs.; T. M. Shaw

Von-state actors play increasingly im oles in the international system; this cla focus on three types of multinational ffectiveness will investigate their origin, goa mpirical overview of such international ystems. In particular, we will examine ffect on global, regional and function egration and analyse their impact on ses peace and development. The r ases will include the UN and its spe gencies, military alliances, continental $p$ structures, regional economic arrangem and transnational relations, such as the n groups.

## W. Stairs and D. J. Munton.

inar focuses on the sources, formula
and content of Canadian foreign and policy from 1918 to the present. The test emphasis will be devoted to the ane the Second World War

4B Problems of Development: New a Stratified International System 2 hrs.; T. M. Shaw.
ription under Section 2(b) above)
27A The Formulation of U.S. Foreign seminar: $2-3$ hrs., J. A. Wouk.
nental policy is, in large measure, by the mechanics of the decision
as well as by the explicit aims of policy This class will study the foreign policy tion process under the Nixon AdminiIt will seek to understand the present
in terms of the development since World in terms of the development since World of the agencies involved in this process.
weekly seminars will be built around pertaining to both the formulation of jign policy and to aspects of administraorganizational behaviour in general. ments: Seminar readings and presentaAlso probably: one term paper, one final
short seminar papers. (These are short seminar
papers. (These are
ial requirements. The actual requirewill be worked-out at the first class isistes: Some knowledge of US Governand of the history of US foreign ns, especially since 1945. All students
required to have met with the instructor o the second class meeting to ascertain ligibility in terms of these prerequisites.

527B Ideological Foundations of US molicy seminar: $2-3$ hrs.; J. A. Wouk
nars will, initially, deal with writings by policy-makers and academics, which appear
rovide insight into the motivations fo or features of recent US foreign policy. The cation of these ideas, as modififid by acteristics of the policy process, will be
nined through the Pentagon Papers and studies of policy formulation in the Administration.
quisites: See 327 A .327 A is not a pre site, but (i) it will be useful for the second is class will be griven to those who have n 327A.

She Politics of the Sea, seminar: S. Hawkins and M. K. MceG wire
past, the sea has been important rily as a transportation medium for
goods and militry force ast two decades, technological advances aused the sea and its bed to become
nportant as resources in their own righ Chrough sea-borne deterrent systems and thei rena for continuous and direct tactical naval confrontation. The sea now carries pollution to ecological balance is itself in danger. For these and other reasons, established convention about the freedom of the seas, the control and xploitation of maritime resources, territoria rights, international ownership, and variou one-third of the course will consider the environmental factors, and the remainder will concentrate on the policy implications, with particular concern for the legal implications strategic considerations and the effect o international relations.
364/564 Military and Strategic Studies, eminar: 3 hrs.; M. K. MceGwire.

Strategic studies are concerned with military power, and consider four aspects of interna tional relations: the causes and prevention of
war, methods of insuring national (or interna ar, methods of insuring national (or interna
tional) security, the national pursuit of acquistive goals, and the insurgent promotion of political change. This seminar (which can only serve as an introduction to the subject) seeks to develop judgment about the uses of military power in international politics, and an quently conflicting) approaches to the underly ing problems. To achieve this understanding it is necessary to devote some time to studying the historical development of warfare and srategic theory prior to the nuctear age, befor contemporary preblems and doctrines. There are no simple text-books in this area, and the eminar requires a substantial amount of selec tive reading.
365B/565B Chinese Foreign Policy, seminar: 3 hrs.; R. L. Dial.

This class shall cover the causes, policy formulation processes, and behavioral outputs Chinese external affairs. Though there will be ome lecturing, the class will focus on discus ions of article length readings. There will be be chosen as representative of conflicting schools of thought on given aspects of Chinese foreign affairs. It is the objective of the class to transfer the hidden debates in the literatu into the classroom, and hopefully the student minds
366/566 Theories of War and Peace, lect. and discussion: 2 hrs.; D. Munton.

Perhaps the most important problem that has always faced human civilizations is whe ther or neighbours. Many theories exist as to the causes of war: some emphasize man's inherent nature, others the structure of the nation-state, and others the anarchistic nature of the internaional system. Likewise, there are numerons
heories about how to achieve peace, includin deterrence, alliance, negotiation, and passiv resistance. Each of the theories of war sugges means to achieve peace; for example, if on authority in the international system, then the solution" is to create a world government. Correspondingly, each theory of peace assumes a particular cause of war. The aim of this course will be to explore the assumptions, implica trans, and weaknesses of hese coses and recent empirical research (2) Pata
(v) Public Administration

311/511 Introduction to Public Administration, lect.: 3 hrs.; J. D. McNiven
This course is designed to introduce students to the basic concepts of organization theory and administrative behaviour within the context of provincial levels. Emphasis is placed upon the relationship between theory and actual practices. This course
students students a general overview of most of
behaviours and techniques he is likely to encounter in more advanced courses or in administrative situations.
312B/512B Provincial Public Administration seminar: 2 hrs.; A. P. Pross.
This is an advanced research class designed for those who have taken at least one previous class in Public Administration and a class in Canadian Government. Normally the class woul admitted with the permission of the instructor

331A/531A Public Administration Practices, seminar: 2 hrs.; C. J. Gardner.

Emphasis in this course is on the "machinery" of government. While most of the illustration will refer to the Government of Canada, some reference will be made to local, provincial and international bodies. A brief outline is

1. Government organization structure as com pared to that of private bodies, and its ationship to organization theory
2. Administrative functions as performed through the Legislature, Judiciary and Executive. Attention will be focussed on the roles of
Parliamentary Committees, the AuditorGeneral, Public Service Commission, Ombudsman, Privy Council and Prime Minister's
Offices, Treasury Boards, Cabnet Offices, Treasury Boards, Cabinet Committees, Crown Companies, Commissions and Boards of
Inquiry, Ministers, Deputy Ministers and Central Service Departments.
3. Recent developments and their effectiveness will be assessed.

This is an introduction to techniques which ar being used increasingly in the public sector and
which, in themselves, are becoming subjects o specialization. It is important that the public administrator should know (a) the principal of possible application in public servic activities and (c) the circumstances in which the application can be most effective.
The subject matter covered includes: Organization and Methods Services; Organization Analysis; Position Classification and Description
Programme and Performance Budgeting; Procedures and Methods Analysis; Communication and Reporting Systems; Mechanization and Data Processing; and Forecasting and Planning, including an elementary and non-mathematical Operations Research

540C - Colloquium in Public Administration, seminar: 2 hrs.; J. D. MeNiven.

The course will consist of an ongoing series of meetings and activities designed to provide
first-year MPA students and other raduate first-year MPA students and other graduate
students with opportunities to exercise their organizational capabilities. The goal of those involved will be to develop and present a coherent intellectual and practical program on topics related to the field of public administration.

571B - Research Project in Public Administration, seminar: 2 hrs.; A. P. Pross.
Intended for senior graduate students in public administration, the course may be treated as a public administration or as a means of bringing together a group of students to undertake a practical project 'commissioned' by a local public body. Practical projects are intended to provide the student with an opportunity to Administration Programmes and to expose them to evaluation by non-academic bodies.

PS 574B - Advanced Public Administration, A. P. Pross.

