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1967

University of Windsor General Calendar 1967-1968

University of Windsor

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University of WINDSOR

GENERAL CALENDAR

FACULTY OF
ARTS AND SCIENCE

SCHOOL OF NURSING
SCHOOL OF PHYSICAL EDUCATION

FACULTY OF
APPLIED SCIENCE

FACULTY OF
BUSINESS ADMINISTRATION

FACULTY OF
GRADUATE STUDIES

1967 · 1968

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PART ONE

UNIVERSITY OF WINDSOR

WINDSOR, ONTARIO, CANADA

and its

Federated and Affiliated Institutions

ASSUMPTION UNIVERSITY

HOLY REDEEMER COLLEGE

CANTERBURY COLLEGE

IONA COLLEGE

•

GENERAL CALENDAR
1967-68

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FACULTY OF ARTS AND SCIENCE

SCHOOL OF NURSING

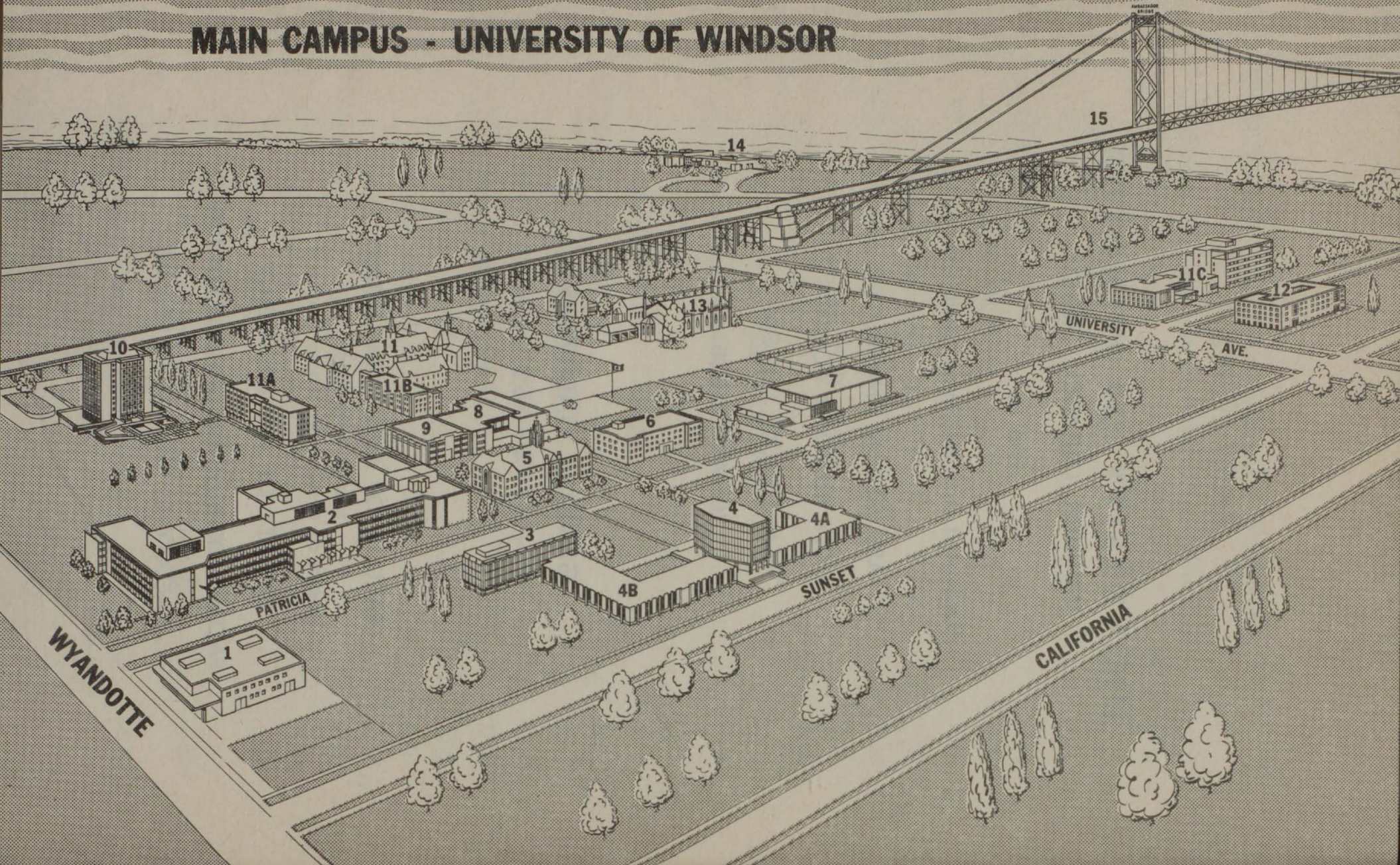
SCHOOL OF PHYSICAL AND HEALTH EDUCATION

FACULTY OF APPLIED SCIENCE

FACULTY OF BUSINESS ADMINISTRATION

FACULTY OF GRADUATE STUDIES

MAIN CAMPUS - UNIVERSITY OF WINDSOR



MAIN CAMPUS — UNIVERSITY OF WINDSOR

1 Temporary Fine Arts Building
(1951; 1966)*

2 Essex Hall
(Engineering, Mathematics, Chemistry, Physics; 1961; 1964)

3 Biology Building (1966)

4 Windsor Hall
(Administration Tower; 1965)
(a) North Academic Wing (1965)
(b) South Academic Wing (1967)

5 Dillon Hall
(Classrooms; 1928; 1957)

6 Memorial Hall
(Closed-Circuit TV, 1948; 1966)

7 University Library (1958)

8 University Centre (1962)

9 St. Denis Hall
(Gymnasium and swimming pool; 1915; 1948)

10 Men's Residence (1967)

11 Assumption University (1857)
(a) Cody Hall
(Men's residence; 1962)
(b) St. Michael's Hall
(Men's residence; 1915; 1960)
(c) Electa Hall
(Women's residence; 1958; 1963)

12 Canterbury College (1957)
Geoffrey Fisher Hall
Married Students and Faculty residence (1957; 1966)

13 Assumption Church (1728; 1874)

14 La Pointe House
(Basilian Fathers' House of Studies; 1965)

15 Ambassador Bridge to Detroit, Mich.

Not Shown:

Holy Redeemer College
(National Redemptorist Seminary; 1958; on Highway 3)

South campus
Track and athletic field, 1966
Natatorium; Physical and Health Education Building (1968)

**Where more than one date is given, the first refers to original construction, and the second to later renovation, addition or assignment.*

THE UNIVERSITY OF WINDSOR

is a full member of

The University Matriculation Board of Ontario
The Association of Universities and Colleges of Canada
The Association of Commonwealth Universities
The International Association of Universities

1967

JANUARY 1967

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SEPTEMBER 1967

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1968

JANUARY 1968

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JULY 1968

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SEPTEMBER 1968

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OCTOBER 1968

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DECEMBER 1968

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ACADEMIC CALENDAR

1967

June 24 (Saturday)	— Registration for summer session (local students).
July 3 (Monday)	— Registration for summer session (out-of-town students), and for graduate students.
July 6 (Thursday)	— Last day for summer session registration.
July 4 (Tuesday) to August 12 (Saturday) inclusive	— Summer session.
August 14, 15, 16 (Monday to Wednesday)	— Supplemental examinations.
September 4 (Monday)	— Labour Day (Statutory holiday).
September 5, 6, 7 (Tuesday to Thursday)	— Registration for undergraduate evening division, 7-9 p.m.
September 8 (Friday)	— Late registration penalty for undergraduate evening division begins.
September 11 and 12 (Monday and Tuesday)	— Counselling and orientation for new day undergraduate students.
September 12 (Tuesday)	— Registration for undergraduate day division: II, III and IV Year and Special students.
September 13 (Wednesday)	— Registration for undergraduate day division: all Freshmen and I Year students. Classes begin for students registered on September 12. Evening classes begin.
September 14 (Thursday)	— Classes begin for students registered on September 13.
September 15 (Friday)	— Counselling for graduate students.
September 16 (Saturday)	— Registration for graduate students (day and evening divisions).
September 18 (Monday)	— Graduate lectures begin (day and evening divisions).
September 20 (Wednesday)	— Registration for undergraduate evening division, 7-9 p.m.
October 4 (Wednesday)	— Last day of registration for fall session, day and evening classes.
October 9 (Monday)	— Thanksgiving Day (no classes).
October 18 (Wednesday)	— Senate Meeting.
October 21 (Saturday)	— Fall Convocation.
December 13 (Wednesday)	— Last day of first semester lectures.
December 14 and 15 (Thursday and Friday)	— Study period.
December 16, 18, 19, 20 (Saturday to Wednesday)	— First semester examinations.
December 25 (Monday)	— Christmas Day (Statutory holiday).
December 26 (Tuesday)	— Boxing Day (Statutory holiday).

1968

January 1 (Monday)	— New Years' Day (Statutory holiday).
January 3 (Wednesday)	— Second semester lectures begin; Registration for graduate day division, 9 a.m.-3 p.m.; Registration for graduate evening division, 6-8 p.m.
January 2, 3, 4, 5 (Tuesday to Friday)	— Registration for undergraduate evening division, second semester, 6-8 p.m.
January 8 (Monday)	— Late registration penalty for evening division begins.
January 24 (Wednesday)	— Last day of registration for second semester courses, day and evening classes.
February 12 (Monday)	— Senate Meeting.
February 19 to 23 inclusive (Monday to Friday)	— Mid-year recess.
April 5 (Friday)	— Last day of lectures, day and evening.
April 8 to 12 inclusive (Monday to Friday)	— Study period.
April 12 (Friday)	— Good Friday (Statutory holiday).
April 14	— Easter Sunday.
April 15 (Monday)	— Spring final examinations begin.
April 19 (Friday)	— Last day for submitting Ph.D. dissertations to Departments.
April 26 (Friday)	— Last day for submitting Master theses to Departments.
May 17 (Friday)	— Last day for oral presentations of theses and dissertations.
May 20 (Monday)	— Celebration of Victoria Day (Statutory holiday).
May 31 (Friday)	— Senate Meeting.
June 1 (Saturday)	— Spring Convocation.
June 22 (Saturday)	— Registration for summer session (local students).
July 1 (Monday)	— Dominion Day (Statutory holiday).
July 2 (Tuesday)	— Registration for summer session (out-of-town students), and for graduate students, 10 a.m.-4 p.m.
July 6 (Saturday)	— Last day for summer session registration.
July 3 (Wednesday) to August 10 (Saturday) inclusive	— Summer session.
August 5 (Monday)	— Civic Holiday (Statutory holiday).
August 12, 13, 14 (Monday to Wednesday)	— Supplemental examinations.

UNIVERSITY OF WINDSOR

BOARD OF GOVERNORS

Member ex officio:

J. Francis Leddy, D.Phil., D.Litt., D.es L., LL.D., D.C.L., **Vice-Chancellor and President**

Elected Members:

John J. Stuart, B.Com., **Chairman**
G. Malcolm Morton, B.A., M.D., M.Sc., F.R.C.S.(C), F.A.C.S., **Vice-Chairman**
Anthony F. Fuerth, K.S.S., **Chairman, Executive Committee**
William A. Cowan, Q.C.
Rev. D'Arcy L. Egan, C.Ss.R., S.T.L.
Eli C. Goldin, LL.D.
William T. Grant, B.Comm.
H. Clifford Hatch
William D. Howison, B.A., F.C.A.
Gordon E. Hunt
Raymond J. Lyons
Lieut.-Col. W. L. McGregor, Q.C., LL.D.
Frederick R. Palin, F.C.A.
Edwin R. Rowzee, M.Ch.E., D.Sc.
Ronald W. Todgham
William R. Waddell, M.D., F.R.C.P.
George R. Weller

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Charles J. Clark, Q.C.
Rev. Cornelius P. Crowley, C.S.B., Ph.D.
Rev. D. T. Faught, C.S.B., M.A.
Rev. A. R. Howell, C.S.B., M.A.Sc.
Rev. Daniel J. Mulvihill, C.S.B., Ph.D.
Rev. Norbert J. Ruth, C.S.B., M.A.

Members Appointed by the Alumni Association:

Joseph R. Deane, LL.B.
James A. Holden, B.A.

Members Appointed by the Lieutenant Governor in Council:

Alphonse Gignac
Richard A. Graybiel, B.A.
Jerome R. Hartford, B.A.
Clare R. MacLeod, B.A., B.Paed.

ASSUMPTION UNIVERSITY

Federated with the University of Windsor

Rev. Eugene R. Malley, C.S.B., B.A., M.A., S.T.L., S.T.D., **President.**
Rev. Timothy Hogan, C.S.B., B.A., M.A.(Theol.), **Chaplain.**

BOARD OF GOVERNORS

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Rev. Donald T. Faught, C.S.B., M.A.
Rev. Norbert J. Ruth, C.S.B., M.A.
Rev. C. P. Crowley, C.S.B., Ph.D.
Rev. E. C. Pappert, C.S.B., Ph.D.

HOLY REDEEMER COLLEGE

BOARD OF DIRECTORS, OFFICERS

Very Rev. J. D. Scanlan, C.Ss.R., B.A., Rector, **President.**
Very Rev. John D. Lockwood, C.Ss.R., Provincial, **Vice-President.**
Rev. D'Arcy L. Egan, C.Ss.R., S.T.L., Principal, **Secretary-Treasurer.**

CANTERBURY COLLEGE

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The Rev. Henry Hill, B.A., M.A., L.Th., **Vice-Principal.**
The Rev. William N. Christensen, B.A., S.T.B., **Chaplain.**

BOARD OF DIRECTORS

The Right Reverend George N. Luxton, B.A., B.D., LL.D., D.D., Bishop of Huron, *Chairman.*
L. F. Ounsworth, M.Sc., *President.*
W. Glyn Rogers, *First Vice-President.*
R. R. Easton, B.A., Q.C., *Second Vice-President.*
A. E. Garrioch, *Secretary.*
Percy C. Graham, *Treasurer.*
The Rev. Canon R. C. Brown, M.A., D.D.
The Rev. Canon Bertram A. Silcox, B.A., L.Th.
The Rev. Canon J. G. Lethbridge, B.A., B.D., B.S.W.
The Rev. F. T. Kingston, M.A., L.Th., B.D., D. Phil.
The Rev. E. S. Wells, B.A., L.Th., B.D.
Luther C. Clarke, B.A.
Mrs. W. P. Fazackerley
J. R. W. Gwynne-Timothy, M.A., D.Phil.
J. A. Hall, F.C.A.
Gordon E. Hunt
Warwick Plumb
Thomas R. Roden, C.A.
W. A. Scott
Thomas L. Wickett, B.A.
Stuart Young, M.D., F.R.C.S.

IONA COLLEGE

The Rev. John Charles Hoffman, B.A., B.D., Ph.D., S.T.M., Th.D., **Principal.**
The Rev. Vernon E. McEachern, B.A., B.Div., Th.M., Th.D., **Chaplain.**

BOARD OF DIRECTORS

G. Alan Buchanan, B.A., *President*
Rev. Samuel R. Henderson, B.A., B.D., *Vice-President*
Joseph Ord, B.A., *Secretary*
W. Gordon Neely, *Treasurer*
Rev. William E. Aldworth
J. A. Baxter
Rev. William Bell, B.A.
Miss Daisy Bergoine, B.A.
William A. Cowan, B.A., Q.C.
Mrs. Roy Fraser
William J. Haydon, M.A.
Rev. J. Carman Hazelwood, B.A.
W. H. MacKay, C.A.
Rev. J. Delmar Martin, B.A.
Grant R. McCready, B.A.
Rev. Bruce Suitor
Rev. G. A. Wishart, B.A.