This class requires a high level of knowledge of political systems and of the Canadian political system in particular. (Students in the M.B.A. programme can substitute for this a familiarity
with administrative theory.) The course con with administrative theory.) The course con-
centrates on an examination of the behavioral aspects of administration, particularly the rehe develolotween bureaucracy and society and 576C Public Administration Practicu seminar; Faculty in Public Administration

A reading course associated with part-time or summer employment in a public agency. Open
only to senior graduate students in Public Administration graduate students in Public tudent obtain the agreement of his that the student obtain the agreement of his employer
to an 'intershhip" scheme designed to facilitate
he students' exposure to administrative pro esses. Students will be expected to atten assignments intended to complement on-the-jo learning experience.

## Psychology

## Professors W. K. Caird

W. K. Honig
J. A. McNulty (Acting Chairman)
traak Wita Kill
P. H. R. James

Associate
J. W. Clark
J. Dunham
B. Earhard
M. Earhard ${ }^{\prime}$
V. Lolordo
B. R. Moore
S. Nakajima
R. L. Rudolph
R. L. Rudolp
M. Yoon

Assistant Pr
Assistant Professors
T. R. Anders
E. O. Boyanowsky
D. E. Mitchell
F. J. Mortenson
J. P. Wincze

Research Associates and Postdoctoral Fellows G. Hall

Men see and hear, get hungry and fall asleep and for an instant remember in great detai events which have just happened to them Sometimes they hear but do not listen; often they remember only a fraction of what hap-
pened five minutes previously. They make pened 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 the same way; if we knew the reasons why they did so we would have gone a long way towards understanding ourselves.

Psychology is an experimental science, and is done in the laboratory in ine in the subject discover the conditions which control the activities of animals and men, to measure these conditions and the responses they produce, and predicting behaviour and changing it. It is a subject for inventive rather than imitative men, better suited to those who want to find out for themselves than to those who want to be told what to believe. Athough it has been the major 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 which has made these discoveries the challenge. We know for certain are at least two memory systems in of vertebrates, but we do not know h systems are linked together; we know ( to common sense) that things look la
further away they seem to be further away they seem to be, but
understands why the moon on the looks larger and closer than it does in there is reason to believe that at least the mental diseases are not diseases at forms of behaviour which are learn
habits - yet we do not underst people learn these disordered behavio $w$ others escape scot-free.

The laboratory facilities of the departm mongst the best in Canada, and studen re willing to learn the necessary skills, and whose initiative is tempered
a sense of compassion for other creat be given the opportunity to use these to the full.

Degree Programmes
General B.A. or B.Sc. in Psychology Students enrolled in the general (i. year) degree programme must take a min of six classes beyond the introductory meeting the university requirements General B.A. or B.Sc., students in psy should take at least four classes psychology 100. Required classes are elow, together with one additional clas open to students in their final ye should consult with Dr. R. L. Rudolph.

Year 1
Psychology
100
Year II
sychology 200 and two of Psychology 202B, 203A.

Year III
One of Psychology 304, 305, 307, or 3 of Psychology 308, 309, 310, or 312
B.A. or B.Sc. with Honours in Psych Major Programme)
the major honours programme students $n$ ake the nine psychology classes beyo troductory Psychology that are listed
All students who intend to take an degree in psychology should consult w
R. L. Rudolph.

Year I
Psychology 100.
Year II
Psychology 308, 309, 310, or 312

Many people confuse psychology with eithe common sense or psychoanalysis, and most of them beieve that human behaviour is unpredictable in principle, or so complex that we can have no hope of understanding it. The lectures and demonstrations which are given in this class
should disabuse you of these ideas, and at the same time achieve something more constructive and useful; they will provide you with an understanding of the ways in which an in dividuals environment, his past experience and his heredity control the working of his brain and the choices and decisions which he makes.
The class will be taught in a number of sections. Each section will have a number of instructor who will deal with topics basic to an understanding of psychology. The topics vary from year to year and may vary somewhat in the different sections of the class, but the fou of topics which will be covered.

1. The evolution and development of be haviour
The idea that the behaviour of animals is controlled by instincts, and the behaviour of man by innate intelligence, is dead. So is the contending idea that man's behaviour is soley
determined by his environment. We now have clear understanding of the fact that the behaviour of man and animals depends upo both heredity and environment in much the same way as the area of a room depends upon both its length and its width. Our intelligence for example, is a product of a complex and endowment and the environments in which we exist from conception to death.
Like that of all other species, the genetic endowment of man has been shaped by
biological evolution. Unlike other species, man has progressively modified his environment. Thus we are creatures both of biological evolution and of our cultural heritage. A proper understanding of the nature of our aggression sexual behaviour, intelligence, and other chara
cteristics must take into account our evolution ary history, our cultural history, and the often subtle interactions between heredity and envir onment in the course of our development.

## 2. Learning and motivation

What one learns obviously varies from one circumstance to another. Whether one learns depends upon a much more restricted set of conditions, and it is now possible to describe hese in considerable detail, and the measure
many of them with great accuracy. This part of the class will give you an understanding of how two fundamental forms of learning have been solated and studied, as well as provide you with a knowledge of the laws which govern hese two kinds of learning. We will also study he motivational conditions - the physiologica - that determine whether and when an individual will learn and make use of what he has learned. In addition, you will be asped to
hink about some of the problems in this are which are still unsolved: for instance, how do we learn to avoid (as opposed to escape from) pain, does punishment erase learning or simply uppress it, is learning a gradual process, or a

## 3. Sensory processes and perception

e experience colour, form, movement, sound dour, warm th, and so on in the world about world in the form of coded messages trans mitted through sensory systems. Psychologist re concerned not only to measure perceptio but also to explain why we experience things do. In considering such questions as why old than warm objects, or why things normally look single even though we view them with two eyes, psychologists have developed theories bout the means used by the nervous system io signal information. These theories have often een successful in predicting which conditio affect perception.

Detailed attention will also be given to the way experience influences perception. Do animal reared without the opportunity of patten
ision tumble over 'cliffs' when first permitte o see; are normally sighted people able to void obstacles in the dark as easily as blin people; why do young children often confuse "b" and "d"? Questions like these have been
studied experimentally, partly because of their practical implications but also to satisfy man curiosity about the way we know the worl about us.

## 4. Human Performance

his human Perrore cance concerned with the general characteristics of human performance variety of situations. The discussion will hing nainly on the idea that the mind (or the brain) acts as a device which processes and stor literal picture of what actually happened; it the end product of number of complex steps which the evidence of our onsenses is sorted and encoded, rejected or amplified, and integrated
with other memories which are already in store. ,

When a child learns to talk, he does not simply parrot all the sounds which are spoken to him hy his elders. The structure of his nervou system, the limitations of his ability to attend
and remember, and his past experience all force and remember, and his past experience all force
him to select and process only part of what he him to select and process only part of what he
hears. How he does so, and how he manages to
construct for himself an intuitive understanding hears. How he does so, and how he manages to of the grammatical rules of his native languag will serve as one of the examples in this class of
the interplay of heredity, perception and learning.
Finally, some emphasis will be given to the
practical implications of the research discussed practical implications of the research discussed in this section for education and teaching
industrial design, and the adaptations of men to new environments.







 parrot all the sounds which are spoken to

## 465; Psychology 470; one of

sible for students to take an honours combining psychology with a related programme the student must take lasses beyond the 100 level in his two specialization, with not less than four
either area. The student in the honours programme will normally thesis (or the equivalent) in the area jority of his classes. The following mme is based on the assumption that the is taking the maximum number of in pyychology. Any student intending to two respective departments to arrange
logy 100.

304; Psychology 357; one of
logy 305, one of Psychology 307, 308,

465: Psychology 470
ty of other programmes are available in ooperation with other departments. These udents whose specific interests may lie in other than those covered by the major Iours programmes offered by the depart dolph for further information.

## mior Research Assistantships

lumber of Junior Research Assistantships
eavailable, during both the academic term g summer vacation, to students who are hese assistantships, and of the stipends

## Classes Offered

Introduction to Psychology, lect.: 3 hrs .; ITrnged as required. J. W. Clark/ and other s of the department.

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200 Problems in Experimental Psychology lect.: 2 hrs.; lab.: 2 hrs.; P.
members of the department.
This class has two basic goals: (a) to teach yo something about science in general and ex to give you some idea of the content of that to give you some idea of the content of that
business which we call experimental psychology.
The class is divided into two major components which are to some extent independent: the
lecture and the laboratory. They are independ ent in the sense that: (a) there is little attempt to coordinate the topics which are covered from week to week in the lecture with those covered in the laboratory; and (b) there are
different people involved in the teaching and different people involved in the teaching and grading of the lecture and laboratory material.
The general sequence of events in the laboratory is the following. Early in the fall and early
in January you will find yourself running experiments which we have planned in order to give you some orientation to the apparatus and
procedures you will need to know in order to procedures you will need to know in order to
plan your own experiments later. Following the procedural experiments in the fall, you will design, conduct, and report an independent research project which meets your own interests. These experiments - in fact, all of your
lab work in the fall term lab work in the fall term - are restricted to problems using animal subjects (other than
humans). Following the procedural experiments conducted early in January, you will design, conduct, and report on another independent research project. These later projects are re stricted to using humans as subjects.
As you might imagine, you will make extensive use of primary source material in the library in formulating your own independent research
projects. In addition to this journal reading projects. In addition to this journal reading,
two textbooks are used in the class. One Robert Plutchik's Foundations of Experimental Research; the other is Statistical Concepts by
McCollough and Van Atta.
The lecture section of the class will be devoted to a discussion of experimental psychology in general. This includes reference to the specialized methodologies which have been de-
veloped by experimental psychologists and the veloped by experimental psychologists and the
research problems which are thought to be important in contemporary experimental psychology
Prerequisites: Psychology 100; restricted to
major and honours students, but major and honours students, but other students will be admitted with the consent of the

201A Applied Psychology: Behaviour Modification, lect.: 3 hrs.; J. P. Wincze.
The class will examine behaviour therapy procedures applied to the modification of
problems in human behaviour. The emphasis of the class will not be on abnormal behaviour but rather on techniques derived from the principles of learning theory which may be used to
modify problem behaviour. Discussion will cover the historical roots of behaviour therapy and will compare the behavioural model of
therapy to the medical model. In addition, the following topics will be covered: classical and operant conditioning, systematic desensitiza-
tion, token economy therapy, aversion therapy modelling, implosion therapy, and contingency contract therapy for family problems such as marital conflict
Prerequisite: Psychology 100.
202B Applied Psychology: Social Issues, lect 3 hrs.; E. O. Boyanowsky
The class on social issues will survey research findings of social psychology directly applicable to everyday life. The social performance involved in human interaction will be examined - that is, how we create an image for others with our mannerisms, speech, dress and the use and expressions. How the environment affects human relations in diverse settings ranging from abortion clinics, convents and beer halls to airports will be discussed, as well as such social behaviours as aggression, learning and altruism. Topics will vary according to current issues and pornography and drugs, religion and and supernatural phenomena.
Prerequisite: Psychology 100 .
rerequisite: Psychology 100
203A Applied Psychology: Psychological Test ing, lect.: 3 hrs.; R. S. Rodger
The psychometric properties of test scores, i. their true and error components, score re-
liability, score validity, item characteristic distribution forms, the effect on distributions of using scores which are the averages over a number of tests taken, and the process of scaling scores, will be studied. It is hoped that conditions will allow students to participate in time allows it, the variety of possible test (projective and psychometric, essay, free re sponse and multiple-choice, intelligence, personality, aptitude attainment and interest tests) will be reviewed and some history of the testing There is no set textbook: class notes will prepared by the instructor Prerequisite: Psychology 100.

300 Selected Research in Modern Psychology seminar and lab.: 4 hrs.; R. L. Rudolph.
This class is designed primarily for students who wish to gain further experience and research. A student who enrolls in the class is assigned to a member of staff who will serve as his class advisor throughout the academic year. Contemporary research will be discussed and evaluated, and the student will be expected to the supervision of his class advisor
Prerequisites: Previous or concurrent enrolle ment in two other 300 -level classes; and may be
registered for only with the prior

304 Learning and Motivation, lect.:
2 hrs.; R. L. Rudolph W. K.
Psychology 304 deals with the fun principles of learning derived from
with animal and human with animal and human subjects. Since
these principles have been these principles have been discove
investigated in experiments using jects, primary emphasis is placed learning. The discussion of human emphasizes those aspects of behavior unique to man - language and abstract - in addition to more general phenom studied as a separate topic but is terms of its effect on learning and pert

Laboratory session involve (a) experim animals and human subjects, (b) discu the applicability of learning princ
everyday behavior, and (c) an occasio Prerequisite: Psychology 100 (h 203A (general students).

305 Perc
Mitchell.
Psychology 305 considers the way information about the world is provided sehaviour. The material covered in the falls into four sections:

1. The methodological and theoretical lems peculiear to the study of sensatio perception;
2. The transformation of physical this information achieved by the system;
3. The psychological analysis of sensatio their relation to the known facts of physiology;
4. The effects of higher processes, recognition, attention, and memory,
way in which sensations determine warceive the world.

The majority of the class will be
vision and hearing in human beings.
The experimental work to be presented been selected for its importance in
retical understanding of perceptual and the student will be expected to org work around theoretical rather than questions.
The lab work will consists of a introduction to the apparatus and
used in perceptual research, followed mental studies designed and carried ou student individually.
: Psychology 100 (honours stuPsychology 200
siological Psychology, lect.: 2 hrs.; lab. Nakajima, G. V. Goddard
gical psychology is an attempt to behaviour from a biological point of $e$ class begins with a review of the and of the sensory and motor systems. ues with an analysis of anatomical, perception, motivation, and learn
s of background knowledge are to understand physiological psyFirst, students should have general
ge in biology, which can be obtained edge in biology, which can be obtained
竍 iliar with the concepts and methods of mental psychology.

307 is recommended for anyone to do graduate study in psychology, students intending to study biology and
isite: Psychology 100 (honours stu-
Psychology 200 or Biology 1000 or two sychology $201 \mathrm{~A}, 202 \mathrm{~B}, 203 \mathrm{~A}$ (general

## Social Psych

ass concerns the study of individual our as a function of social stimuli with asis on extensive student research projects lass presentations. The class develops from
sion of research designs and methods to sudy of basic processes such as person tion, social comparison, and social ine, including behaviour within groups and elations between them. What determines mpressions we have of people, how we ate our abilities and emotions, how others
and beliefs and opinions, how de are made, and why people discriminate $t$ members of other ethnic groups are all which will be considered.
quisites: Psychology 100 (honours stuPsychology 200 or two of $201 \mathrm{~A}, 202 \mathrm{~B}$ general students).