THE SENATE

Members ex officiis:

The Vice-Chancellor and President, *Chairman*
The Registrar, *Secretary*
The Executive Vice-President
The Academic Vice-President
The Dean and Associate Deans of each Faculty
The Director of each School
The Academic Heads of affiliated or federated Colleges
The Dean of Students
The Director of Extension
The Librarian
The Head or Chairman of each Department in the Faculties of Arts and Science and Applied Science

Elected Members:

Two members from the teaching staff of each Faculty, as follows:

Faculty of Arts and Science	— H. D. McCurdy, Ph.D. R. C. Nelson, Ph.D.
Faculty of Applied Science	— C. MacInnis, Ph.D. A. H. Qureshi, Ph.D.
Faculty of Business Administration	— J. M. Brownlie, M.B.A. C. M. Birch, Ph.D.
Faculty of Graduate Studies	— G. Szamosi, D.Sc. M. N. Vuckovic, Ph.D.

Appointed Members:

Two members appointed by the Alumni Association, as follows:
Michael Zin, Ph.D. (to October 1967)
Leon Z. McPherson, Q.C. (to October 1967)

OFFICERS OF ADMINISTRATION

Chancellor

Lieut. Col. the Hon. John Keiller Mackay, D.S.O., V.D., Q.C., D.C.L. (New Brunswick), LL.D. (St. Francis Xavier, Dalhousie, Ottawa, Western Ontario, Toronto).

Vice-Chancellor and President

John Francis Leddy, M.A. (Sask.), B.Litt., D.Phil. (Oxon.), D.Litt. (St. Francis Xavier), D.es L. (Laval), D.Lit. (Ottawa), LL.D. (Assumption, Saskatchewan, Toronto), D.C.L. (St. Mary's).

Vice-President

Frank A. DeMarco, B.A.Sc., M.A.Sc., Ph.D. (Toronto).

Vice-President, Administration, and Treasurer

William R. Mitchell, B.Sc.C.E. (Manitoba).

Dean of Arts and Science

Rev. Norbert Joseph Ruth, C.S.B., B.A., M.A. (Toronto).

Associate Deans of Arts and Science

William Gregory Phillips, B.A., M.A., Ph.D. (Toronto).
Roger Joseph Thibert, B.A. (Western Ontario), M.S. (Detroit), Ph.D. (Wayne State).

Assistant to the Dean

George Arthur McMahon, B.A. (Assumption), M.A. (Queen's).

Dean of Applied Science

James Gordon Parr, B.Sc. (Leeds), Ph.D. (Liverpool).

Dean of Business Administration

Gilbert Richard Horne, C.D., B.A. (Western Ontario), M.A., Ph.D. (Michigan).

Dean of Graduate Studies

Rev. Cornelius Patrick Joseph Crowley, C.S.B., B.A. (Toronto), M.A., Ph.D. (Michigan).

Associate Dean of Graduate Studies

Maurice Adelman, B.A.Sc., M.A.Sc., Ph.D. (Toronto).

President of Assumption University

Rev. Eugene R. Malley, C.S.B.; B.A., M.A. (Toronto), S.T.L., S.T.D. (Angelicum).

Principal of Holy Redeemer College

Rev. D'Arcy Lawrence Egan, C.Ss.R., S.T.L. (Catholic U. of America).

Principal of Canterbury College

Rev. Frederick Temple Kingston, B.A., M.A. (Toronto), L.Th., B.D. (Trinity), D.Phil. (Christ Church, Oxford).

Principal of Iona College

The Rev. John Charles Hoffman, B.A. (Toronto), B.D., Ph.D., S.T.M. (McGill), Th.D. (Union Theol. Sem.).

Director of the School of Nursing

Florence Martina Roach, R.R.C., Reg.N., B.Sc. (Seton Hall), R.R.L.

Director of the School of Physical and Health Education
Pasquale J. Galasso, B.A., B.P.H.E. (Queen's), M.A. (Michigan).

Director of Athletics (Men)
Richard James Moriarty, B.A., M.A. (Assumption), M.Ed. (Wayne State).

Director of Athletics (Women)
Elizabeth Thomson

Director of Extension and Summer School
Rev. Edward Cecil Pappert, C.S.B., B.A. (Toronto), M.A. (Detroit), Ph.D. (Ottawa).

Registrar
Barbara Helen Birch, B.A., M.A. (Western Ontario).

Admissions Officer
Rosary Ann Carney (Mrs. J. E.), B.A. (Western Ontario), M.S.W. (Wayne State).

Librarian
William F. Dollar, B.A., M.A. (Western Ontario), A.M.L.S. (Michigan).

Assistant Librarian
J. Emery Kanasy, B.Sc. (Assumption), A.M.L.S. (Michigan).

Executive Assistant to the President
John Edward Thompson, M.C., B.A. (Manitoba).

Awards Officer
T. Clement White, B.A. (Queen's), B.Paed. (Toronto), LL.D. (Queen's).

Dean of Students
(To be appointed).

Dean of Men
R. Paul Gilmor, B.A., M.A. (Assumption).

Dean of Women
Evelyn Grey McLean, B.A. (Assumption), M.A. (Wayne State).

Alumni Director
Roderick John Scott, B.Comm. (Assumption).

Secretary of the University and Board of Governors
John W. Whiteside, B.A. (Assumption).

Director of Engineering Services
Charles William Morgan, B.Sc. (Queen's), P.Eng.

OFFICERS OF INSTRUCTION

(The year of first appointment is given).

FULL TIME

Adelman, Maurice; B.A.Sc., M.A.Sc., Ph.D. (Toronto). Associate Dean of Graduate Studies; Professor and Head, Department of Chemical Engineering—1956.

Akeley, Rev. T. C., O.G.S.; B.A. (Johns Hopkins), L.Th., B.D. (Seabury-Western Theol. (Sem.), Ph.D. (Cambridge). Assistant Professor of Theology—1965.

Alexander, Rev. Arthur Edward, C.Ss.R.; Ph.L. (Fribourg). Assistant Professor of Philosophy—1957.

Alexander, Philip; B.A.Sc. (Assumption), M.A.Sc. (Windsor). Lecturer in Electrical Engineering—1964.

Atkinson, Harold R.; B.Sc. (Western Ontario), M.Sc. (Assumption), Ph.D. (Queen's). Assistant Professor of Mathematics—1964.

Babiy, George Borys; B.Sc., M.Sc., M.E. (Manitoba). Assistant Professor of Mechanical Engineering—1959.

Basic, E. Martin; B.S.E.E., B.S.M.E. (Illinois Inst. of Technology), M.B.A. (Western Michigan), Ph.D. (Michigan State). Associate Professor of Business Administration—1965.

Beckman, M. Dale; Th.B. (Canadian Nazarene College), B.Sc. (Alberta), M.B.A. (Western Ontario). Assistant Professor of Business Administration—1964.

Benedict, Winfred Gerald; B.S.A., Ph.D. (Toronto). Professor of Biology—1957.

Billinghurst, Robert Gordon; B.A.Sc., M.A.Sc. (Toronto). Professor and Head, Department of Engineering Materials—1957.

Birch, Cecil Mackintosh; B.A. (Western Ontario), M.A., Ph.D. (Toronto). Professor of Business Administration—1959.

Blackbourn, Anthony; B.Sc. (London), M.A. (Georgia). Assistant Professor of Geography —1963.

Boland, Rev. Frank John, C.S.B.; B.A. (Toronto), M.A. (Detroit), Ph.D. (Ottawa). Professor of History—1955.

Bounsall, E. J.; B.A.Sc., Chem. Eng., M.A. (Toronto), Ph.D. (Imperial College, London). Assistant Professor of Chemistry—1965.

Briggs, Elsworth Donald; B.A. (New Brunswick), Ph.D. (London). Assistant Professor of Political Science—1963.

Brightmore, Nancy; B.A., M.A. (Windsor). Lecturer in English—1966.

Brown, Jerome; B.A. (Iona College, N.Y.), M.A. (Toronto). Assistant Professor of Philosophy—1961.

Brownlie, John Maxwell; B.A. (Western Ontario), M.B.A. (Michigan). Associate Professor of Business Administration—1958.

Buchan, Peter Bruce; B.A.Sc., M. Comm. (Toronto). Assistant Professor of Business Administration—1963.

Bunt, Miriam Elizabeth; B.A. (Queen's), B.S., M.Ed., Ph.D. (Wayne State). Associate Professor of Psychology—1963.

Burrell, Peter R.; B.A.(Hons.) (Assumption), M.A. (Pennsylvania). Assistant Professor of Economics—1965.

Burton, Bruce Edward; M.Soc.Sc. (Hague). Assistant Professor of Political Science—1966.

Callaghan, Rev. John Francis, C.S.B.; B.A., M.A. (Toronto). Assistant Professor of Economics—1957.

Cervin, Vladimir Bohdan; B.A., B.Sc. (Vienna, Austria), D.S.S. (Brussels), Ph.D. (Prague). Professor of Psychology—1961.

Channen, Eric Wyllis; B.A.(Hons.), Ph.D. (Toronto). Associate Professor of Chemistry—1960.

Chrypinski, Vincent Casmere; M.L. (Catholic U. of Lublin, Poland), M.A. (Wayne), Ph.D. (Michigan). Professor of Political Science—1957.

Colborne, William George; B.Sc., M.Sc. (Queen's). Professor and Head, Department of Mechanical Engineering—1958.

Crowley, Rev. Cornelius Patrick Joseph, C.S.B.; B.A. (Toronto), M.A., Ph.D. (Michigan); Dean of Graduate Studies. Professor of English—1944.

Crowley, Rev. Edward J., C.Ss.R.; B.A. (St. Joseph's, New Brunswick), S.T.L. (Catholic U. of America), S.S.L. (Pontifical Biblical Institute, Rome). Associate Professor of Theology—1957.

*Culliton, Rev. Joseph Thomas, C.S.B.; B.A., B.Ed. (Toronto), S.T.B., M.A. (U. of St. Michael's College). Lecturer in Theology—1965.

Cunningham, Stanley B.; B.A. (Manitoba), M.A. (Toronto), M.S.L. (Pontif. Inst.), Ph.D. Toronto). Associate Professor and Acting Head, Department of Philosophy—1961.

Deck, John Norbert; B.A., M.A. (Western Ontario), Ph.D. (Toronto). Professor of Philosophy—1957.

DeLauro, Joseph Nicola; B.F.A. (Yale), M.F.A. (Iowa). Professor of Fine Art—1960.

DeMarco, Frank A.; B.A.Sc., M.A.Sc., Ph.D. (Toronto); Vice-President. Professor of Chemistry and Chemical Engineering—1946.

Dougherty, Rev. John Roger, C.S.B.; B.A. (Western Ontario), S.T.B. (St. Michael's, Toronto), M.S. (Cornell). Assistant Professor of Biology—1951.

Doyle, Robert Joseph; B.A., M.A. (Western Ontario), M.S. (Michigan State), Ph.D. (Wayne State). Professor and Head, Department of Biology—1948.

Drouillard, Rev. Clarence Joseph, C.S.B.; B.A., M.A. (Toronto), Ph.D. (Laval). Professor and Head, Department of Modern Languages—1956.

Egan, Rev. D'Arcy Lawrence, C.Ss.R.; S.T.L. (Catholic U. of America). Principal of Holy Redeemer College. Associate Professor of History and Theology—1957.

*On leave.

Eliopoulos, Hermes Andrew; B.Sc. (Salonika, Greece), M.Sc. (McGill), Ph.D. (Toronto). Professor of Mathematics—1956.

Faber, Seymour; M.A. (Michigan). Lecturer in Psychology and Sociology—1966.

Fallenbuchl, Zbigniew Marian; B.Sc. (Econ.) (London), M.A. (Montreal), Ph.D. (McGill). Professor of Economics—1957.

Fantazzi, Charles; A.B., M.A. (Catholic U. of America), Ph.D. (Harvard). Associate Professor and Head, Department of Classics—1960.

Farrell, John Kevin Anthony; B.A., M.A. (Western Ontario), Ph.D. (Ottawa), F.R.S.A. Associate Professor of History—1962.

Faught, Rev. Donald Thomas, C.S.B.; B.A. (Toronto), M.A. (Michigan). Professor and Head, Department of Mathematics—1954.

Fehr, Rev. Robert Charles, C.S.B.; B.A. (Toronto), M.A. (Detroit), Ph.D. (Fordham). Professor and Head, Department of Psychology—1951.

Felver, William; B.A., M.A. (Cornell). Assistant Professor of Classics—1963.

Figuerola, Mrs. Christina G.; M.A. (Columbia), Ph.D. (Universidad Nacional, Havana, Cuba), Ph.D. (Masonic University of Cuba). Assistant Professor of Modern Languages —1965.

*Fletcher, Harold Ross; B.A.Sc., M.A.Sc. (Toronto). Associate Professor of Electrical Engineering—1958.

Flood, Patrick Francis; B.A., M.A. (Western Ontario). Associate Professor of Philosophy —1945.

Galasso, Pasquale J.; B.A., B.P.H.E. (Queen's), M.A. (Michigan). Associate Professor and Director of the School of Physical and Health Education—1965.

Gertz, John Blake; B.S. (Detroit), M.B.A. (Ohio State). Associate Professor of Business Administration—1957.

Gillen, William John; B.A. (Assumption), M.A. (Toronto). Assistant Professor of Economics—1959.

Gnyp, Alex William; B.A.Sc., M.A.Sc., Ph.D. (Toronto). Associate Professor of Chemical Engineering—1958.

Habib, Edwin Emile; B.Sc. (Birmingham), Ph.D. (McMaster). Associate Professor of Physics—1958.

Habowsky, J. E. J.; Diplom-Landwirt (B.S.A.) (Cobourg, Bavaria), M.S.A., Ph.D. (Toronto). Assistant Professor of Biology—1964.

Halford, Peter W.; B.A., M.A. (Windsor). Lecturer in Modern Languages—1966.

Halpern, Leopold E.; D.Phil. (Vienna). Associate Professor of Physics—1967.

Hartt, James Paul; B.A.Sc. (Toronto), O.L.S., M.S.C.E. (Wayne State). Associate Professor of Civil Engineering—1958.

Hedgecock, Nigel Edward; B.A., M.A. (British Columbia), Ph.D. (McMaster). Associate Professor of Physics—1961.

*Helling, Rudolf A.; B.A. (Wayne State), Dipl. Disc. Pol. (Wilhelmshaven-Goettingen), Ph.D. (Wayne State). Professor of Sociology and Head, Department of Sociology and Anthropology—1956.

*On leave.

Hermiston, Ray Talbot; B.A. (Queen's), M.S. (Michigan). Assistant Professor of Physical and Health Education—1966.

Hill, Rev. Henry Gordon, O.G.S.; B.A. (Queen's), B.A., M.A. (Cambridge), L.Th. (Trinity). Assistant Professor of History—1964.

Hilton, Susanne; B.A. (Western Ontario), M.S. (Oregon). Lecturer in Physical and Health Education—1966.

Hoffman, The Rev. John Charles; B.A. (Toronto), B.D., Ph.D., S.T.M. (McGill), Th.D. (Union Theol. Sem.); Principal of Iona College. Assistant Professor of Theology—1964.

Holland, William John; B.Sc. (Queen's), M.S., Ph.D. (Wayne State). Associate Professor of Chemistry—1960.

*Holmes, David M.; B.A. (Western Ontario), M.A. (Windsor). Lecturer in English—1964.

Holuj, Frank; B.Sc. (London, England), M.Sc., Ph.D. (McMaster). Associate Professor of Physics—1961.

Horn, Dieter; Ph.D. (Marburg). Assistant Professor of Modern Languages—1966.

Horne, Gilbert Richard; C.D., B.A. (Western Ontario), M.A., Ph.D. (Michigan); Dean of Business Administration. Professor of Business Administration—1931.

Hoskins, Ronald G.; B.A., M.A. (Windsor). Lecturer in History—1966.

Howell, Rev. Arthur Robert, C.S.B.; B.Sc. (Saskatchewan), S.T.B. (St. Michael's, Toronto), M.A.Sc. (Toronto). Assistant Professor of Mechanical Engineering—1958.

Huang, Roderick; B.A. (Fukien Christian, China), M.A. (Wesleyan), Ph.D. (Northwestern). Professor of English—1965.