Developmental Psychology, lect.: 2 hrs. hr.; T. R. Anders.
developmental psychologist is concerned the question of how behaviour is acquired
ined and altered over time. The answers to seed and altered over time. The answers to rearing, education and guidance, but the rest of the psychologist is directed first at mining the conditions under which be our begins and the conditions under which
ges take place. This leads some psy es take place. This leads some psy-
gists to basic studies about activity and scence, attentiveness, and indifference, and ons to positive and negative consequences.
leads others to questions about the develop ment of intelligence, what sensory experiences, what sensory experiences influence perception,
and how the child acquires such immensely complicated behaviours as those involved in speech and concept formation.
The class is experimentally oriented. Through out, the emphasis is on learning and transfe operations with less stress on physiological and maturational processes. Because the class is intended for students with some background in experimental psychology, it deals in depth with
such topics as paired associate learning uch topics as paired associate learning
imagery, selective attention, transfer, and be magery, selective attention, transfer, and bo traditional topics such as language acquisition, perceptual and cognitive development, and itellectual and social processes. rerequisites: Psychology 100 (honours stu203 A (general students).

312 Experimental Analysis of Behaviour Diso ders, lect.: 1 ¹/2 hrs.; tutorial: $1^{1 / 2 / 2}$ hrs.; W. K Caird, J. P. Wincze.
sychology 312 is concerned with an examina tion of neurotic and psychotic disorders from he general purpose of the class is to oresent to he students current psychological thinking egarding behaviour disorders; what the major problems are and the ways in which attempts
are being made to solve them. It is primarily intended for honours students and those in tending to do advanced work in psychology.
his class is largely descriptive and of a fairl broad nature. The concern is with topics suc s: the hypothesized biological and psycholo various models for the study of these; the ationale and utility of diagnosis and classification; experimental methods of research into behaviour disorders; behavioural descriptions of neurotic, psy chotic and character disorders and ing and explaining these patterns of behaviour.

There are detailed discussions of the manipula tive aspects of abnormal psychology - by drug and various types of reinforcers. The majo interest is the modification of behaviour by th perant conditioning techniques with schizo phrenic patients; desensitization with phobic patients; aversion-type procedures with obse sive-compulsive disorders; modeling techniques with childhood behaviour problems; and conditioning procedures with alcoholism, dru
addiction and similar disorders.

The tutorial will consist of weekly meetings where current and/or contentions issues will be discussed. To facilitate an exchange of ideas ach tutorial session will be limited to 10 students.

Students intending to enrol in Psychology 312
should have a clear understanding of 'some of
the fundamental concepts of psychology and human physiology. In particular, they shoul ing and learning, motivation and perception.
They should also understand the fundamentals of autonomic and central nervous system ood introductory psychology text (e.g., G.A. Kimble and N. Garmezy: Principles of Genera Psychology, 3rd ed. 1968) is necessary if th
tudent is to derive benefit from the class. tudent is to derive benefit from the class. rerequisite: Honours students or general sta
dents who have credit for Psychology 200 and wo of 201A, 202B, 203A.

313 Cognitive Processes, lect.: 3 hrs.; Earhard.
child enters this world without a memory thought or language - with only the require Went that certain basic needs be satishep Whthin two years, a child has a well-develop s the capacity to communicate verbally wit thers. Cognitive psychology is not concerne mith providing a description of the devel character of mechanisms that must underly such human abilities. Cognitive psychologist ask such questions as: How does an individua recognize an object when it is in differe contexts or orientations, when each shift
position or orientation produces a different pattern of stimulation on the eye? How much of daily experience is committed to permanen nemory, and by what processes is it memo ized? How is information stored in memory, and how is information lost from memory? general, it can be said that cognitive psychology mechanisms to account for thought and lan guage in the human organism. Prerequisite: Psychology 100 (honours stu
dents); Psychology 200 or two of $201 \mathrm{~A}, 202 \mathrm{~B}$, dents); Psychology 200 or two of 201A, 202B
203A (general students). 203 A (general students)
353B Philosophy of Science and Experimenta Psychology, seminar: 2 hrs.; W. K. Honig, Rosenberg.

An examination of methodological and conceptual issues in experimental psycholog. Topics treated include the character of explan
tions, general statements, theories and theo etical entities in empirical psychology, as well as particular issues in current research pro grammes: concept-formation in non-human perception studies, computer-simulation. Kea ings from the works of contemp chologists and philosophers.
Psychology beyond the 100 level, or consent of instructor.
356 Advanced Morntin hrs.; P. J. Dunham.

The topic of motivation is one of the mot dificult to describe in psychology. The materi1 which appears in the standard textbooks
motivation could easily have been placed in a textbook on learning, on perception, on perogy. Because of the breadth of the subject matter, Psychology 356 is taught as a seminar dealing with selected topics in the area dealing with selected topics in the area of
advanced motivation. In addition to these special topics discussed in class, outside re adings are assigned to familiarize the student with the various classic issues which have persisted in the history of thought about
motivation. ${ }_{\text {motivation. }}$ Prerequisite:
Prerequisite: This class is primarily intended for admitted with the consent of the instructor.

357 Statistical Methods in Psychology, lect.: 2 hrs.; lab.: 2 hrs.; M. Earhard.
The object of this class is to familiarize the student with the logic and application of the
descriptive and inductive statistical methods that are commonly used in the analysis of data in experimental psychology. The material covered begins with the topic of frequency
distributions and their characteristics and prodistributions and their characteristics, and pro-
gresses through parametric and non-parametric tests of significance, 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 consideration, then discussing the general
method of attacking the questions asked of the data, and finally working through specific problems in class. The classes are conducted as a combination of lectures and labs, and students are encouraged to participate actively
and question often. and question often.
sychology 357 is required for honours psy chology 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 suc-
cessful 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.
$P_{\text {rerequisite }}$. This
Prerequisite: This class is primarily intended for
honours students, but other students will be admitted with the consent of the instructor

358 History of Psychology, lect.: 3 hrs.; J. W Clark.
The emphasis in this seminar class is on the evolution of thought about a number of psychological issues that have been of central
concern throughout the history of psychology concern throughout the history of psychology:
the localization of function in the brain, the principles of association in learning, the nature of intelligence, the evolution of behaviour, the
measurement of sensation, the development of measurement of sensation, the development of
perception, the causes of abnormal behaviour, etc. Speculation on such issues is traced from antiquity to the emergence of experimental psychology in the nineteenth century, and their development is examined in the work of the
major psychologists. Structuralism, function chologh the byavism, Freudianism, Gestalt psy chology's first systematic viewpoints of psy chology s first century - are also
the writings of their proponents.
Preegrite
Prerequisite: This class is intended for honours
students, but other students with the consent of students will be admitted

450 Physiological Mechanisms in Animal Be haviour (Sensory Physiology), lect.: 1 hr.; lab.: 4 hrs.; M. G. Yoon.
This laboratory class provides first-hand knowledge of sensory mechanisms in perception and in nervous control of behavior. Emphasis is on principles and application of modern electrophysiological techniques to the study of sensory system.

464 Ethology, lect.: 2 hrs.; lab.: or field work: 3 hrs.; F. J. Mortenson.

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.
Prerequisites
Prerequisites: Honours and qualifying year
students, or consent of instructor
465 Honours Thesis, Members of the Depart-
Psy
Psychology 465 is designed to acquaint the student with current experimental problems chology. 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 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 ${ }_{P}^{\text {project and }}$ upon the submitted report.
Prerequisite: Restricted to honours students in
their graduating year.
470 Animal and Human Learning, lect.: 2 hrs.; B. R. Moore

This class deals with selected aspects of Pavlovian and operant conditioning, avoidance conditioning and punishment, discrimination learning, shor-term memory, interference effects and forgetting. The techniques and
control problems of the various areas are examined in sufficient detail to allow the student to evaluate critically the experimental literature. Certain of the areas are considered within the context of contemporary theories; in ther cases the approach is theoretical.

The format of the class varies. Lectures, brief student presentations, extended presentations and group discussion are intermixed according to the nature of the material to be covered. No
formal text is us
primary sources.
The seminar is required of all and qualifying-year graduate stude ordinarily not open to others. The student who has not taken a previo learning and conditioning should
reading The Psychology of reading The Psychology of Learning b
and S. H. Hulse (McGraw-Hill, comparable work. A detailed kno such a text is not assumed, but th should be familiar with the technic lary and the major techniques and pl
described. described.
herequisite: The class is primarily in admitted with the consent of the instr
500 Research Assignment, Member Department.

The student is assigned to an on-goin project and works under the direction o
member. The student is required to report, written in thesis form, of completed during the year.
Prerequisite: Restricted to qualifying
dents. dents.
Graduate Studies
Courses leading to the M.A. and Ph.D.
in psychology are offere.. Further de
graduate courses and general requirem graduate courses and general requirem
admission to graduate study may be admission to graduate study may be
the Calendar of the Faculty of Studies.

## $\underline{\text { Religion }}$

Wilfred Cantwell Smith (Chairman)
The study of religion as a phenom human history is the attempt to know interpret the data of religious life. The
tion is to achieve such knowledge interpretation as will do justice simult both to the meaning that the data have had $f$ those persons to whom they have be ligiously significant, and to the
tradition within whic tradition within which the university stult religion lies. The intellectural understandig
a more than intellectural reality in human lii constitutes a challenge; a successful rising would enhance human self-consciousn perhaps its most central point.
100 Introduction to Religious Man, hrs.; W. C. Smith.

A synoptic presentation of the major re interpret the faith inspired by them; w attention to representative and si
minor traditions. Prehistoric minor traditions. Prehistoric man and
"primitives"; the Hindu tradition Buddhist; other religious aspects of C Japan; the ancient Near East; and the J Christian, and Islamic traditions.

## -

hand Belief: A
hat
hrs. W. C. Smith
hrs.; W. C. Smith. ration of the possibility of a generic "faith" as intellectualizing an apuniversal human quality. Faith as
und alized classically in Buddhist, Hindu,
and Christian instances will be exand religious belief as conceptualized in modern Western thought. Through ons and contrasts the possibility will ed of perhaps understanding faith as a human (or religious) constant
nrolment. Prerequisite: knowledge of one classical scriptural language
Greek, Arabic, Sanskrit, Chinese, preferably two; some philosophy or religion, preferably both.

## Professor

in, Chairman

## Professor

ssian language has the same origins as French and German, and it is, in neither easier nor more difficult for the
to than the other languages which are taught in university. Students who introductory class at Dalhousie be-
ficiently conversant with the language able to make themselves understood in tries where Russian is the first or second and, with occasional assistance from a ary, they can read most of the editorials vda and appreciate some of the satire in
dil. By taking more advanced classes, one dil. By taking more advanced classes, one
ecome fluent in the language, and thus ecome fluent in the language, and thus
direct access to Russian literary, political ientific thought. The advantages of being find out for oneself what the representasome 200 million people say are

## Degree Programmes

may be tars in a modern languages may be taken in a modern languages
nguage laboratory is open more than 50 a week (including some evenings) and
ts have a wide selection of times at which oral assignments can be completed. Adconversation classes are offered for who wish to speak Russian fluently.
of the Russian Department are enof the Russian Department are enClub (drama, singing and dancing).

## Classes Offered

Nentary Russian, lect.: 3

This class is designed for students who have no previous knowledge of the Russian language.
Since Russian is an inflected language, the study of grammar is introduced along with ora work so that the student begins to speak right
away. Reading Russian does not create any away. Reading Russian does not create any
difficulty since the alphabet is phonetic.

The class is a credit class, and since Russian is not taught in Nova Scotia high schools, it is of ten taken by students who have not acquired a sufficient knowledge of other modern langu ages taught at the University

200 Second Year Russian, lect.: 3 hrs.; Natan Nevo.

This is a continuation of Russian 100. Th study of Russian grammar is completed and emphasis is placed on oral work. Additiona conversation classes are given by the instructor fpeaking Russian.

201 Scientific Russian, lect.: 3 hrs.; Natan
This class is designed for science students. The study of Russian grammar is continued but emphasis is now placed on the reading of
scientific texts. At the completion of the class a science student should be able to translate scientific texts with the aid of a dictionary. rerequisite: Russian 100.

300 Area Studies, seminar; Irene Coffin
This class is a study of the geography and history of Russia from its beginning to the present time. The class is conducted as a express their thoughts in Russian.
Prerequisite: Russian 200 or 210 .

301 C
Coffin.
he year. Each student will be required to prepare a paper on a literary topic Prerequisite: Russian 200 or 201 or any equivalent achieved at any other university an recognized by Dalhousie University

304 Russian Culture and Civilization, 2 hrs Nicholas Maloff, offered in 1974-75.
his class traces the development of Russian culture and folklore from their earliest origins o the present day and their influence on art rchitecture and music. Numerous masterpiece vill be illus

## 05 Soviet Literature, (offered in 1974-75),

 rrs.; Nicholas Maloff.his class is designed to acquaint the stude with the best works of the Soviet authors to th present day.

306/A Dostoevsky (New course offering fo 1973-74), lect.: 2 hrs.; N. Maloff. Open to tudents in all departments. No prerequisites

This course is designed to give the student a insight into Dostoevsky's creative work throug an analysis of his major works. Classes a onducted in English.
"Man is a mystery: if you spend your entire life trying to puzzle it out, then do not say that
you have wasted your time. I occupy myself with this mystery, because I want to be a man. From Dostoevsky's letter to his brother (1839) Dostoevsky takes his rightful place among the great writers of world literature: Dante
Cervantes, Milton, Pascal and Tolstoy. Lon efore Freud and the school of psychoanalyst Dostoevsky analysed the depths of the subconscious. Yet psychology for him was not an end
but a means. He remarked: "I am called a psychologist; this is not true, for I am a realist in the highest sense, i.e. I depict all the depth of the human soul."
his class is designed to develop the student speaking ability about commonplace subjects
and situations. The students are required to ead articles in Russian papers and magazines hich enlages Rusian 200 or 201, or by rrangement with the instructor.