Huschilt, Jacob John Michael; B.A.Sc., M.A.Sc. (Toronto). Lecturer in Electrical Engineering—1960.

Huschilt, John; B.A., M.A. (Toronto), Ph.D. (Wayne State). Associate Professor of Physics—1953.

Ingram, Ruth; B.Sc.N. (P.H.N., Alberta), M.N. (N.Ed., P.H.N., Washington), Reg. N. Assistant Professor of Nursing—1961.

Isajiw, Wsevolod W.; B.A. (LaSalle), M.A., Ph.D. (Catholic U. of America). Assistant Professor of Sociology—1965.

Johnson, Ralph Henry; B.A. (Xavier). Lecturer in Philosophy—1966.

Kelly, Daniel Patrick; B.A., M.A. (Toronto). Associate Professor of Drama—1958.

Kennedy, John B.; B.Sc.(Hons.) (Cardiff), Ph.D. (Toronto). Professor and Head, Department of Civil Engineering—1963.

Kennedy, Rev. Leonard Anthony, C.S.B.; B.A , M.A., Ph.D. (Toronto). Associate Professor of Philosophy—1963.

Kiessling, Rev. Jerry J., C.S.B.; B.Sc. (Fordham), M.A. (Rochester), S.T.B. (Toronto). Lecturer in Theology—1966.

King, Joseph Norman; B.A. (Toronto), S.T.B. (Laval), M.A. (Toronto). Assistant Professor of Theology—1964.

*On leave.

Kingston, Rev. Frederick Temple; B.A., M.A. (Toronto), L.Th., B.D. (Trinity), D.Phil. (Christ Church, Oxford); Principal, Canterbury College. Professor of Philosophy—1959.

Kingstone, Basil D.; B.A., M.A., Ph.D. (Oxford). Assistant Professor of Modern Languages—1963.

Kirby, Hugh Wride; B.A. (Sir George Williams), M.A. (Toronto), Ph.D. (London). Assistant Professor of Psychology—1964.

Klein, A. Owen Jr.; A.B., M.A. (Villanova). Assistant Professor of Drama and Speech—1966.

Kolinski, Ralph; B.S. (Marquette), M.A. (Wayne State). Lecturer in Economics—1966.

*Kosicki, Rev. George Watka, C.S.B.; B.A. (Western Ontario), M.S., Ph.D. (Michigan). Associate Professor of Chemistry—1956.

*Kovacs, Aranka Eve; B.A. (McMaster), M.A. (Toronto), Ph.D. (Bryn Mawr). Associate Professor of Economics—1961.

Krause, Lucjan; B.Sc. (London, England), M.A., Ph.D. (Toronto), F.Inst.P. Professor and Head, Department of Physics—1958.

Kushnick, Stephen A.; B.S., M.S., Ph.D. (Pittsburgh). Assistant Professor of Psychology—1965.

Kuspit, Donald Burton; B.A. (Columbia), M.A. (Yale), Ph.D. (Frankfort). Associate Professor of Philosophy—1966.

Laba, Jan Tadeusz; Dip. Ing. (London), M.A.Sc. (Windsor). Associate Professor of Civil Engineering—1961.

Laframboise, James Gerald; B.Sc. (Assumption); B.A.Sc., M.A., Ph.D. (Toronto). Assistant Professor of Mathematics—1965.

Lee, Margaret Naomi; P.H.Certif. (Brighton), B.Sc.N. (Assumption), M.A., Ed.D. (Columbia). Associate Professor of Nursing—1966.

LeMire, Eugene D.; Ph.B., M.A. (Detroit), Ph.D. (Wayne State). Associate Professor of English—1962.

Lewis, John Underwood; A.B. (North Texas State), Ph.D. (Marquette). Assistant Professor of Philosophy—1964.

Llanos, Teodoro A.; Ph.D. (Louvain). Assistant Professor of Modern Languages—1965.

London, Philip W.; A.B. (Queen's College), M.A., Ph.D. (Michigan). Assistant Professor of English—1965.

McCarthy, Lillian Margaret; B.A., M.A., Ph.D. (Toronto). Professor of Modern Languages—1958.

McCorquodale, John Alexander; B.E.Sc. (Western Ontario), M.Sc. (Glasgow). Lecturer in Civil Engineering—1966.

McCurdy, Howard Douglas; B.A. (Western Ontario), B.Sc. (Assumption), M.Sc., Ph.D. (Michigan State). Associate Professor of Biology—1959.

McGouey, Rev. Thomas, C.S.B.; B.A. (Western Ontario). Assistant Professor of Psychology—1949.

MacInnis, Cameron; B.Sc. (Dalhousie), B.E. (Hons.) (Nova Scotia Technical College), Ph.D. (Durham, U.K.). Associate Professor of Civil Engineering—1963.

*On leave.

McKenney, Donald J.; B.Sc., M.Sc. (Western Ontario), Ph.D. (Ottawa). Assistant Professor of Chemistry—1964.

McLean, Evelyn Grey; B.A. (Assumption), M.A. (Wayne State). Dean of Women, and Sessional Instructor in Fine Art—1963.

McMahon, George Arthur; B.A. (Assumption), M.A. (Queen's). Assistant to the Dean of Arts and Science, and Lecturer in History—1963.

McNamara, Eugene Joseph; B.A., M.A. (DePaul), Ph.D. (Northwestern). Associate Professor of English—1959.

McPherson, Barry David; B.A., M.A. (Western Ontario). Lecturer in Physical and Health Education—1966.

McVinnie, William W.; B.S.C.E., M.S.C.E., Ph.D. (Illinois). Lecturer in Civil Engineering—1964.

Maasland, Dirk E. L.; M.Sc., Ph.D. (Colorado). Assistant Professor of Civil Engineering —1964.

Malik, Om Parkash; B.Sc. (A.I.C.T.E.), M.E. (Roorkee), Ph.D. (London). Assistant Professor of Electrical Engineering—1966.

Malley, Rev. Eugene R., C.S.B.; B.A., M.A. (Toronto), S.T.L., S.T.D. (Angelicum). President of Assumption University. Associate Professor and Head, Department of Theology —1964.

Malone, Rev. John Alphonse, C.S.B.; B.A. (Western Ontario), M.A. (Toronto), Ph.D. (Fordham). Associate Professor of Psychology—1959.

Marie-du-Crucifix, Sister, S.N.J.M.; B.A. (Ottawa), M.A. (Laval), Ph.D. (Wisconsin). Assistant Professor of Modern Languages—1964.

Mathur, Gurucharan Prasad; B.S. (Bombay), M.S., Ph.D. (Northwestern). Assistant Professor of Chemical Engineering—1964.

Miner, Brother Bonaventure; B.A. (Toronto, London), M.A. (Toronto), Ph.D. (London). Associate Professor of History—1966.

Molloy, Mary Elizabeth; B.A., M.Sc.(N) (Western Ontario), Dip. P.H.N. (Toronto). Assistant Professor of Nursing—1963.

Monforton, Gerard R.; B.A.Sc. (Assumption), M.A.Sc. (Windsor). Lecturer in Civil Engineering—1962.

Montrose, Cameron Hayes; B.Sc. (Queen's). Instructor in Civil Engineering—1957.

Morey, Carl; A.R.C.T. (Royal Conservatory), Bac.Mus. (Toronto), M.M., Ph.D. (Indiana). Assistant Professor of Music—1964.

Moriarty, Richard James; B.A., M.A. (Assumption), M.Ed. (Wayne State). Assistant Professor of Physical and Health Education and Director of Athletics—1956.

Morrow, Harry M.; B.A., B.S.W., M.S.W. (British Columbia). Associate Professor and Head, Department of Social Work—1966.

Mouratides, Anastasio Isaac; B.Comm., M.A., Ph.D. (McGill). Assistant Professor of History—1964.

*Mulvihill, Rev. Daniel Joseph, C.S.B.; B.A. (Western Ontario), M.A., Ph.D. (Michigan). Professor and Head, Department of History—1942.

Murray, J. Alex; B.Comm. (Assumption), M.B.A. (McMaster), Ph.D. (Illinois). Assistant Professor of Business Administration—1966.

*On leave.

Nash, John Colin; B.A. (Western Ontario), M.S. (Illinois). Lecturer in Physical and Health Education—1966.

Nelson, Ralph Carl; B.A., M.A. (DePaul), Ph.D. (Notre Dame). Associate Professor of Political Science—1961.

Nicol, Allan; Applied Physics (Royal College of Science and Technology, Glasgow); Ph.D. (Edinburgh). Associate Professor of Mechanical Engineering—1963.

Nigh, Rev. William Francis, C.S.B.; B.A. (Western Ontario), M.A. (Houston). Associate Professor of Mathematics—1946.

North, Walter P. T.; B.Sc. (Queen's), M.Sc. (Saskatchewan), Ph.D. (Illinois). Associate Professor of Mechanical Engineering—1965.

O'Donnell, Kathleen M.; B.A. (McGill), M.A. (Western Ontario), Ph.D. (Montreal). Assistant Professor of English—1966.

O'Donoghue, Rev. John Michael Curtis, C.S.B.; B.A., M.A. (Toronto). Assistant Professor of Modern Languages—1959.

Ogata, Hisashi; B.S. (Tokyo College of Science), M.S. (Tokyo U. of Education), Ph.D. (Western Reserve). Assistant Professor of Physics—1965.

O'Meara, Rev. John Patrick, C.S.B.; B.A. (Toronto), M.A. (Wayne State), Ph.D. (Ottawa). Professor of History—1959.

Pappert, Edward Cecil, C.S.B.; B.A. (Toronto), M.A. (Detroit), Ph.D. (Ottawa). Director of Extension. Assistant Professor of English—1950.

Parr, James Gordon; B.Sc. (Leeds), Ph.D. (Liverpool). Dean of Applied Science and Professor of Engineering Materials—1964.

Pauline of Mary, Sister, S.N.J.M.; B.A. (Western Ontario), M.A. (Laval). Assistant Professor of Modern Languages—1950.

Pazik, Rev. Ronald Stanley, C.S.B.; B.A. (Western Ontario), M.A. (Toronto). Assistant Professor of Modern Languages—1955.

Perez-Soler, Vincente; Ph.D. (Valencia). Assistant Professor of Modern Languages—1966.

Petras, Michael Luke; B.Sc. (Assumption), M.Sc. (Notre Dame), Ph.D. (Michigan). Associate Professor of Biology—1956.

Pflanzner, Allan F.; B.A.Sc. (Assumption). Lecturer in Electrical Engineering—1961.

Philip, Brother Roger, F.S.C. (William James Overend); B.A., M.A. (Toronto), Ph.D. (Catholic U. of America). Professor Emeritus, Department of Psychology—1956.

Phillips, William Gregory; B.A., M.A., Ph.D. (Toronto). Associate Dean of Arts and Science; Professor of Economics and Head, Department of Economics—1950.

Pillay, Dathathry T. N.; B.Sc. Ag. (Osmania, India), M.S., Ph.D. (Cornell). Assistant Professor of Biology—1963.

Pinto, Robert Charles; B.A., M.A. (Toronto). Assistant Professor of Philosophy—1963.

Plante, Homer Frederick; B.A. (Western Ontario), M.A. (Toronto). Assistant Professor of English—1956.

Price, Stanley James Whitworth; B.A., M.Sc. (British Columbia), Ph.D. (Edinburgh). Associate Professor of Chemistry—1959.

Pryke, Kenneth G.; B.A. (Carleton), M.A., Ph.D. (Duke). Associate Professor of History —1963.

Querbach, Carl W.; B.A., B.D., S.T.M. (Concordia), M.A. (Michigan). Assistant Professor of Classics—1966.

Querbach, Mrs. Carlyn A.; A.B. (Mount Holyoke), M.A. (Michigan). Lecturer in Classics —1966.

Qureshi, Abdul H.; M.E. (Peshawar), Ph.D. (Techn. U., Aachen). Assistant Professor of Electrical Engineering—1966.

Ransome, Jack C.; A.B., M.A. (Toledo); M.A., Ph.D. (Harvard). Professor and Head, Department of Geography—1966.

Raouf, Abdul; M.I.E. (Toledo). Assistant Professor of Mechanical Engineering—1966.

Record, Rev. Maurice Adrian, C.S.B.; B.A. (Western Ontario), M.A. (Toronto). Associate Professor of Psychology—1952.

Richardson, Donald Haig; B.A., M.A. (Western Ontario). Assistant Professor of Psychology—1965.

Roach, Florence Martina; R.R.C., Reg.N., B.Sc. (Seton Hall), R.R.L. Associate Professor and Director, School of Nursing—1955.

Robinson, David; M.Sc. (Belfast), Ph.D. (Western). Associate Professor of Physics—1964.

Romana, Sr. Mary, S.N.J.M.; B.Sc. (Nazareth College), M.S. (Michigan State). Assistant Professor of Home Economics—1959.

Romanow, Walter I.; B.A., M.A. (Windsor). Director of Communication Services and Lecturer in English—1965.

Rosenauer, Nicholas; M.Eng. (Technical U. of Emperor Alexander I), D.Ing. (Latvia). Visiting Professor of Mechanical Engineering—1963.

Rothberger, Fritz; Ph.D. (Vienna). Professor of Mathematics—1966.

Rourke, Byron Patrick; B.A.(Hons.) (Windsor), M.A., Ph.D. (Fordham). Assistant Professor of Psychology—1965.

Rumfeldt, Robert Clark; B.Sc.(Hons.) (Loyola, Montreal), Ph.D. (Alberta). Assistant Professor of Chemistry—1965.

Ruth, Rev. Norbert Joseph, C.S.B.; B.A., M.A. (Toronto); Dean of Arts and Science. Special Lecturer in Philosophy of Science—1951.

Rutherford, Kenneth Gerald; B.A. (Western Ontario), Ph.D. (Wayne State). Professor and Head, Department of Chemistry—1958.

St. Pierre, Carl Clifford; B.A.Sc. (Assumption), M.A.Sc., Ph.D. (Northwestern). Assistant Professor of Chemical Engineering—1964.

Sabina, Leslie Robert; A.B. (Cornell), M.S., Ph.D. (Nebraska). Associate Professor of Biology—1966.

Sanders, Leta Grace, Reg. N.; Cert. in Teaching and Supervision (Western Ontario), B.S., M.A. (Columbia). Assistant Professor of Nursing—1960.

Sanderson, Marie Elizabeth (Mrs. R. M.); B.A. (Toronto), M.A. (Maryland), Ph.D. (Michigan). Assistant Professor of Geography—1965.

Schwegel, Douglas M.; B.A. (Lake Forest), M.A. (George Washington), Ph.D. (Minnesota). Assistant Professor of English—1964.

Sheridan, Edward Patrick; B.A. (Windsor), M.A. (Detroit), Ph.D. (Loyola). Assistant Professor of Psychology—1966.

Singh, Sankatha Prasad; M.Sc., Ph.D. (Banaras). Assistant Professor of Mathematics—1965.

Skakoon, Walter Sylvester; B.A. (Western Ontario), M.A. (Toronto). Assistant Professor of Modern Languages—1962.

Smedick, Lois Katherine; B.A. (Wilson), Ph.D. (Bryn Mawr). Assistant Professor of English—1963.

Smith, Alexander Cormac; B.Sc., M.Sc., Ph.D. (Dublin). Associate Professor of Mathematics—1963.

Smith, Alfred Arthur; B.A., M.A. (Queen's), Ph.D. (McGill). Professor of Psychology—1959.

Smith, Mrs. J. C.; B.A. (Syracuse), M.A. (Wisconsin). Associate Professor of English—1967.

Smith, Raymond J.; B.A., M.A., Ph.D. (Wisconsin). Associate Professor and Acting Head, Department of English—1964.

Sonnenfeld, Peter; Matura (Berlin), Absolut. Rerum Nat. (Bratislava), D. Rerum Nat. (Prague). Associate Professor of Geology—1966.

Speigel, Morley; B.A. (Manitoba), M.A. (Western Ontario). Assistant Professor of English—1965.