302 and 303 Russian Literature, (offered in alternate years), lect.: 2 hrs.; Natan Nevo.
This is a general class in Russian prose, poetry and literary criticism, whose purpose is to help structure of the Russian language to deepen his knowledge of it and its literature and to trengthen his audiolingual skill,
The class will acquaint the student with biographical sketches and selected works of well known Russian authors of the 19 th and
20 th centuries. Discussions will be held in both Russian and English. Essays will be given, during

The existence of God has also "tormented" $h$ entire life and he foresaw history in the light of he Apocalypse to be culminated in the ransfiguration of the world by the "new and last Resurrection"

306/B Tolstoy, (New course offering for 973-74), lect.: 2 hrs.; N. Nevo. Open tudents in all departments. No prerequisites.
This course is designed for students wishing to deas through acted with Tolstoy's thoughts and Classes will be conducted in English.
Tolstoy and Dostoevsky are the two great columns, standing apart in the proplaeum o he Russian literature Golden Age temple.
seems Tolstoy has been given to the world $f$ the purpose of being "contrasted with Dostoe

Indeed Dostoevsky is considered the "surgeon of the hunity
Tolstoy's talents and genius enabled him to capture the search for identity in 19th century
Russia and to interpret it through his own solipsism - a sense of being the great world he writes about. For him self-awareness among all people should be based on "reason, that is, good
400 Advanced Russian Conversation and Composition, 3 hrs.; Nicholas Maloff

This class is conducted as a seminar and is a continuation of the Russian 301. Prerequisite: Russian 300 or 301 , or by arrangement with the instructor

Sociology and Anthropology
Sociology
Professors
S. D. Clark

Associate Professors
D. Q. Brodie
D. F. Campbell
D. H. Clairmon
D. H. Elliott
J. L. Elliott
H. V. Gamberg
J. G. Morgan (Part-time)
V. Thiessen

Assistant Professors
G. D. Bouma
P. G. Clark
D. J. Grady
N. W. Poushinsky
R. E. Schliewen
J. D. Stolzman

Visiting Professor
L. C. Freeman
L. C. Freeman

The sociologist is concerned in general with the growth and development of societies to
modern, complex industrial units. Within modern, complex industrial units. Within any
particular society, sociologists may analyze the distribution of wealth, power and prestige, problems of conformity and non-conformity, and social problems such as crime, racism, suicide, overpopulation, or the development of personality.

As part of a liberal arts education, sociology teaches the student to think critically about problems which are part of his own society.
His or her willingness to think about the reasons for racial prejudice, poverty, or war, should be increased by exposure to this field.
The career possibilities in sociology include The career possibilities in sociology include
research in government, industry, or university and teaching at the university level.
ormally a prerequisite for all advanced classe in the department. The content of this class is specially designed to provide students conolid foung concentration in sociology with a field. Multiot for subsequent study in the field. Multiple sections will be offered and sion in small tutorials. Sociology 105 and 110 are also introductory in character, but thei content is tailored for students who do not intend to concentrate in sociology. Enrollment in one of these latter classes does not preclude later entry into advanced classes. 200-level
classes include all the classes normally taken y students concentrating in sociology 300 -level classes are structured primarily a seminar courses and ordinarily presume a fair degree of familiarity with the discipline lo hasses are restited to hono students and qualifying graduate students.

## Anthropology

## Professors <br> L. Kasdan

W. N. Stephens

## sistant Professors

F. H. Barkow
R. Larsen

## Research Associate

C. R. Hallpike

Anthropology consists of four subfields archaeology, anthropological linguistics,
physical anthropology, and social/cultura anthropology. Most of the class offerings in anthropology in the department fall into the (though the student will be introduced to all of the subfields in Anthropology 100) Social/cultural anthropology is the study of culture and social organization. It has affinities with several other social science dis-
ciplines, including economics, history political ciplines, including economics, history, political
science and sociology. Formerly social science
cultural
and sociology.
anthropologists $\begin{gathered}\text { Formerly, social } \\ \text { were } \\ \text { interested }\end{gathered}$ primarily in small-scale, mostly non-literate societies, studying them by "participant observation" and comparing aspects of culture and social structure. In recent years, anthro-
pology has applied its methodological and pology has applied its methodological and
theoretical perspectives to such diverse areas as mental institutions, urban life, and governmental regulatory agencies.
A background in anthropology provides broad view of the human animal, his diverse
cultures and his biological an orientation is an antidote to provincialism and an invaluable perspective for interests and studies in the other social sciences, the humanities, psychology, and the biological, medical and legal disciplines.

Anthropology 100 is normally a prerequisite for 200 and $300-$-level classes in the depart-
ment. Exceptions to this general rule are ment. Exceptions to this general
noted in the class descriptions below.

Degree Programmes
Sociology and anthropology are proved fields for concentration. In
the department offers honours progra sociology and anthropology.. A quired, preparation for most advanue sociology and anthropology. students are invited to contact the graduate Advising Committee (sociol anthropologists on staff (anthropol for both programmes. Normally ${ }_{y}$ re for honours study is made on the bap results of the second year, i.e., towards of your fourth semester. Study sp limited financial support are availa honours students.
B.A. with Honours in Sociology The nine sociology classes above
troductory level required for the degree should include statistics (301), methods (310), two classes in theory $405 \mathrm{~A} / \mathrm{B}$ ), and the honours seminar 4 eminar paper produced in 450 will mined as an honours thesis, to be prese n open meeting. This will fulfill the un sive examination covering his honours order to receive an honours degree.
Combined and Unconcentrated Honour The combined honours programme taken with economics, political ramme as well as the unconcentrated programme (cf. p. 12), an early consult instructors and the Undergraduate A essential.
B.A. with Honours in Anthropology Nine credits in anthropology above 452, 453, and 459. Anthropology 459 two credits and consists of the writing supervision of an honours thesis. The the anthropology staff. Applicants programme are asked to contact Profe Kasdan, its coordinator. Admission is pon a personal interview and the exan of any paper which the applicant fe admission to the wring ability. student must select one faculty mem serve as his principal advisor. In with university regulations, a student $m$ a comprehensive examination covering honour
degree.

## Sociology Classes Offered

## 100 Introduction to Sociology, lect

 Poushinsky, R. Schliewen.socioragy 10 is designed to provide
as well as a foundation for more ed study in the field. Emphasis in this ,ill be placed on basic sociological s, the nature of the sociological perspeclogic of social inquiry, and recurrent cal and methodological problems of the ne. In addition, students will be exposed
ney of some of the maior fields within rvey of some of the major fields within concentrate in sociology who are about their long-range interest in y are advised to enroll in this class tan 105 or 110.
Societies, lect.: 2 hrs.; tutorial: . Stolzman.
introduction to sociology as a e. The first half of the course will an overview of the concepts, problems eoretical perspectives which are central of the course will primarily b ed to show how the study of sociolog ant to an understanding of the structure dynamics of contemporary Western This class is offered for arts and science It who do not presently intend to pursue
study in sociology. The class is not open study in sociology. The class is not ope
dents who have previously take gy 100,110 , or Anthropology 100.

gy, lect.: 3 hrs.; D

designed exclusively for non-arts and students. The first part of the class will to convey a general appreciation of the gical approach to human behavior. The ing portion of the class will then or to apply this approach to areas of
activity that are of special interest to activity that are of special interest sho have previously taken Sociolog hropology 100.