Spellman, John W.; B.A. (Northeastern), Ph.D. (London). Professor and Head, Department of Asian Studies—1967.

Sridhar, Krishnaswamy; B.Sc. (Madras U.), D.M.I.T. (Madras Inst. of Technology), M.A.Sc., Ph.D. (Toronto). Associate Professor of Mechanical Engineering—1963.

Stager, Robert A.; B.Sc., M.Sc. (Toronto), Ph.D. (Illinois). Associate Professor of Chemical Engineering—1963.

Starr, Meyer W.; B.A. (Toronto), M.A. (Princeton). Assistant Professor of Psychology—1961.

Stewart, Donald R.; B.A., M.A. (Wayne State). Lecturer in Sociology and Anthropology—1966.

Stokes, Rev. Thomas J., C.S.B.; B.A., M.A., Ph.D. (Toronto). Assistant Professor of Philosophy—1966.

Stolar, Robert W.; B.Comm. (Toronto), M.B.A. (McMaster), C.A. Assistant Professor of Business Administration—1966.

Strick, John Charles; B.A. (Manitoba), M.A. (Assumption), Ph.D. (Alberta). Assistant Professor of Economics—1965.

*Sullivan, John Francis; B.S., M.A. (Detroit), Ph.D. (Michigan). Professor of English—1958.

Szamosi, Geza; Ph.D., D.Sc. (Budapest). Professor of Physics—1964.

Taylor, Rev. C. Maurice, C.S.B.; B.A. (Toronto), S.T.B. (U. of St. Michael's College), M.A. (Middlebury College, Mainz). Lecturer in Modern Languages—1966.

Thibault, Albert A.; A.B. (Boston College), L.es L. (Paris), M.A. (Harvard), D.es L. (Laval). Associate Professor of Modern Languages—1953.

Thibert, Roger Joseph; B.A. (Western Ontario), M.S. (Detroit), Ph.D. (Wayne State). Associate Dean of Arts and Science; Professor of Chemistry—1953.

Thomas, Paul Alexander Vivian; B.Sc.Eng. (London), Ph.D. (Glasgow). Professor and Head, Department of Electrical Engineering—1962.

*On leave.

Tracy, Derrick Shannon; B.Sc., M.Sc. (Lucknow), Sc.D. (Michigan). Associate Professor of Mathematics—1965.

Tucker, Henry Joseph; B.Eng., M.Eng. (McGill). Associate Professor of Mechanical Engineering—1960.

Vandall, Paul Ernest; B.A., M.A. (Western Ontario). Assistant Professor of Geography —1952.

van Wijngaarden, Arie; B.Sc., Ph.D. (McMaster). Associate Professor of Physics—1961.

Venkatesulu, Gadi V.; B.E. (Mysore), M.S.E.E. (Lehigh). Assistant Professor of Electrical Engineering—1961.

Vincent, Rev. Claude L., C.S.B.; B.A. (Toronto), M.A. (Loyola). Lecturer in Sociology and Anthropology—1966.

Vuckovic, Milorad Nicolas; B.A., M.A. (Assumption), Ph.D. (McGill). Associate Professor of History—1960.

Wagenberg, Ronald H.; B.A., M.A. (Assumption), Ph.D. (London). Assistant Professor of Political Science—1964.

Walker, Franklin A.; B.A., M.A. (Toronto), Ph.D. (Cornell). Professor of History—1966.

Walker, Sue Sheridan (Mrs. F. A.); B.S., M.A. (Loyola), Ph.D. (Chicago). Assistant Professor of History—1966.

Warner, Alden Howard; B.A. (Maine), M.A., Ph.D. (Southern Illinois). Assistant Professor of Biology—1965.

Watson, Edward A.; B.A. (Howard), M.A. (Chicago). Assistant Professor of English—1966.

Weiler, Rev. Arthur Jerome, C.S.B.; B.A. (Toronto). Lecturer in Modern Languages and Geology—1937.

White, Walter LeRoy, D.F.C.; B.A. (Western Ontario), M.A. (Toronto), Ph.D. (Michigan). Associate Professor and Head, Department of Political Science—1956.

Wilkinson, Rev. Peter Frederick; B.A., M.A. (Toronto), L.Th. (Wycliffe). Assistant Professor of Philosophy—1962.

Winner, John Michael; B.S., M.S. (Notre Dame). Assistant Professor of Biology—1963.

Wood, Gordon Walter; B.Sc., M.Sc. (Mount Allison), Ph.D. (Syracuse). Assistant Professor of Chemistry—1963.

Worden, Orian; B.S., M.S. (Illinois), Ph.D. (Wayne State). Associate Professor of Psychology—1966.

Yerex, Elton J.; B.F.A. (Manitoba), M.F.A. (Michigan). Lecturer in Fine Art—1965.

Youdelis, William V.; B.Sc. (Alberta), M.Eng., Ph.D. (McGill). Associate Professor of Engineering Materials—1965.

Zakon, Mrs. Batia; M.A. (University of Wilno). Assistant Professor of Modern Languages —1958.

Zakon, Elias; Mgr. Phil., Dr. jur. (Stefan Batory U., Wilno). Professor of Mathematics—1957.

Zin, Michael; B.Comm. (Assumption), M.B.A. (Michigan), Ph.D. (Michigan State). Professor of Business Administration—1956.

Zischka, Kurt Anton; M.A. (Frankfort), D.Sc. (Darmstadt). Associate Professor of Mathematics—1966.

SESSIONAL AND PART TIME APPOINTMENTS

Barat, Arthur M.; LL.B. (Western Ontario). Sessional Instructor in Business Administration—1966.

Berbynuk, Stella; B.Comm. (Assumption), M.B.A. (Wharton). Sessional Instructor in Business Administration—1966.

Blake, Rev. Victor Kenneth; B.A., L.Th., B.D. (Toronto). Sessional Instructor in Theology —1966.

Closs, Michael Paul; B.Sc., M.Sc. (Windsor). Sessional Instructor in Mathematics—1966.

Coughlin, Claire; B.A. (Toronto). Sessional Instructor in Classics—1966.

Dydyk, Robert Barry; B.A.Sc., M.A.Sc. (Windsor). Sessional Instructor in Electrical Engineering—1966.

Fazio, Paul; B.A.Sc., M.A.Sc. (Windsor). Sessional Instructor in Civil Engineering—1966.

Fleming, K. Maxwell; B.Sc. (McGill), C.A. (Ont.). Sessional Instructor in Business Administration—1965.

Flynn, Robert James; M.Sc. (Windsor). Sessional Instructor in Mathematics—1966.

Gmeiner, Eugen Friedrich; B.Mus. (Vienna State Academy). Sessional Instructor in Music—1966.

Habermas, Robert A.; B.S., M.B.A. (Wayne State). Sessional Instructor in Business Administration—1966.

Kassimatis, Constantine; M.A. (Toronto), Ph.D. (Queen's). Sessional Instructor in Mathematics—1963.

McEachern, Vernon Ewart; B.A. (Alberta), B.Div. (Union College, B.C.), Th.M., Th.D. (Emmanuel). Assistant Professor of Theology—1965.

MacLean, Charles Alexander; B.Comm. (Assumption), M.B.A., C.P.A. (Michigan). Sessional Instructor in Business Administration—1966.

Meanwell, Robert Walter; B.A. (Western Ontario), F.C.A. (Ontario). Sessional Instructor in Business Administration—1954.

Murphy, Raymond J.; B.S., LL.D., J.S.D. (St. John's), M.A. (Columbia), Ed.M. (Harvard), M.B.A. (Michigan). Sessional Instructor in Business Administration—1966.

Ortiz, Armando; B.Sc., M.D. (National U. of Mexico). Sessional Instructor in Psychology —1961.

Plaus, Francis Xavier; M.A. (Windsor). Sessional Instructor in Psychology—1966.

Rinehart, James W.; B.A., M.A. (Michigan State), Ph.D. (Ohio State). Sessional Instructor in Sociology and Anthropology—1966.

Schnitzer, Franz Karl; Ph.D. (Graz). Sessional Instructor in Mathematics—1962.

Stager, Mrs. Joan; B.S. (Illinois State), M.S. (U. of Illinois). Sessional Lecturer in Home Economics—1966.

Stollman, Samuel S.; B.Sc. (Columbia), M.A., Ph.D. (Wayne State). Assistant Professor of English—1966.

Swaisgood, Dale; B.A. (Bowling Green), M.S.W. (McGill). Consulting Social Worker—1966.

Teodoro, Donato T.; M.A. (Detroit). Sessional Instructor in Mathematics—1966.

Wallin, Robert; B.A. (Michigan). Sessional Instructor in Classics—1966.

Weingarden, Arthur Burton; B.A. (Assumption), Barrister-at-Law (Osgoode). Sessional Instructor in Business Administration—1960.

Wilson, David A.; B.Comm. (Assumption), M.B.A. (Michigan), C.A. Sessional Instructor in Business Administration—1966.

Winner, Mrs. Gillian; B.Sc. (Wales). Sessional Instructor in Biology—1965.

Yaworsky, Walter; M.D. (Queen's). Consultant Psychiatrist—1966.

HISTORY OF THE UNIVERSITY OF WINDSOR

On July 1, 1963, the new, non-denominational University of Windsor inherited an educational complex founded in 1857 as Assumption College, developed since 1870 by the Basilian Fathers (the Congregation of St. Basil), and expanded to Assumption University in 1953. The transition from an historic Roman Catholic university to a non-denominational institution was unprecedented.

The new institution included Assumption University as a federated member, operating residences on campus for men and women and holding in abeyance its degree-granting powers except in the graduate Faculty of Theology. All of the facilities and teaching faculty of Assumption University were absorbed in the University of Windsor, as were those of its federated, non-denominational Essex College, which ceased to exist.

Heritage

Assumption College opened its doors on February 10, 1857, largely through the efforts of Rev. Pierre Point, S.J., pastor of Assumption Parish in Sandwich, established as a mission in 1748 and made a parish in 1767, the oldest in Canada west of Montreal. M. Theodule Girardot was the first instructor. The College was incorporated by an Act of the Legislature of the Province of Canada which received Royal Assent August 16, 1858, during the Superiorship of Rev. Joseph Malbos, a Basilian who guided it for one year. Successively, the College was directed by Jesuits, Benedictines and secular clergy until the Basilians returned in 1870.

During the early years, the curriculum consisted of classical and commercial courses providing a complete high school and Arts course, primarily designed to prepare students for theological seminaries, although many alumni entered business and professional spheres. In 1919, Assumption affiliated with Western University, London, Ontario (now the University of Western Ontario), as an integral part of the latter's Faculty of Arts and Science with a broadened curriculum including General and Honours Courses in Arts and Science leading to Bachelor of Arts and Bachelor of Science degrees, graduate work in Philosophy leading to the Master of Arts degree, and pre-professional programs such as pre-engineering, pre-medicine and pre-law.

From 1934 to 1962, Holy Names College, conducted by the Sisters of the Holy Names of Jesus and Mary, enabled Assumption to become co-educational. Then the Sisters disbanded the College, while continuing to teach at the University, and Assumption took over its women's residence which was re-named Electa Hall.

University Development

On July 1, 1953, Assumption ended its affiliation with the University of Western Ontario and obtained its own university powers through an Act of the Ontario Legislature. In 1954 it was admitted to full membership in the National Conference of Canadian Universities and Colleges, to the University Matriculation Board of Ontario, and to the Association of Universities of the British Commonwealth.

In 1956, the College became Assumption University by an Act of the Ontario Legislature, and accepted as an affiliate the non-denominational Essex College, incorporated in 1954, which assumed responsibility for the Faculty of Applied Science, the Schools of Business Administration and Nursing, and the Departments of Biology, Chemistry, Geology and Geography, Mathematics, and Physics. Holy Redeemer College, national seminary of the Redemptorist Fathers, located three miles off campus, also affiliated. In 1957, Canterbury College, offering courses in Philosophy, Religious Knowledge and Medieval History, became the first Anglican college in the world to affiliate with a Roman Catholic university.

Recent Expansion

The University of Windsor was incorporated by the Ontario Legislature on December 19, 1962, accepting Assumption University in federation. During 1963 and 1964, affiliation agreements were made with Holy Redeemer College, Canterbury College and the new Iona College (United Church of Canada), the latter two planning to sponsor student residences and chaplains. A notable innovation in 1963-64 was the establishment of an inter-denominational, undergraduate Department of Theology, now offering courses in three theologies (Anglican, Roman Catholic and United Church), but available to others as the need arises.

The University of Windsor assumed control of the campus on July 1, 1963, and became a member of the International Association of Universities in June, 1964. Rev. E. C. LeBel, C.S.B., first President and Vice-Chancellor of the University of Windsor, was succeeded on July 1, 1964, by Dr. J. F. Leddy, who had been Vice-President (Academic) of the University of Saskatchewan.

A general expansion of the Faculty of Graduate Studies was accelerated in the academic year, 1964-65. The School of Business Administration became the Faculty of Business Administration in 1965.

A new language laboratory is the largest of its kind in Canada. A new School of Physical and Health Education offers B.P.H.E. and B.P.E. programs. Experimental closed-circuit TV lectures were started, and a new Biology Building was opened in 1966.

A department of social work was established in 1966; the division of geography became a department; the department of economics and political science was divided to form two independent departments.

Also, a new athletic field with an "all-weather" track was constructed; a new south wing of Windsor Hall, to accommodate the psychology department and other branches of the humanities and social sciences, as well as a new, ten-storey men's residence were started, for completion in 1967.

Presidents: 1963-64: Rev. Eugene Carlisle LeBel, C.S.B., C.D., LL.D.
1964- : John Francis Leddy, D.Phil., D.Litt., D.es L., LL.D., D.C.L.

GENERAL INFORMATION

I. RESIDENCE ACCOMMODATION

Traditionally, about half the student population of the University is from out of town and represents not only the various regional areas of Canada but many overseas countries as well as a large number who come to us from the United States. The spiritual and cultural values derived from such a cosmopolitan environment are important by-products of education. A residence hall contributes to a student's development in personal and social growth. Scholastic endeavour particularly is emphasized in the University's residence units.

All new students in their first year of study are expected to live in a residence provided by the University or by one of its federated or affiliated colleges, so far as facilities permit, unless they are living at home or with close relatives. Information and application forms for all residences are available through the Office of Student Affairs (Residence Housing).

After the application for residence has been received, the applicant will receive additional information concerning residence hall policies and will be notified of his or her assignment status. A deposit of $25.00 must accompany the application.

Permission to live off campus should be obtained from the Dean of Men or the Dean of Women where students are not living at home or with relatives. No women students under the age of twenty-one will be allowed to live off campus without first submitting written parental permission to the Dean of Women. Lists of off-campus lodgings are published under the direction of the Office of Student Affairs. (See also "Fees", p. A-34).

The University of Windsor has just completed the construction of a modern attractive residence tower to house 350 male students. Further units are planned in the near future for men and women.

The University also provides the food facilities for all resident students at the University.

For information write to: The Office of Student Affairs (Residence Housing), University of Windsor, Windsor, Ontario.

Assumption University operates Cody Hall and St. Michael's Hall for men with a total capacity of 350, and Electa Hall for women with accommodation for 245.

For information write to: The Office of Student Affairs (Residence Housing), University of Windsor, Windsor, Ontario.

Canterbury College operates an apartment house for married students. Enquiries may be sent directly to the College.

II. CAMPUS LIFE

Life on the University of Windsor campus can be a rewarding experience for those students who make use of the opportunities offered. A formal academic program is well enhanced by a co-curricular program intended to broaden the moral, social and physical capabilities of the students. Through this co-operative effort, the students are given an opportunity to derive maximum benefit from and to contribute to the university community.

The main responsibility for this falls to the Office of Student Affairs, which is charged with the general supervision of all extra-curricular affairs and activities of the students, including counselling, social and cultural activities, conduct, discipline, placement and housing. Student Affairs personnel work in co-operation with student organizations in an attempt to establish an ideal community governed by high yet reasonable codes of conduct and dedicated to the development of the students as enlightened, responsible citizens.

University Library

The present University Library was completed in 1958. Modular in plan, it is 90 feet wide, 190 feet long, and four stories high. It provides shelving for 350,000 volumes and has a seating capacity of five hundred. The open stack arrangement follows the modern practice of placing readers among books.

Special library facilities for faculty and students include study carrells in the stack area, browsing and display areas, seminar rooms, faculty studies. A combined audio-visual and lecture room on the third floor provides all necessary audio-visual equipment and seating for 200 persons. Here the Library Science lectures are given and other lectures when 16 mm. films, filmstrips, pictures or book displays are required.

The Library is intended for purposes of reading and serious study; quiet must be observed at all times. Since smoking space has been provided, smoking is not allowed in the reading and reference rooms, seminar rooms or stairways. Failure to maintain a suitable standard of conduct in the Library, or failure to observe any of the Library regulations may lead to cancellation of Library privileges.

Student Government

Student organizations and activities are a vital part of life at the University of Windsor. The initiative in these organizations and the direction of their activities are in the hands of the students and are regulated in the main through their student government of which all undergraduate students are members. The students' administrative council works with all other organizations to maintain a co-operative, orderly, constructive college community life. Faculty advice and assistance is readily available to all student organizations.

University Centre

Campus life outside the lecture hall and laboratory is creative as well as entertaining. The University Centre provides well-appointed facilities including small group meeting rooms, a formal lounge, record booths, a music and magazine lounge, student council and press offices, and both resident and day students' snack areas and cafeteria. In the Centre, there is the University Store, an Arts and Crafts Centre and a central walk-through gallery which provides year-round visual enjoyment with a series of exhibitions of the plastic arts. The second floor auditorium, with a view of the Ambassador Bridge to Detroit, Michigan, accommodates banquets, dances and musical events. The Centre offers faculty and alumni facilities for dining, meetings, social, and cultural activities. There is also a private dining room for the faculty.

Clubs

Most club and interest group activities have the University Centre as their headquarters. Such matters as radio broadcasting, model Parliaments, skiing, flying and ethnic interests, find their organizational base here. Campus organizations provide social, political, religious, cultural and recreational opportunities and experiences. For students having special abilities and interests, there are departmental clubs, national and local organizations, and intercollegiate teams. All the organizations welcome any interested student.

The Graduate Student Society

The Graduate Student Society which came into being on January 30, 1964, is designed to bring together for educational and social activities graduate students from the various faculties and affiliated Colleges of the University. It aims at making the Graduate students aware of the full range of academic, cultural, and social opportunities available throughout the University.

The Society sponsors lectures by specialists in varied fields of graduate interest, with the intention of promoting interdisciplinary awareness and understanding.

Special Events

The Christian Culture Series, conducted by the federated Assumption University, brings to the campus outstanding lecturers and artists.

Another unique feature is the annual Canadian-American Relations Seminar, which brings together outstanding personages from university, business and government from both Canada and the United States to discuss matters of mutual concern to both countries.

Publications

Students interested in journalism can find expression in the weekly newspaper, the *Lance*, the yearbook, the *Ambassador*, and the literary magazine, *Generation*.

Athletics

Realizing the value of a balanced regimen of exercise and play as part of the total education process, the University fosters an athletic program which is both recreational and competitive. Approximately eighty per cent of the students participate in extensive intramural programs for both men and women involving some eighteen sports. While under the supervision of the Director of Athletics, these programs are operated by the students who participate. For those who excel athletically there is opportunity for competition within the Ontario-Quebec Athletic Association.

III. STUDENT SERVICES

Counselling

To help the students achieve greater personal growth, make intelligent career choices, find rewarding jobs, and enjoy the challenge of learning and the consequent satisfaction of success, the University provides for them counselling services commensurate with their needs, whether educational, vocational, social, moral or religious.

Personal

Students are invited to consult, in the case of men students, the Dean of Men and, in the case of women students, the Dean of Women for assistance in personal matters and for counsel relating directly to the University community.

Financial

The staff of the Awards Office is available for consultation regarding financial assistance. Information concerning awards, student loan funds, the Canada Student Loan and all types of financial aid may be obtained from the Awards Office.

Academic

At registration each student is assigned as his counsellor a faculty member who will give advice on academic matters and to whom he reports for periodic counselling.

Religious

Although non-sectarian in its support of campus religious life, the University is keenly aware of the importance of ethical and moral influences in the development of the individual. Students of all faiths appreciate this dedication to wholesome principles and have access to the spiritual and personal counselling services of chaplains representing the various religious denominations.

Guidance Bureau

The Department of Psychology offers technical assistance in personal and vocational guidance. There is a professional staff with licensed psychologists, psychiatrist and sociologist.

Placement

Job-seekers, whether they need summer work, part-time work during the academic year, or permanent employment upon graduation, are assisted by the campus Placement Officer, who is appointed by the Canada Manpower Centre. During the year conferences with prospective employers from business, industry and education are arranged for seniors who are registered with the Placement Office. The University recognizes that some students must supplement their income by part-time employment during the academic year; it wishes to point out, however, that unless such employment is kept to a minimum, both the student's health and academic standing may suffer. In any case, students who must work long hours do not derive full benefit from their university experience and may be required to take a reduced program of studies. A student in such circumstances would be better advised to obtain a loan, or alternatively to postpone his university education until such time as he can afford to devote his full time to the many facets of university life.

Health and Insurance

Medical Office — The University has a medical office, with a physician and nurse, to advise and counsel students who are in need of care, therapy or hospitalization. A number of first-aid stations, for the treatment of minor injuries, are distributed throughout the University buildings.

Accident Insurance — All full time day students are covered by a blanket accident insurance policy administered by the University. This covers students for actual expenses incurred as a result of an accident.

Health and Hospitalization — Students are urged to enrol in the group medical and hospitalization plan available through the Office of Student Affairs. Students are required to submit a certificate of medical examination performed by their family physician as part of the routine admissions procedure. Those students participating in athletics must also submit annual medical certificates. The University does not assume responsibility for expenses incurred as a result of injuries sustained by students on campus. Further information about the University's accident insurance plan, health insurance and hospitalization plans may be obtained from the Office of Student Affairs.

International Students — International students are covered under the Accident Insurance and Accidental Death and Dismemberment Policies as described above and are also strongly urged to enrol in a health and hospitalization plan such as OMSIP or Ontario Hospital Services Commission.

Military Training

The Canadian Army, Navy and Air Force have several programs for students on campus; information regarding these programs can be obtained at the time of registration.

International Students

The University provides an international student program in co-operation with the Student Council and the International Student Organization which is beneficial and educational in cross-cultural experiences. Each year, almost 300 international students are enrolled from some 30 countries.

FEES

Fees are subject to change without notice. All fees are for the academic year, except where otherwise indicated.

FULL TIME (UNDERGRADUATE)

Any undergraduate student taking four courses or more will be charged the fee for full time attendance. The following schedule lists the minimum amounts payable, including registration, tuition, library, laboratory, examination, graduation, university centre, health service, insurance, and student government and activities fees.

Preliminary Year	$575.00*
Arts, Science, Commerce, Nursing, Physical Education (other years)	525.00*
Engineering (including Engineering Association Fee)	614.00*

*This includes $17.50 for student government and activities.

FULL TIME (POSTGRADUATE)

Tuition	$430.00
Incidentals (payable at registration)	40.00
(Including: Graduate Student Society, $5; University Centre, $12.50 Registration, Library, Laboratory, Examinations, $22.50).	
Total fees for one-year program	$470.00

Athletic fee . . . to be arranged, dependent on participation.

If the student admitted to the one-year program should take longer than one calendar year to complete his program, his fees will be $430, plus $40 incidental fees each year until he completes the requirements for the degree.

PART TIME DAY

Tuition, per hour of instruction a week (or equivalent)*	$47.50
Science laboratory fee, per subject	30.00
Language laboratory fee, per subject	10.00
Psychology laboratory fee, per subject	10.00

*For postgraduate students, in no case will the minimum total fee per one-year program be less than the $470 listed under "Full Time". (Research and thesis are evaluated in terms of course equivalents).

EXTENSION AND SUMMER SCHOOL

See Division of Extension calendar.

MISCELLANEOUS FEES

Payable by all students as incurred.

Late Registration: Full-time	20.00
Part-time	5.00
Graduation "in absentia"	10.00
Civil Engineering Camp C.E. 401	50.00
Graduate Record Examination	12.50
Special and supplemental examination, per subject:	
Regular time and place	10.00
Outside regular time and/or place	20.00
Change of course	2.00
Transcript of record (Official)	1.00
(Unofficial)	.50
Evaluation of documents	10.00

NON-RESIDENT FEE

(Applies to all foreign students except those whose parents have taken up permanent residence in Canada. Needy students from overseas developing countries may request that this fee be waived; such requests should be addressed to the President of the University, in writing.)

$20 per subject to a maximum of	$100.00

PAYMENT OF FEES

As a convenience, students may pay their fees at any time in advance of registration day. Fees are due and payable on the day of registration; they may, however, be paid in two instalments (except overseas students who must pay in one payment) in which case a carrying charge of $5.00 is made. The first instalment is due at the time of registration; the second instalment is due on or before January 17, 1968. A penalty of **$10.00** will be assessed students paying the second instalment after January 17, 1968.

Failure to pay this outstanding account will bar a student from writing examinations or obtaining credits for previous work.

A reduction is made in the tuition fees of brothers and sisters attending the University simultaneously as full-time students.

WITHDRAWAL AND REFUND POLICY

Students who are forced to withdraw from a course or from the University, are required to notify the Registrar in writing and to give their reasons for withdrawal. The obligation of teaching and accommodating a student rests on the University on a yearly basis. Hence:

(1) **All tuition credits or refunds shall be made entirely at the discretion of the university.**

(2) Credits or refunds will be made in the following cases only: (a) Cash refunds may be granted in cases where students are compelled to withdraw on account of serious and continued personal illness. (b) Cash refunds may also be granted in cases where the student is compelled to withdraw for other personal reasons provided these are satisfactory to the University authorities.

(3) The portion of the fee refunded is determined by the date application for refund is received in the Registrar's Office—NOT THE DATE OF WITHDRAWAL. If the application is made during the first week of the semester, a refund of 90% of the semester fees will be returned; during the second week, 80%; during the third week, 60%; during the fourth week, 40%. After the fourth week of each semester no refund will be given. Cheques for refunds will be available only six weeks after withdrawal.

RESIDENCE FEES

Room and Board, per academic year: $850 - 900.

An extra charge of $15 is made if the residence fee is paid in two instalments.

Each student who wishes to live on campus must send to the Office of Student Affairs (Residence Housing) prior to September 1st a deposit of $25, which will be used as a caution fee. A deposit will be refunded if the reservation is cancelled prior to September 1st.

The Residence Council has a right to place a levy against the caution fee for the social and miscellaneous needs of the residences.

A student who withdraws from residence during the academic year may receive a refund only when such withdrawal is occasioned by circumstances beyond the control of the student and has the prior approval of the Director of Residence.

SUMMARY OF REGISTRATION, 1966-67

Regular Winter Session	**Men**	**Women**	**Total**
Arts	839	618	1457
Science	328	35	363
Nursing	6	196	202
Physical Education	56	32	88
Engineering	290	4	294
Commerce	262	7	269
Graduate Studies	196	27	223
Full Time Day (total)	1977	919	2896
Part Time Day	103	41	144
Evening Classes	768	517	1285
Summer Session 1966	559	395	954
	3407	1872	5279

PART TWO

UNDERGRADUATE FACULTIES

Biology Building, Windsor Hall in background

ACADEMIC INFORMATION

I. FACULTIES, DEGREES, AND DIPLOMAS

The academic work of the University is divided among four Faculties, each under the supervision of a Dean. The School of Nursing and School of Physical and Health Education are included in the Faculty of Arts and Science. The Faculties, courses, and degrees are as follows:

(a) **Faculty of Arts and Science:**

Bachelor of Arts (B.A.)
- General course in Arts leading to the B.A. degree.
- Honours courses in Arts leading to the B.A. degree.
- Diploma in Social Work.

Bachelor of Fine Arts (B.F.A.)
- Honours course leading to the B.F.A. degree.

Bachelor of Music (B.Mus.)
- Honours courses leading to the B.Mus. degree.

Bachelor of Science (B.Sc.)
- General course in Science leading to the B.Sc. degree.
- Honours courses in Science leading to the B.Sc. degree.

Certificate in Public Administration (by Extension only).

Certificate in Theology (by Extension only).

School of Nursing
- Bachelor of Science in Nursing Degree (B.Sc.N.)
- Diploma course in Nursing Education.
- Diploma course in Public Health Nursing.
- Diploma course in Nursing Service Administration.

School of Physical and Health Education
- Bachelor of Physical Education (B.P.E.);
- Bachelor of Physical and Health Education (B.P.H.E.).

(b) **Faculty of Applied Science:**

Bachelor of Applied Science (B.A.Sc.)
- Honours courses in Chemical, Civil, Electrical, and Mechanical Engineering and Engineering Materials, leading to the B.A.Sc. degree.

(c) **Faculty of Business Administration**

Bachelor of Commerce (B.Comm.)
- Honours courses in Business Administration leading to the B.Comm. degree.

Certificate in Business Administration (by Extension only).

(d) **Faculty of Graduate Studies:**

Master of Arts (M.A.);
Master of Science (M.Sc.);
Master of Applied Science (M.A.Sc.);
Master of Business Administration (M.B.A.);
Doctor's Degree (Ph.D.).

In the face of the twentieth-century explosion of knowledge, it has become increasingly important for students to extend their knowledge beyond the Bachelor degree. Indeed undergraduate education is now regarded by many students as the mere stepping-stone to the full development of their scholarly and professional capacities.

All graduate-level courses are offered through the Faculty of Graduate Studies. At present, programs leading to the Master's degree are offered in: creative writing, economics, English, geography, history, mathematics, philosophy, political science, psychology, romance languages, sociology, theology, biology, chemistry, mathematics, physics, business administration; in chemical, civil, electrical and mechanical engineering, and engineering materials. Doctorate programs are offered in: psychology, mathematics, biology, chemistry, physics; and in chemical, civil, electrical and mechanical engineering, and engineering materials; and in interdisciplinary studies.

In addition to the above four Faculties, there is the Faculty of Theology in Holy Redeemer College of Assumption University.

II. ATTENDANCE AND LENGTH OF COURSE

1. Regular Courses

Regular courses are offered in the winter session extending from September to May. In general, most courses are continuous throughout the year, but some half-year courses are also offered. Final examinations for half-year subjects of the first semester are written in December.

2. Extension Courses

Courses are offered through the Extension Division in evening classes during the winter session and in day classes during the summer school. Courses given in the Extension Division carry the same credit as those in regular winter session. Calendars dealing with Night School and Summer School programs are available from the Extension office.

Courses offered by the Gregorian Institute of America will be available each summer. These are open to both credit and non-credit students. A total of eight semester hours credit can be earned through this program. For further information, write to: The Gregorian Institute of America, 2132 Jefferson Avenue, Toledo, Ohio 43601.

3. Intramural Attendance and Length of Course

The number of years of attendance required for the attainment of any degree is as indicated in each program. This time may be reduced at the discretion of the Committee on Admissions through the transfer of credit from another university. In each case attendance at intramural classes for at least one full academic year or the equivalent (three summer sessions or three winter sessions part time, or a combination of these) shall be required.

In the case of programs leading to undergraduate degrees, a candidate may be excused attendance for not more than one full academic year or the equivalent through the transfer of credit obtained by correspondence courses through another university.

A student may take courses for credit in Summer Schools conducted by this or other institutions. Such courses, if approved, may be counted towards degrees. Day students enrolled at the University of Windsor must secure this permission from their Dean, even if they wish to take Summer School at the University of Windsor. Normally, no student, who enters the University with Junior Matriculation standing alone, will be permitted to obtain any Bachelor's degree in less than four complete academic years.