## mparative Analysis of Social Systen

 ered in 1973-74).eviance and Social Control, lect.: 2 hrs . al: 1 hr.; D. Campbell.
make formal and informal rules in an
to regulate and make predictable th or of their members. Violations of these
cour in many different ways and stem various causes. The purpose of the class is amine both the processes by which groups erules and the reasons why these rules are Specific issues such as crime, de ney, narcotic addiction, alcoholism, pro, suicide, and minority group relation

Scial Stratification, lect.:
1 hr .; P. Clark, H. Gamberg.
${ }_{2}{ }^{2}$ hrs.; dis-
class analyzes the principal aspects of nequality in modern, industrial society
rmation of classes, status groups and the d political expressions are considered.

Questions of the distribution of power and wealth in society, the existence of power elites on class relations, the extent to which major economic inequalities have been reduced in this century, problems of the mobility of in-
dividuals and 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 o contemporary theoretical approaches to stratification

205 Sociology of Religion, lect.: 2 hrs. tutorial: 1 hr.; G. D. Bouma,

This class analyzes the relations between religious beliefs and human behavior and social structure. Major themes include: the impact of 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 wion in western society A major paper is required.

206 Social Change and Modernization, (N offered in 1973-74).
207 Socialization, (Not offered in 1973-74).
208 Communities, lect.: 2 hrs.; seminar: 1 hr ; P. G. Clark.

Sociology 208 examines a wide variety of territorially based residential groupings. The emphasis in the first term is on such features of natural communities as the ecology, neighborbehavior in public settings. Both the rural village and the metropolis is dealt with, in addition to such sub-communites as ethnic ghettos, slums, suburbia, and bohemia. Emphasis in the second term is on intentional communities such as utopian colonies, com-
munes, company towns, and religious communities Students are expected to design a model of an intentional community

211 Canadian Society, lect.: 3 hrs.; D. H
The social significance of such population processes as immigration and migration will be considered in an attempt to develop a general
perspective on the Canadian society. Social systems within Canda will be analyzed with respect to the social determinants of class, status and power.

212 Minority Groups, lect.: 2 hrs.; tutorial: 1 hr., J. L. Elliott.
The social status of minority groups will be examined in the light of contemporary theories
of prejudice and discrimination. The societal 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.
213A Complex Organizations, lect.: 2 hrs, tutorial: 1 hr .; R. Schliewen

This class makes a critical study, from the comparative point of view, of theoretical models for the analysis of complex organizaions. Students will examine the classical, science approaches to and management will entail a systematic survey of the sociological literature on this subject, with special concentration on organizational structure, strategy and decision-making

214B Industrial Sociology, lect.: 2 hrs.; tutori al: 1 hr.; J. D. Stolzman.

Recommended preparation: Sociology 204 or 213A. This class will examine the social relations of industry at both the micro- and macrosociological levels of analysis. The course will deal primarily with the productive system and attendant industrial institutions of
advanced capitalist society Major topics for investigation include the industrialization process, the social structure of industry, the development of trade unionism, and the socio logy of work relationships. Evaluation will be based on examinations and a term paper.
215 Mass Society, lect.: 2 hrs.; lab.: 1 hr.; D. H. Elliott.

This class deals with the origin of modern, post-industrial "mass society." Problems as sociated with industrialization, cybernation, tion are examined in detail. Various attempts at solution of these problems are analyzed. The rise of the "expert" and of counter-cultural movements are given particular attention Theoretical and methodological innovations for "future forecasting" are introduced. The grade for the class will be based upon two examina-
tions and several papers. This course is not open to students who have previously taken Socio logy 215 A or 215 B .

216B Sociology of Occupations, lect.: 2 hrs tutorial: 1 hr.; G. D. Bouma

This class analyzes several social processes basi to occupational careers, professionalization and formal organization of occupations. Thes processes are treated in the context of thei tions and for the relations between occup ons and both social structure and huma 217 Political Sociology, lect.: 3 hrs.; D. J. Grady.
This class reviews the findings of social scienc on the issues of political systems, and seeks to account for the uses and abuses of influence and social control in societies. Emphasis is upo comparative study, utilizing the general perameters of political power in national politica
systems with applications designed for the 307 Socialization Processes, seminar: 3 hrs.; $V$ Atlantic region.
220 Sociology of the Family, lect.: 2 hrs.; tutorial: 1 hr.; J. J. Mangalam

Family in one form or another is an aspect of all societies. It is the most important agent of early socialization and personality formation,
The first part of the course will be devoted to consideration of some of the cross-societ characteristics of family in general, and of the ties in particular. The second term will be devoted to a consideration of family character istics in urban-industrial societies, concentrating on the nuclear family. An attempt will be made o understand the processes by which family structures and fuctions have changed through an urban-industrial social organization.

22 Social Psychology, lect.: 2 hrs.; tutorials. hr.; V. Thiessen.
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, ect.: 2 hrs.; tutorials: 1 hr. ; J. G. Morgan, R.
Schliewen.

The class provides a systematic introduction into major topics in sociological theory. Part (Morgan) treats classical concepts with re
ference to theorists up to 1920 (Saint-Simon, Marx, Weber, Durkheim, Pareto, etc.). Part 2 (Schliewen) outlines more recent developments omans, Dahrendorf, 'formal' theorists, oundary problems between sociology and other social sciences will be identified, and ways in which theorizing has informed em-
pirical research will be discussed.

301 Statistics, lect.: 3 hrs.; N. W. Poushinsky
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 sciences. 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, seminar 3 hrs.; D. H. Clairmont.

This 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 research, to the development of policy relevan
to the problem and considers issues in problem of implementation of policy.

306 Sociocultural Change, Modernization, an Development, (Not offered in 1973-74).

An analysis of how individuals and groups develop and change their behavior, thought, attitude and emotional patterns.

308 Experimental Analysis of Social Behavior (Not offered in 1973-74)

310 Research Methods, lect.: 3 hrs.; D. Q. .
This class is concerned with the construction and testing of "grounded theory." A detailed stages of social research is presented. The topics discussed in the class include the construction of theory, the formulation of a research problem, 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. Class organization: During the first half of the class
material is presented in two lecture sessions and material is presented in two lecture sessions and the second half of the class participants participate in research team approach to a problem. Method of evaluation: First term; two examinations and laboratory assignments. Second term; participation and discussion and a final research pape

311 Sociology of Leisure, (Not offered in
312 Social Conflict Theories, (Not offered in 1973-74

313A Sociology of Health and Illness, seminar: 3 hrs.; J. L. Elliott.
Beliefs and attitudes surrounding disease concepts and treatment will be examined in primitive and contemporary societies. In addi-
tion, the social organization of medicine will be analyzed with respect to the following: the health professions, the hospital as a complex organization, and the larger society.
1973-74).
Urban
Sociology, (Not offered in
offered in 1973 of Higher Education, (Not
317A Comparative Political Sociology, (Not

18A Issues in the Theory of Society, seminar: Hr., H. Gamberg and J. D. Stolzman.
This seminar will consider a select number of heoretical issues which beset modern socia be on the social basis of politics in the contemporary world. All students enrolled in the course will be expected to make one eminar presentation

319B Social Movements, seminar: 3 a Grady.