III. APPLICATION

A student who is attending a High School in Ontario should obtain application forms from his Principal or Guidance Officer. All other persons may obtain application forms by writing to:

The Admissions Officer
The University of Windsor
Windsor, Ontario, Canada.

Application forms should be completed and returned to the above address, together with the tuition deposit of $25 Canadian funds, payable by cheque or money order; if the student is accepted and registers, this deposit is credited to his academic fees. If the application (with the deposit of $25) is received before August 1, and the application is not accepted, or if the student cancels before August 1, the deposit will be refunded. If the application is received on August 1 or later, or if the student cancels on August 1 or later, there will be no refund for any reason.

A student from Ontario Grade 13 who wishes to be given early consideration on the basis of his complete high school record must complete his application before August 1 (see details under "Admission to First Year").

A student from outside continental North America must have his application complete and in the Admissions Office before July 1.

All other students should have their applications completed before September 1. No assurance is given that an application received after that date will be given consideration.

All applications **must** be complete by the last date of registration.

A student whose application is not complete by the regular registration period may be allowed to register provisionally (that is, allowed to attend classes while his application is still under consideration). If the file is not complete by the last day of registration, or if the student is not eligible for admission as a credit student, he will be allowed to continue on a non-credit basis only, as an **audit** student. (See "Audit Student").

Former students of this University who have not been registered here during the preceding calendar year are required to contact the Admissions Office before registering.

A student who wishes to apply for the second semester only, on a part-time basis, must have his application complete by December 15.

Transfer Student

An applicant who wishes to transfer (at any level) from another college or university must arrange for a complete transcript of his record and a statement of honorable dismissal to be sent to the Registrar directly by each institution previously attended.

Every student will be required to complete at least one full year or the equivalent at this University, including at least two courses in his major field. before qualifying for a degree.

Transient Student

A student who wishes to take a course for credit at this University, with the intention of transferring the credit to the university at which he was previously registered, must have the **written** permission of the Registrar of his home university in order to take the course.

IV. ADMISSION

General Requirements For Admission

Admission requirements to any part of the University are based on the student's achievement and ability. All applicants will be considered on the basis of total evidence presented: academic records, principal's recommendation, aptitude tests, etc. In special circumstances an applicant may be asked to come to the campus for tests and interviews.

Advanced placement will be granted to superior applicants, for high school subjects taken above the normal high school graduation level.

A student whose mother tongue is not English will be required to take the Michigan English Language Institute test as part of his requirements for application.

Specific requirements for admission to the various Faculties and programs are given with the description of these programs.
A student who satisfies the general admission requirements, but who lacks a specified subject required for admission to a particular program, is admissible to the University, but may be required to do additional work or take courses to remove the deficiency before being admitted to the subject for which it is a prerequisite.

A. REGULAR ADMISSION

The following are the requirements for regular admission. (Students lacking regular requirements may be admitted under special conditions; see "Special Admission").

1. To Preliminary Year

The University offers a Preliminary Year which consists of a full year of study equivalent to Grade 13 of the Ontario High Schools or to First Year of those universities which have a four-year General course. For the program of courses and academic regulations, see "Preliminary Year", p. C-22).

(a) **From Ontario Grade 12:**

In September 1967, the general requirement for admission to the Preliminary Year is completion in not more than four years beyond Grade 8 of the work required for the Ontario Secondary School Graduation Diploma in the five-year stream, with an average of at least 65% in the following subjects of Grade 12:

English and History

One language other than English

Latin or Mathematics

Two of: Mathematics, Science or Agriculture, Music, Geography, an additional language.

No option may be counted more than once. For the Music option, Grade III Theory, or Grade VII Practical and Grade II Theory, will be accepted. Applicants for the B. Comm. program must have completed courses in Intermediate Algebra and Plane Geometry. Applicants for the B.Sc. programs must have completed courses in Intermediate Algebra, Plane Geometry, Physics and Chemistry (or Agriculture); an average of 66% in these subjects is required of prospective engineers and of those intending to major in chemistry, mathematics or physics.

In September 1968, applicants for admission to the Preliminary Year must have standing in at least six Ontario Grade 11 and 12 subjects (excluding Physical Education), with an average of 65%. These subjects must include the following:

English

A language other than English

Mathematics (Parts I and II)

Science (Physics and Chemistry)

Geography (Parts I and II) OR History (Parts I and II)

This information on the 1968 entrance requirement is provided now for students who will be entering Grade 12 in September 1967.

(b) **From Outside of Ontario:**

An applicant who has completed High School work **in Canada outside of Ontario** should submit the Departmental or other official certificates (originals) to the Committee on Admissions for a decision regarding eligibility for entrance.

Graduation from a **United States High School** will admit to the Preliminary Year provided the applicant has completed at least 16 academic units (8 of which should be B grade or recommending grade), including 4 units in English, and sequences (at least 2 and preferably 3 units) in each of Mathematics, Science, Social Studies and one foreign language. In addition the applicant should have at least four academic subjects in Grade 12 with at least a B or recommending grade in three of them.

He must receive a favourable recommendation from his High School Principal, must obtain a score satisfactory to the Committee on Admissions on his aptitude tests, and should rank in the upper half of the class.

Highly qualified applicants from the United States will be given final acceptance after the first term marks of the final year of High School have been received, if the applicant meets the admission requirements at that time, provided that the graduation certificate is presented.

The General Certificate of Education of **Great Britain** (or an equivalent certificate from elsewhere in the Commonwealth) will admit to Preliminary Year provided it indicates satisfactory completion of five subjects at the Ordinary Level; English, Mathematics, another language, Science and Social Science will normally be required.

An applicant from **Latin America** must present a certificate showing satisfactory completion of the bachillerato necessary for admission to university in the applicant's own country.

2. To First Year

Admission to First Year of the University is obtained in one of the following ways:

(a) **From Ontario Grade 13:**

The general admission requirement is an average of 60% on a minimum of seven credits, including English and either another language or Mathematics A. Among the seven credits required, either Music or Art, but not both, will be acceptable as an option for admission to programs which allow for optional Grade 13 subjects. The following will not be acceptable: Secretarial Practice, Accountancy Practice, Mathematics of Investment, Problems.

Language of Grades 11 and 12 will be required, and Mathematics of Grades 11 and 12 normally will be required.

First Year applicants who present two or more Grade 13 credits from a previous year, will require a total of eight credits for admission.

The subjects required for admission to a particular program are shown with the specific admission requirements for each Faculty.

Credit value of Grade 13 subjects: Mathematics AB = 3 credits; English, all languages, and Mathematics A = 2 credits; all other subjects = 1 credit. (In September 1969, applicants for admission to the First Year must, in addition to the First Year requirements, have completed the Grade 12 requirements for September 1968 as listed on the previous page. This information is provided for the benefit of students entering Grade 12 in the fall of 1967 who plan to enter First Year in 1969.)

Early Acceptance

Admission of qualified students who have applied early will be decided in Spring on the basis of the total high school performance, Grade 13

term and recommended marks, and principal's recommendation. In the case of students who have doubtful or borderline qualifications, or who have spent more than one year in Grade 13, or who apply after August 1, decision on admission will be deferred until the Ontario Grade 13 results are available. In any case, the student is expected to write his Grade 13 examinations and to obtain his graduation diploma.

(b) **From Preliminary Year**

The satisfactory completion of the Preliminary Year prepares a student for admission to First Year of Arts, Science, Nursing, Engineering, or Commerce, provided the proper subjects are chosen.

(c) **From Outside of Ontario**

An applicant who has completed High School work outside of Ontario should submit the Departmental or other official certificates (originals) to the Committee on Admissions for a decision regarding eligibility for entrance.

The General Certificate of Education of **Great Britain** (or an equivalent certificate from elsewhere in the Commonwealth) will admit to the First Year provided it indicates satisfactory completion of five subjects, with two at the Advanced Level appropriate to the course chosen, or four subjects with three at the Advanced Level appropriate to the course chosen. Applicants for the Bachelor of Science and Bachelor of Applied Science programs must have completed Chemistry, Physics and Mathematics.

B. SPECIAL ADMISSION

1. **Probation**

A student lacking the full admission requirements may be placed **on probation** by the Committee on Admissions. Students who show unsatisfactory progress may be placed on probation by the Committee on Academic Standing of their Faculty. Probation is removed when the student passes his probationary period. The conditions for passing are the same as those for regular students. Should the student fail his year, he will not be allowed to repeat, but will be required to withdraw from the Faculty. For regulations pertaining to the possible re-admission of students who have been required to withdraw, see regulations pertaining to each Faculty.

In the case of a student who is on probation in part-time, extension or summer session studies, the student's progress report will be referred to his Academic Standing Committee after the completion of two courses; if the student's progress is not satisfactory, he may be required to withdraw at that time.

2. **Trial**

A student may be accepted into a particular course program on trial; if such student shows unsatisfactory progress or fails his year, he will not be permitted to repeat the same course program.

3. Adult Student

A student who lacks the regular admission requirements, and who is twenty-one years of age by December 31st of the year of application, and who has been out of full time formal Secondary School studies for three years or out of Grade 13 for two years, may be admitted to First Year on probation; prerequisites for a specific program are to be made up by additional courses or private study. The student's birth certificate must be submitted with his application. (For details concerning "Probation", see above). (Nurse students, see "School of Nursing".)

4. Audit Student

An audit student in any course is one who attends that course without credit towards a degree or program, and who is not entered or registered on the official University records or lists, for purposes of academic or degree credit or transcript. Such a student will not be allowed to write examinations and cannot be graded in any way. He will normally pay the regular fees for the course(s) or program.

5. Transfer Student

A student may transfer from another college or university, but will be required to complete at least one full year or the equivalent at this University, including at least two courses in his major field, before qualifying for a degree. For details of application, see p. B-5. (Nurse students, see "School of Nursing").

6. Transient Student

A student may take courses for credit at this University, for the purpose of transferring the credit to the university at which he was previously registered. He must have the **written** permission of the Registrar of his home university in order to take the course.

V. REGISTRATION

1. Counselling

At registration a course consultant will be provided who will render the student every assistance in planning his program. **Nevertheless, the responsibility for familiarizing himself with the requirements for degrees and with academic regulations rests primarily with the student himself.** At registration, no student may take an **additional course,** or make any other exception to the approved program as outlined in the calendar without **written permission from his Dean.**

2. Time and Place of Registration

Each student must register at the beginning of each session at the time and place designated by the Registrar. Although the courses selected may be offered in different Colleges of the University, all students register through the Registrar's Office.

Students who fail to register at the time and place fixed by the Registrar will be required to pay a late registration fee (see "Fees").

Unless there are exceptional reasons known in advance, no student will be permitted to register later than three weeks after the beginning of classes.

3. Provisional Registration

A student whose application is not complete by the regular registration period may be allowed to register provisionally. All required forms and documents must be submitted before the last day of registration. If the file is not complete by that date, or if the student is not eligible for admission as a credit student, he will be allowed to continue on a non-credit basis only, as an audit student (see previous page).

4. Change of Registration

Once a student has registered, he may not **change his course, or add or drop subjects** without **permission from his Dean,** or, in the case of students in the Extension Division, without permission of the Director of Extension. If any change in fees, or refunds, are involved the student will also see the Cashier's Office. (See "Fees").

Any subject dropped without the permission of the Dean will be regarded as a failure.

Students who are forced to withdraw from the University or from a course must notify the Dean's office in writing, giving the reason for the withdrawal.

5. Classification of Students

A full-time student is one who is registered in four or more full undergraduate courses.

A regular student is one who has satisfied all the admission requirements and is pursuing the course program as outlined in the calendar.

A conditioned student is a student who, in any year, does not have standing in a required subject or subjects of a preceding year.

A special student is a student taking courses for credit but not proceeding to a degree at this University.

A probationary student is one who shows unsatisfactory progress and has been placed on probation by the Committee on Academic Standing of his Faculty. For particulars, see "Probation".

6. General Regulations

No student who is employed full-time will be permitted to attempt more than three full courses in the winter session, nor more than one full course in the summer session.

Every student entering the University in Preliminary or First Year is required to complete satisfactorily a course in Library Science, except those who have completed similar work at Teachers' College.

Any student of any year who shows an unsatisfactory knowledge of spoken or written English must do additional assignments until his work satisfies his instructors.

A student who wishes to participate in more than one extracurricular activity (on or off campus), or who wishes to undertake employment during an academic session, must obtain permission from his Dean before engaging in such activity.

VI. EXAMINATIONS

The following regulations apply to students in all faculties. For specific regulations regarding supplemental examinations for each Faculty, see the academic regulations pertaining to the respective Faculty.

For courses offered in one Faculty, exclusively for students of another, the regulations of the Faculty in which the student is registered will apply. For courses taken by students of one Faculty in another, the regulations of the Faculty in which the course is offered will apply. In the event that special consideration is required for individual students in one Faculty concerning courses being taken in another, the Dean of the Faculty in which the student is registered shall make recommendations to the Dean of the Faculty in which the course is offered.

1. Regular Examinations and Term Work

The regular examinations will be held in December and May. If a student writes more than one examination in a course, the last mark he obtains shall be the only one considered for academic credit.

The ratio of **term-work** marks to examination marks is determined by the teaching staff in each subject; neither term mark nor examination mark, however, will count for less than one-third nor more than two-thirds of the final grade. To pass a subject a student must obtain an average of 50% on term work and examination; his Senate Committee on Academic Studies, however, may at its discretion withhold credit if the mark in either term work or examination is below 50%.

Term work in a course will not be credited to a student beyond the year in which the course is taken.

2. Supplemental Examinations

A supplemental examination is one allowed in a subject in which a student (who has not failed his year) has failed to obtain standing at the regular examination. This examination is held at a time designated by the Dean. The fee is $10.00 if written at a regular examination period, and $20.00 if written at another time or place. A student granted permission to write a supplemental examination must avail himself of this privilege at the first opportunity and the time and place designated.

Applications for the August supplemental examinations must be in the Registrar's Office by July 1; forms for this purpose are available in the Registrar's Office.

The final grade, after supplemental examinations, will include the term mark for the year. The final mark so obtained replaces the original final examination mark in calculating the student's grade.

A student who has failed his year is not permitted to write any supplemental or special examinations on the work of that year.

3. Special Examinations

A special examination, is an examination other than the regular or supplemental examination, permitted by the Dean for a grave reason and after special application. No special examination may be assigned except on the recommendation of the Head of the Department concerned, after consultation with the instructor involved. (Often students should be advised to adopt the alternative of repeating the lectures and taking the next regular examination).

A student who fails to appear for a paper at the time set on the examination timetable will not be allowed to write on the examination paper thus missed, but may be permitted to write a special examination upon fulfillment of the conditions indicated in the above paragraph at a time determined by the Registrar after consultation with the Department and instructor involved.

The fee for a special examination is $10.00 if written at a regular examination period, and $20.00 if written at another time or place.

4. Conduct of Students During Examinations

A candidate writing an examination will write on the paper provided for him; he may not talk to another candidate; he may not copy from another nor allow another to copy from him; he may not bring into the examination room any printed or written material (except such aids as may be specifically permitted for a candidate writing a particular subject).

Any violation of these rules will be regarded as a serious offence, and may lead to the cancellation of the paper(s) of the offending student and even to his expulsion from the University.

5. Failures

For information regarding failures, withdrawal and re-admission see specific regulations pertaining to each Faculty.

6. **Appeals**

(i) **Aegrotat Standing:** A student who wishes to receive consideration on account of serious illness or bereavement or other grave reason prior to or during the examination should communicate with the Registrar's Office before the close of the examination period and should submit supporting documents (e.g., a medical certificate) within a week. In such cases the Committee on Academic Standing may grant standing in the subject or subjects concerned on the basis of the term mark alone.

(ii) **Other Appeals:** While all papers in failed subjects are re-read before the grades are submitted to the Registrar's Office, and every care is taken to record marks accurately, any student who considers that some factor affecting the final mark on the examination was not considered by the examiner, may appeal to have the subject reviewed. This request should be submitted in writing to the Registrar's Office within two weeks of the official release of student grades, together with a fee of $10.00. In the event that the grade is changed as a result of the appeal, the fee will be refunded.

Appeals should be addressed to the Secretary of the appropriate Faculty, and sent to the Registrar's Office.

VII. GRADUATION

Registration in any program does not constitute an application for a degree or diploma.

An official application for graduation must be filled out and filed in the Registrar's Office thirty days prior to the Convocation at which the applicant hopes to graduate.

In cases in which credit is sought for work done elsewhere, official transcripts or other documentary evidence required by the Registrar's Office, not already submitted, must be conveyed to the Registrar's Office prior to the same date. Failure to comply with these regulations will disqualify the student for graduation at the Convocation concerned.

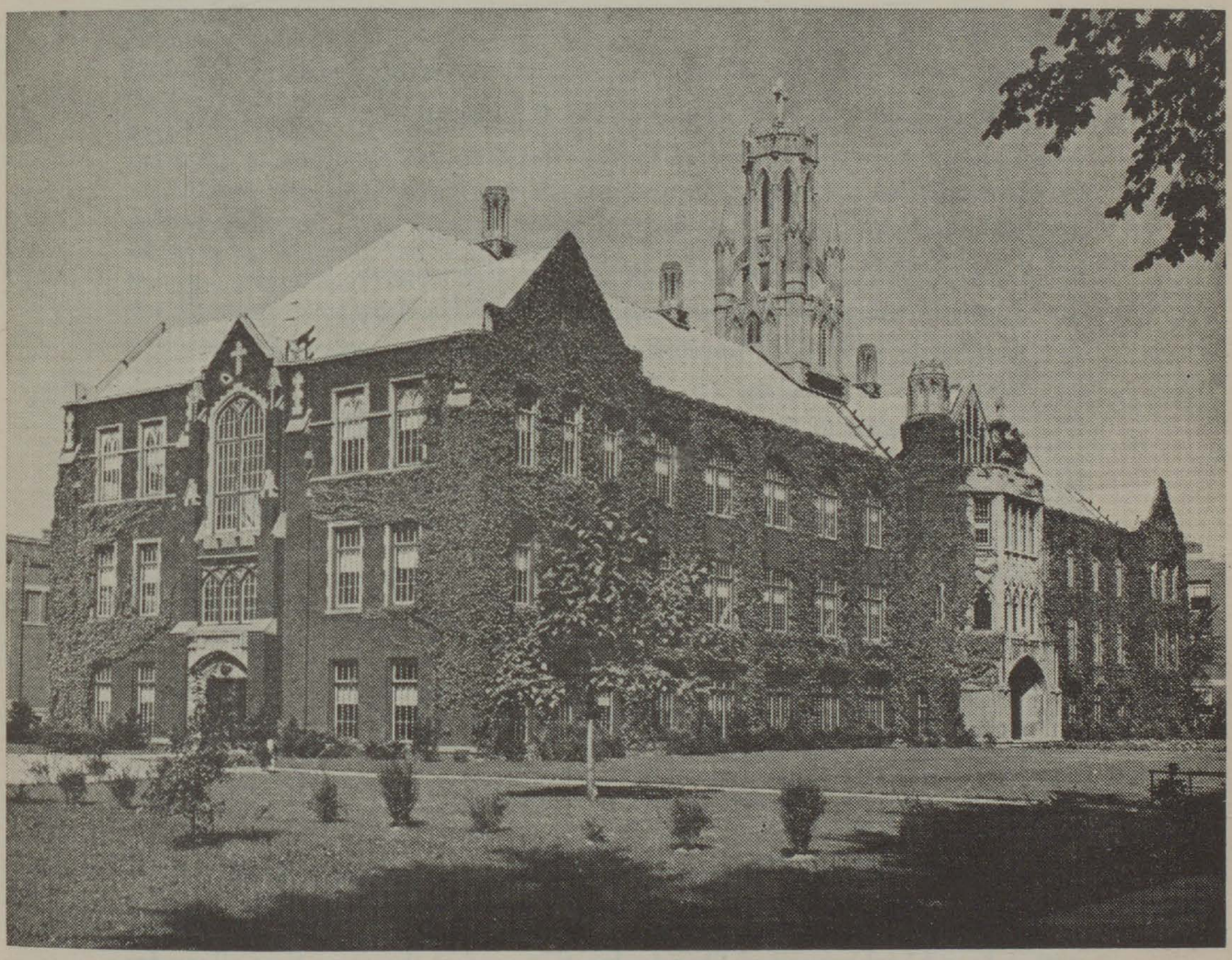
Each prospective graduate must be present in person at Convocation in order to receive his degree, unless excused for a serious reason by his Dean, and unless arrangements have been made with the Registrar to receive the degree in absentia. (See "Fees").

See also the particular regulations for each Faculty.

ANNUAL MEDICAL REQUIREMENT

Athletes are required to attend annually upon their own physician and present to the University on the University's prescribed form, a certificate as to physical fitness.

THE FACULTY OF ARTS AND SCIENCE



Dillon Hall

FACULTY OF ARTS AND SCIENCE

THE SENATE COMMITTEE ON ARTS AND SCIENCE STUDIES

The Dean of Arts and Science (Chairman); the President; the Vice-President; the Registrar (Secretary); the Associate Deans of Arts and Science; the Principals of federated and affiliated Colleges; the Directors of Schools and Heads of Departments in the Faculty of Arts and Science; the Director of Extension; two members of the Faculty of Arts and Science elected to the Senate; one representative appointed by the Dean from each of the Sections in Arts and Science.

I. GENERAL INFORMATION

Programs

The Faculty of Arts and Science comprises the following programs:

a) General course in Arts leading to the B.A. degree.
b) Honours courses in Arts leading to the B.A. degree.
c) Honours course in Fine Arts leading to the B.F.A. degree.
d) Honours courses in Music leading to the B.Mus. degree.
e) General course in Science leading to the B.Sc. degree.
f) Honours courses in Science leading to the B.Sc. degree.
g) Certificate in Public Administration (by Extension only).
h) Certificate in Theology (by Extension only).
i) Degree course in Nursing leading to the B.Sc.N. degree.
j) Diploma courses in Nursing.
k) Degree courses in Physical and Health Education leading to the degrees of B.P.E. and B.P.H.E.
l) Diploma in Social Work.

The Preliminary Year

This year is taken by all students who enter the University from Grade 12. The subjects chosen will depend on whether the student intends to enter Arts, Science, or Commerce (see p. C-22).

The General Course

The General course in Arts or Science requires three years' work beyond Grade 13 (Province of Ontario) or beyond Preliminary Year. This course is elected by the majority of students in the University. It provides a student with a broad background of liberal education, and at the same time allows for a field of concentration, called a **major field.** Majors are offered at the present time in the following fields:

In Arts: Drama, Economics, English, Fine Arts, French, Geography, German, History, Home Economics, Latin, Mathematics, Music, Philosophy, Political Science, Psychology, Sociology, Spanish, Theology.

This program may be arranged to suit the needs of students planning to enter law, teaching, social work, personnel work, theology, or any profession requiring a good, general background in the Liberal Arts.

In Science: Biology, Chemistry, Geology, Mathematics, Physics.

This program may be arranged to suit the needs of students planning to enter teaching, industry, dentistry, medicine, pharmacy, or any profession requiring a background in Liberal Arts with emphasis upon the natural sciences and mathematics.

Honours Courses

Honours courses require four years of work beyond Grade 13 (Province of Ontario) or beyond Preliminary Year. They provide for a greater concentration in a given field of study than does the General course, and demand a higher level of achievement. Through these courses, students are prepared for graduate study, research positions, high school teaching, and several other professions. At the present time Honours courses are offered in the following fields: Biology, Chemistry, Drama, Economics, English, Fine Arts, French, Geography, History, Latin, Mathematics, Music, Philosophy, Physics, Political Science, Psychology, Sociology, Speech, Theology, and combinations of these. An Honours program in Geology is under consideration; details will be announced later.

School of Nursing

The course leading to the Bachelor of Science in Nursing degree (B.Sc.N.) with majors in Nursing Education, Public Health Nursing and Nursing Service Administration, requires two full years of University work beyond Grade 13 (Province of Ontario) or beyond Preliminary Year, in addition to the three years normally required to obtain registration as a nurse in an approved Hospital School of Nursing. In addition to the degree program, the School of Nursing offers Diploma courses in the major areas listed above.

For students admitted in September 1967, the degree program, including preparation for teaching, nursing service administration, and public health nursing, will require three full years beyond Ontario Grade 13 or beyond Preliminary Year. In addition, applicants for the degree program must hold Nurse Registration for the current year and have one year's work experience following nurse registration. In September 1968, Diploma programs in Nursing Education and Nursing Service Administration will be discontinued.

School of Physical and Health Education

The School of Physical and Health Education is yet another addition to the rapidly expanding program being developed by the University of Windsor. Within the framework of the School of Physical and Health Education are academic programs leading to a Bachelor of Physical and Health Education, and Bachelor of Physical Education; athletics covering intercollegiate, interfaculty, extramural and intramural competition; and a recreation program.

The Bachelor of Physical and Health Education degree may be acquired by successfully completing the four year Honours program. The Bachelor of Physical Education degree is conferred upon the successful completion of a concentrated year of Physical Education and is open to students who have a B.A. or B.Sc.

Social Work

The program consists of two parts:

(a) A three year General Arts program leading to the B.A. degree.
This program gives the student the basic knowledge of humanities and social sciences. While designed to provide the educational background and foundation for a career in Social Work, graduates of this program who decide not to enter Social Work will find themselves qualified for other fields such as teaching, guidance, personnel work, etc.

(b) A program extending through three summers of twelve weeks each leading to a Diploma in Social Work.

This program may be taken concurrently with the degree program in (a). It is also open to graduates of this or other universities, who are interested in improving their qualifications for social work.

On completion of the above programs, graduates may enter employment with the social agencies or may elect to continue their education to the Master's level. Plans are under consideration for the establishment of a Graduate School of Social Work at the University of Windsor and courses will be so arranged that graduates of the Arts and Diploma programs will be admitted to the final year of the Master's program.

Negotiations are also underway to arrange for the admission of these students with advanced standing to Graduate Schools of other Universities.

Extension Courses

For students who are unable to attend day classes during the winter session, the University offers courses in evening and summer school. These courses have the same content and standards as those offered in the regular day classes of the winter session. No correspondence courses are offered by this University. For complete programs available through Extension courses see the calendar for "Division of Extension".

PRE-PROFESSIONAL COURSES

Students intending to seek admission to graduate and professional schools should choose their options in accordance with the requirements for admission to these institutions.

a) **Teaching**

Students intending to enter the teaching profession through the Ontario Colleges of Education may qualify for the Ontario High School Assistants' Certificate either Type B or Type A.

1. Type B. The academic standing for admission to the course in the Ontario Colleges of Education leading to a High School Assistants' Certificate, Type B, is a degree in Arts, Science, Commerce, Applied Science or Household Science from a British University, based upon courses approved by the Minister of Education.

A prospective High School teacher must include at least seven full subjects (twenty-one year credits) in at least two High School teaching subjects in his undergraduate curriculum as required by the Ontario Colleges of Education. It is further recommended that he major in a High School teaching subject to qualify for an endorsed certificate.

2. Type A. In the Honours programs, provision is made to satisfy the requirements for admission to the Ontario Colleges of Education for the High School Assistant's Certificate Type A. Some of the programs are approved by agreement with the Minister of Education, others have been designed to satisfy the minimum requirements by the proper choice of options. For specific details, see the note at the beginning of each Honours program.

Graduates in other Honours courses or in General courses who wish to obtain Type A standing in English, English and History, History, Mathematics, Mathematics and Physics, Science, Physics and Chemistry, Physics and Biology, Chemistry and Biology should consult the Registrar.

b) **Pre-medicine**

A student intending to apply for admission to a School of Medicine should take the pre-medical program as outlined under General B.Sc. program. The student is advised to study carefully the requirements of the particular Medical School to which he seeks admission, as there is some variation, both with respect to choice of subjects and number of years' study required for entrance. The student should consult the head of the Department of Biology early in his program with respect to his choice of subjects.

c) **Pre-dentistry**

A student intending to qualify for admission to the First Dental Year at the University of Toronto should complete the program for First Year Science with the following courses: English 15, Chemistry 10, Physics 13, Zoology 10, Botany 10, French 12 or German 12 or Latin 12 or Philosophy 15 or Sociology 12.

d) **Pre-medical Technology**

A student intending to enter a **school of medical technology** will follow the same program as biology majors.

e) Pre-optometry

A student seeking to qualify for admission to **optometry** is advised to complete First Year Science with Physical Science option, substituting Zoology 10 and Psychology 15 for Chemistry 10 and Theology or a History.

f) Pre-pharmacy

A student intending to qualify for admission to Second Year Pharmacy should complete the program for First Year Science with the following courses: Botany 10, Chemistry 10, Mathematics 15, Physics 13, Zoology 10, plus one of English 15 or French 12 or Philosophy 15 or German 12 or Latin 12 or Politicial Science 12 or Sociology 12. (Students completing the program may transfer to Second Year Pharmacy at the University of Toronto, provided the requisite average has been attained.)

II. ACADEMIC REGULATIONS

Admission Requirements to FIRST YEAR from Ontario Grade 13 (see also "Regular Admission", p. B-5).

Credit value of Grade 13 subjects: Mathematics AB = 3; English, all languages, Mathematics A = 2; all other subjects = 1. DEGREES AND PROGRAMS	GRADE 13 SUBJECTS REQUIRED FOR SPECIFIC PROGRAMS
	An average of 60% on a minimum of 7 credits, including the subjects indicated below. Language of Grades 11 and 12 is required, and Mathematics of Grades 11 and 12 is normally required.
BACHELOR OF ARTS General courses with majors in Drama, Economics, English, Fine Art, Geography, History, Home Economics, Languages, Philosophy, Political Science, Psychology, Sociology, Theology	English; another language or Mathematics A; and at least 3 more credits.
General course with major in Music	English; Language or Mathematics A; Music (Grade II Theory and Grade VIII Practical); and at least 2 other credits.
General course with major in Mathematics Honours Economics Honours Philosophy & Mathematics	English; Mathematics A and B; and at least 2 other credits.
Honours Drama & English Honours Drama & Speech Honours Economics & History Honours Economics & Political Science Honours Economics & Sociology Honours English Language & Literature Honours English & History Honours English & Spanish Honours Geography Honours History (Economics option) Honours History (Philosophy option) Honours History & Theology Honours International Relations Honours Philosophy Honours Philosophy & Psychology Honours Political Science Honours Political Science & History Honours Political Science & Sociology Honours Psychology Honours Psychology & Sociology Honours Sociology & Anthropology Honours Theology & Philosophy Honours Theology & Psychology Honours Theology & Sociology	English; another language or Mathematics A; and at least 3 other credits. (For students entering an Honours English or Honours French program, Latin is recommended as an option.)

DEGREES AND PROGRAMS	GRADE 13 SUBJECTS REQUIRED FOR SPECIFIC PROGRAMS
Honours English & French Honours French & Spanish	English; French; and at least 3 other credits. (Latin is recommended.)
Honours English & Latin	English; Latin; and at least 3 other credits.
Honours English & Philosophy (Language option)	English; French or Latin; and at least 3 other credits.
Honours French & Latin Honours Philosophy & Latin	English; French; Latin; and at least one other credit.
Honours Mathematics Honours Psychology & Science	English; Mathematics A and B; Physics; and at least one other credit.
BACHELOR OF FINE ART Honours course	English; Language or Mathematics A; and at least 3 other credits.
BACHELOR OF MUSIC Honours course in History and Theory, or in School Music	English; Language or Mathematics A; Grade VIII Practical and Grade II Theory or equivalent; and at least two other credits. (A student who does not have Music as an option may be admitted to the program with the consent of the Department.)
BACHELOR OF SCIENCE General courses with majors in Biology, Pre-medicine, Pre-dentistry, Pre-optometry, Pre-pharmacy, Pre-medical technology; Honours Biology	English, Mathematics A, Chemistry, Physics, and at least 1 other credit (Mathematics B or Biology is recommended).
General courses with majors in Chemistry, Geology, Mathematics, Physics Honours Biophysics Honours Chemistry & Biology Honours Chemistry Honours Chemistry & Physics Honours Mathematics Honours Physics	At least English, Mathematics A and B, Chemistry, Physics. An average of 60% in Mathematics and Science is required.
BACHELOR OF SCIENCE IN NURSING Majors in Nursing Education, Nursing Service Administration, Public Health Nursing	English; Biology; Chemistry; and other subjects to make up at least 7 credits. (Physics is recommended.)
BACHELOR OF PHYSICAL AND HEALTH EDUCATION	English; another language or Mathematics A; and at least 3 other credits.