This seminar examines both
(formal) (formal) and contemporary (action) app
to social movements to social movements - viewed as eff
individuals and groups to chall individuals and groups to challenge
values, social institutions and/or order. Focus is upon participant obse with particular attention to develo
Nova Scotia and the Atlantic region.

320 Social Change and the Canadian seminar: 3 hrs.; S. D. Clark.
The primary interest of this course examination of the way in which the
society has changed, particilarly in society has changed, particularly in
since the Second World War. Before taking such an examination, however is made to develop a general framewo analysis of the process of change in Change in the Canadian society is amined within such a framework: how
order" of Canadian society became order of Canadian society became est
how powerful forces of change in how powerful forces of change in th
deved after the Second World shape now being taken by the society are advised to read in advance S. D. - Conadion Communiy.

## Mangalam.

Sociology is the study of the proc the study of population emphasizing birth, death and migration. Thus mography is the study of the inter relationships between the processes
ducts of interaction on one ducts of interaction on one hand, and $f$
birth, death and migration birth, death and migration on the o
attempt will be made to include discussions such topics as world po sociocultural factors influencing p size.

325 Sociology of Science and Ideas,
hrs.; tutorials: 1 hr .; D. H. Elliott.
Tr., tutials. 1 hr., D. H. Eliot.
The study of the social origins and orga
of knowledge is an important aspect of knowledge is an important aspect
temporary sociology. This class introdu student to the major elements of the of knowledge. The class is particula cerned with the examination of the knowledge known as modern scienc
historical origins of science will be dis The social organization of contem scientific research will be examined empirical data. The interaction betw scientific community and society-at-la be analyzed; particular attention shall
to questions of science policy The rela to questions of science policy. The rela between modern technology and conten
scientific research will be studied ticular reference to the impact of information processing technology
nt of social science. The class evaluaill depend upon both papers and exe previously taken Sociology 209A or
inar on Family and Socialization, (Not minar on Fam
in 1973-74).
listory of Sociological Thought. Staff.
ntemporary Sociological Theory I.
ntemporary Sociological Theory II.
irs Seminar in Sociology. Staff.
has two parts; part one covers basic ss has two parts, part one covers basic cience. Part two applies these concepts oncrete research project of the student's The emphasis will be on oral presentassignments and repeated mutual review sals and papers.

Readings in Sociology, Staff.
Readings in Sociology, Staff.
eadings in Sociology, Staff.
ding course the student is assigned to a of staff for regular meetings to discuss in a selected area. Papers and research will be expected.
Anthropology Classes Offered
oductory Anthropology, lect.: 3 hrs.; en, W. Stephens.
urse is intended to introduce students to fields of anthropology and is intended eld. In the first term, students will be ced to man's evolutionary past, his nship to other species of primate, his al structure, and some of the biological involved in his socio-political behaviour. second term, cultural evolution will be
from hunting bands from hunting bands, through tribes, ialized states. The primary mode of s will be ecological, i.e., how the pment of these societies has been pardetermined and limited by the environerms films will be used to present examples for analysis.

Ultural Ecology, lect.: 3 hrs.; R. Larsen.
cus of this course will be the contribuand patterns of social organization and patterns of social organization.
ationship between subsistence patterns cial organizational choices will be exattention will be directed to
problems of understanding how complexes of cultural traits operate in maintaining a balance
between a population and its subsistence resources. The emergence of particular complexes of traits and their existence at specific
points of time and place will also be discussed points of time and place will also be discussed
Class will be a combination of lectures and seminar, and two term papers are required.

220 Social Anthropology, lect. 3 hrs. Kasdan. pecies traits and are the product of a
evolutionary process. Although the range of opics proposed for discussion is eclectic, the core of the course is a focus on the biological bases of socio-political organization. Topics t be discussed include evolutionary principles, he evolution of man and other primate, primal behaviour sex differences, and the biology of politics. The format of the class will be a combination of lecture and seminar, and grades will be determined on the basis of eithe two term papers or a research project.

316 Africa: Ethnography and Modernization seminar: 3 hrs.; J. Barkow.

This class introduces the student to the anthr pological study of the peoples of Africa. Th lass is organized in terms of subject areas ather than ethnic units or geographic region sopics to be discussed during the autumn family and social organization, economics an livelihood, politics and government, and per sonality and socialization. During the spring semester our focus will be on contemporary ather than colonial or pre-colonial Africa. The tion on urban and rural life. A paper will b required.
Prerequisite: Anthropology 100 or written per mission of instructor.
20 Readings in Anthropology, Staff
Prerequisite: written permission of instructor

330 The Family and Socialization in Cros cultural Perspective, (Not offered in 1973-74).

31 Cross-cultural Study of Socialization, lect 3 hrs.; W. Stephens.

In this course the student will (1) be introduced o the cross-cultural research method, i.e., the testing of general hypotheses on large samples of ethnographic cases, with the analysis, in ectures and in readings, of selected crossexpert on the ethnographic literature on one o he world's major culture areas (Latin America Europe, Middle East, Africa, Southeast Asia, or hatever) as it treats the problem - the effec of modernization on adolescence - which wil e the class research problem for 1973-74. The participate in one or more (probably two) ross-cultural investigations.
rerequisite: Anthropology 100 or permissio of the instructor.
451 Proseminar in Anthropology, Staff.
ntensive examination of major issues in anthro pology. The first part of the class is devoted to survey of major issues current in the fied

## 280 Acting 1, 6 hrs.

The first full time class involving work in movement, improvisation, role playing, voice
and speech, and scene study and speech, and scene study.

301 Introduction to Film, 3 hrs.
An introductory class for students with no background in film. The class is run with weekly screening and analysis of film. It and techniques, and requires extensive viewing and techniques, and requires extensive
of films outside those shown in classes.

## 360 The Playwright in the Theatre, 6 hrs .

This class is concerned with the creation of heatrical events, usually, but not necessarily on the basis of a formal written script. It doe not deal with the printed or spoken word
exclusively but rather with the total language of the theatre, as incorporated into a 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

## 371 Design 2, 6 hrs.

An examination of two dimensional design, colour composition,
dimensional design.
380 Acting 2,6 hrs.
Advanced work in acting involving movement role playing, character study, and scene work.

450 The Modern Theatre, 3 hrs.
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 implementation in particular plays and in theatrical practice will also be examined.

## 460 Directing, 6 hrs.

The procedures that lead to theatrical events are analysed in this class. Specific theories are explored and tested. The work in the clas involves directing scenes and one production.

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 he particular topic or project under stur 490 Dramatic Theory and the Aestheti Theatre, 3 hrs.

All of the arts face a profound problem ttempt to establish criteria which will
creative activity to be evaluated. This out to tackle that problem as far as the is concerned. It looks at the various hyy the and critical strategies that have been the hitherto, and attempts to judge their dere orth. It also asks what critical valu necessary for the survival and future growth
the theatre. Practical work will form the work of the group when it a part necessary to test theories in practice.

Drama in Education
The department of theatre is also r or Education 411 and partly for Education 414, classes offered in the B.Ed. programme courage the imaginative development hildren in elementary and secondary scho These classes are not available to undergraduate tudent

Graduate Studies
Graduate studies in theatre are not at pres vent will be glad to help students with bout opportunities for graduate study advice universities.

## UNIVERSITY OF KING'S collece

## CALENDAR 1974/75


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