The following certificates will be accepted in place of the one Grade 13 paper in Music: Grade IV Theory, OR Grade VIII Practical and Grade II Theory. In considering a candidate for admission, the Committee on Admissions will consider total evidence presented, e.g. examinations and grades, principal's recommendation, class standing, aptitude and ability tests, etc. For regulations concerning those who lack full admission requirements, see "Special Admission" (p. B-8).

If an applicant has spent one year in Grade 13 and lacks the minimum admission requirements, he may not be admitted to either the First Year or to the Preliminary Year, but must complete the entrance requirements for First Year by further high school work.

A student who has spent more than one year in Grade 13 will be expected to have complete Grade 13 requirements.

Registration

1. For regulations regarding application, see "Application" (p. B-4).
2. All applicants, when notified of their acceptance, are subject to the general regulations regarding registration (see "Registration", p. B-9).

Examinations and Grading

All students are subject to the general regulations pertaining to examinations (see "Examinations", p. B-11).

The grading for individual subjects in General and Honours programs is as follows:

	In General Program	In Honours Program
75-100:	Grade A	1 Class
66- 74:	Grade B	2 Class
60- 65:	Grade C	3 Class
50- 59:	Grade D	4 Class
40- 49:	Grade Fx	F
0- 39:	Grade F	F

At the regular Spring Examinations all grades below 50% are considered failures. If a student is permitted a supplemental examination, it is indicated by **Fx.**

Term Work

In all subjects, the ratio of term-work marks to examination marks is determined by the **teaching staff of the Department;** neither term mark nor examination mark, however, will count for less than one-third nor more than two-thirds of the final grade. To pass a subject, a student must obtain an average of 50% on term work and examination; his Faculty Council, however, may withhold credit if the mark in either term work or examination is below 50%.

Term work in a course will not be credited to a student beyond the year in which the course is taken.

Ranking of Students

In the **General Courses,** students are ranked in order of merit according to the average grade in all subjects prior to supplementals. The minimum for Grade A is 75% of the marks obtainable; for Grade B, 66%; for Grade C, 60%; for Grade D, the minimum passing grade, 50%.

In the **Honours Courses** in any department, students are ranked in order of merit in that department in four classes. Those who obtain 75%, or over, of the total number of marks will be placed in Class I; those who obtain 66% to 74% will be placed in Class II; those who obtain 60% to 65% will be placed in Class III; those who obtain between 50%, the minimum for pass, and 59%, will be placed in Class IV. The average of Honours students will be calculated as the general average of all courses in II Year, and the average of Honours subjects exclusively in III and IV Years.

REGULATIONS FOR GENERAL COURSES

1. **Additional Subjects:** A student who has a B average in Second Year may take an additional subject (additional to the prescribed program for that year) in Third Year. Other students may not carry additional subjects except with the written permission of the Dean. In each case the additional subject will be included in calculating the average for the year.

2. **Reduced Programs:** No full-time student in the General Course of Arts and Science will be permitted to take less than the prescribed program for his particular year unless for a sufficient reason he has been excused by the Dean. In no case will a full-time student be permitted to register in less than four full courses (see "Registration", page B-9).

3. **Change of Registration:** Once a student has registered, he may not change his course, or add or drop subjects without the written permission of the Dean.

Any subject dropped without the permission of the Dean will be regarded as a failure.

Unless there are exceptional reasons, no student will be permitted to begin a new course later than the third week of lectures in the course concerned.

4. **Honours Subjects in the General Course:** A student in the General course may, with the consent of the Dean and the department concerned, substitute an Honours subject in place of a general course subject in his major field, provided he has the necessary prerequisites, and fulfills the conditions attaching to an Honours subject.

A student in the General course who is taking an Honours subject and fails to obtain a passing grade therein, may be permitted to write a supplemental examination in the equivalent subject of the General course and receive credit for the General course subject.

5. **Promotion and Graduation:** For promotion from year to year in the General Course, a full-time student must fulfill the following conditions at the spring examinations:

a) Obtain a general average of at least 50% in all subjects;

b) Obtain a passing grade in at least four full courses;

c) Not fail (below 50%) in more than two full courses (or the equivalent in half courses);

d) A repeating student must obtain passing grades in all his subjects or an overall average of 60%;

e) A student in Second Year must, in addition to the above conditions, obtain a Grade C (60%) or better, in at least three full courses, **or an overall average of Grade C on his work for the year,** by the conclusion of the supplemental examinations.

Any student who does not fulfill the above conditions will be deemed to have failed his year and shall not be entitled to write supplementals but shall lose credit in all subjects of that year in which he has obtained less than 66%.

No student will be admitted to a Bachelor's degree who has not:

a) Obtained at least Grade D on all the prescribed and elective work of his course;

b) Obtained a Grade C (60%) or better in at least half of the courses in his senior year, or an overall average of at least Grade C on the work of his senior year;

c) Obtained an average of Grade C in all the courses in his major subject belonging to the Second and Third Years, exclusive of minor requirements.

(See also "General Regulations" re Graduation, p. B-13).

6. **Failures**

i) **Failure of a subject:**

To pass a subject a student must obtain an average of 50% on term work and examination; the Senate Committee on Arts and Science Studies, however, may at its discretion withhold credit if the term mark or examination is below 50%.

If the mark obtained in a subject is in the range 40-49%, a student may be allowed to write a supplemental examination (see below).

A student who has been allowed to write a supplemental examination, and fails to obtain 50% in it, will not be eligible for re-examination without a further year's attendance in the course in which he has failed.

A student who has failed a prescribed course, must repeat that course the year after failure, no matter what subject or subjects must be postponed.

A failed course may be repeated once only.

A student who has failed in the work of the preceding year will not be permitted to take subjects in the following year which depend on the work of that year.

Term work in a course will not be credited to a student beyond the year in which the course is taken.

ii) **Failure of a year:**

A student who has failed to meet the requirements for promotion as listed above, has failed his year.

A student who has failed his year is not permitted to write any supplemental or special examinations on the work of that year, but will be allowed to retain credit in subjects in which he has obtained 66% or better.

A student on probation who fails his year may not repeat the year but will be required to withdraw from the Faculty of Arts and Science.

A student who is required to repeat his year must obtain a passing grade in each individual subject of his approved registration or an overall average of 60%, at the following spring examinations. If he fails to meet this requirement he will be required to withdraw from the Faculty of Arts and Science.

A full time student in the general course who fails his year and who has already failed a year (either here or elsewhere) will be required to withdraw from the Faculty of Arts and Science.

iii) **Readmission of students who have been required to withdraw for academic reasons:**

Students who have been required to withdraw from the Faculty of Arts and Science after either, 1) failing a probationary year in a general course or 2) failing a second time, will withdraw for one complete year from all regular and extension courses. They may then reapply to the Senate Committee on Admissions for readmission to a general course. The committee may refuse the petition for admission, admit to part-time day or extension courses only, or admit to full time. Such students, if re-admitted, will be subject to the regulations applying to repeating students.

Students who have been required to withdraw a second time, will not be eligible for readmission under any conditions.

7. **Supplemental Examinations:** Supplemental examinations are permitted to a student in subjects of the General course in which he has obtained a Grade Fx (40%-49%), provided he has not failed his year.

No student will be allowed to write supplemental examinations in more than two full courses, or the equivalent in half-courses, in any one year.

In determining the final grade after a supplemental examination, the student's term mark in this subject will count for not less than 33% and not more than 66% of the final mark.

If a student, who has been granted permission to write a supplemental examination in a subject, either does not write, or fails to obtain 50% after the examination, he may not write further supplemental or special examinations in the course involved, but must repeat it in its entirety to obtain credit for it.

A student intending to write a supplemental examination must apply to the Registrar's Office by the date set by that office and pay the appropriate fee. (See also p. B-11).

REGULATIONS FOR HONOURS COURSES

1. **Admission:** For admission to the Second Year of any Honours program, a student must have completed First Year of the General course program with the subjects and grades specified for the particular Honours program he desires to enter.

2. **Promotion and Failure:** For promotion from year to year in an Honours program, a student must obtain at least 60% average (III Class Honours), in the prescribed Honours subjects of the year and an overall average of at least 60%. A student who does not fulfill these requirements will not be permitted to continue in Honours but will be required to repeat his year or transfer to the General course subject to the regulations set forth above for the General course program.

The year average of Honours students will be calculated as the general average of all subjects in II Year, and the average of Honours subjects exclusively in III and IV Years.

A student who fails to obtain 50% in one Honours subject will be allowed to continue in Honours if his year average as calculated in the preceding paragraph is 60% or better.

No supplementals are allowed in Honours subjects. With regard to subjects of the General course included in an Honours program, the regulations regarding supplementals for the General course given above are applicable.

3. **Comprehensive Examinations:** In addition to the regular examinations, various departments have introduced **comprehensive examinations** for Honours students. These examinations, partly oral and partly written, are given at the end of the senior year and cover the broad aspects of the student's Honours course.

Students in the Fourth Year of certain Honours programs be required to write the Graduate Record Examinations for which they will be assessed a fee of $12.50.

4. **Transfer to General Course:** If a student at the end of II Year Honours transfers to the General course, he shall be required to take all subjects of III Year General.

If a student in III Year Honours transfers to the General course he will not be eligible for a degree unless he has completed all the required subjects of the General course.

A student in Fourth Year of an Honours course, who, at the final examinations, fails to obtain the average of 60%, will not be admitted to an Honours degree but may, on the recommendation of the Committee on Academic Standing, be awarded a degree in the General course provided he has obtained 50% in each course of his final year. The candidate may write subsequent examinations for the Honours degree.

Graduation: For regulations pertaining to graduation, prospective graduates are referred to "General Regulations", p. B-13.

COURSE CHART

GROUP A HUMANITIES	GROUP B SOCIAL SCIENCES	GROUP C LANGUAGES	GROUP D SCIENCE AND MATHEMATICS
FIRST YEAR			
Asian Studies 10 English 15 Fine Art 10 Drama 10 History 10, 25 Music 11 Philosophy 15 Theology 10R, 18R, 10A, 18A, 10U, 18U	Anthropology 10 Economics 15, 19 Philosophy 22 Political Science 12 Psychology 15 Sociology 12	French 4, 11, 12, 13, 14 German 4, 12 Greek 4, 12 Latin 4, 12 Spanish 3, 4, 12 Russian 4, 12	Biology 11* Botany 10** Chemistry 10** Geography 10* Geology 10* Mathematics 11, 13*, 15** Physics 10, 13** Zoology 10** Home Economics 10*
SECOND YEAR			
Asian Studies 20 Greek 37 Fine Art 20, 23, 24 Drama 22, 25, 28 History 22, 24, 25, 27 Music 20, 21, 28 English 20, 24, 25, 26, 27 Phil. 21, 23, 24, 25, 26, 27, 28, 29 Speech 20, 24 Theology 20R, 24R, 28R, 29R, 20A, 24A, 28A, 20U, 22U	Anthropology 28 Economics 21, 23, 24, 27ab Geography 23, 24 Philosophy 25 Pol. Sc. 20, 23 Psychology 22, 26ab, 28 Sociology 23, 24, 25, 29	French 22y, 23y, 27 German 21, 22y, 23y Latin 21, 22, 25 Spanish 20, 21, 22y	Biology 16a, 28a, 29b Chemistry 22, 23, 24, 24y Geography 25 Home Economics 25ab, 27 Geology 20, 23a, 24b, 25 Botany 22ab Mathematics 20a, 25, 27ab, 29a Physics 22, 23, 25b, 26, 29* Microbiology 16b, 26 Zoology 22
THIRD YEAR			
English 30, 31, 32, 33y, 38, 39 Fine Art 30, 32, 33, 34 History 30, 32, 34, 35, 37, 38 Drama 34, 38 Music 31, 38 Phil. 30, 31, 32, 34, 35, 36, 37, 38, 39 Speech 30, 32 Theology 30R, 31R, 34R, 35R, 30A, 34A, 30U, 38U, 39	Anthropology 31, 32 Economics 31, 35, 36 Geography 34, 37 Philosophy 39 Pol. Sc. 30, 33, 35, 36 Psychology 30, 31, 34 Sociology 31, 35, 37	French 31, 37 German 31, 34 Latin 31, 35, 38 Spanish 30, 31, 32y, 37, 38, 39y	Biology 30b, 34*, 35*, 37a, 38c Chemistry 33, 34, 36 Geography 32, 35, 36, 38 Home Economics 30, 31, 37 Mathematics 30, 31a, 33b, 35ab, 37 Microbiology 31a, 32b, 33b Botany 30a, 34, 35b, 36, 37 Physics 31, 34, 36 Zoology 30a, 34a, 35b, 36, 37

*Denotes those subjects in Group D which may be taken as electives by non-science majors.

**Students fulfilling the major and minor requirements in Biology, Chemistry, Geology or Physics will be awarded a B.Sc. degree; students fulfilling requirements in Mathematics may be eligible for either the B.A. or B.Sc. depending upon the program selected; majors in other subjects lead to the B.A. degree. See "Details of Subjects" (p. C-59 ff.) for specific requirements.

Curriculum requirements:

1. The program for the General course will consist of 16 courses (beyond the level of Grade 13 or Preliminary Year) selected from four groups of subjects:

A — Humanities
B — Social Sciences
C — Languages
D — Science and Mathematics

as listed on the previous page.

2. Subjects in each year shall be selected as follows:

I Year — 6 courses from at least 3 groups:

For B.A.: at least 1 from group A
at least 1 from group B
at least 1 from C or D

For B.Sc.: at least 1 from group A
at least 1 from group B or C
at least 1 from group D

II Year — 5 courses selected from at least 2 groups

III Year — 5 courses selected from at least 2 groups

3. Every program must include:

i) a major consisting of at least 5 courses and not more than 7 in one subject as specified by the department concerned,

ii) a minor consisting of at least 3 courses and not more than 5 in one subject as specified by the department concerned,

iii) electives to make up a total of 16 courses provided that not more than a total of 12 courses are selected from one group.

4. It is recommended that the subject in which a student intends to major be included in the six courses of I Year.

Students intending to major in Mathematics must take Mathematics 11ab and Mathematics 15 in I Year; students intending to major in Economics must take Economics 19; students intending to major in French are advised to take French 14.

5. For specific major and minor requirements for the various departments see "Details of Subjects", p. C-59.

Students intending to enter an Honours program must take the subjects of I Year prescribed for admission to the II Year of that Honours program.

6. a) Electives will be chosen in consultation with the department in which the student is majoring.

b) In any year a student may choose subjects from another year provided that prerequisites are satisfied and the subject is available without clash of time table.

c) Not more than 8 of the 16 courses may be selected from those numbered less than 20. Of those numbered below 10, no subject may be taken for credit with the exception of a beginning language course 2, 3 or 4.

d) Electives may also be selected from Business Administration, Social Work, Physical Education and courses outside the Faculty of Arts and Science subject to the consent of the Faculty, Department or School concerned and the Head of the Department in which the student is majoring. Not more than **two** such courses may be credited towards a degree.

7. For special programs in Social Work, Physical and Health Education, Nursing consult the appropriate description in the University calendar.

Extension students may receive necessary counselling at the Extension Office. If, however, a part-time student is registered in both the day and evening divisions, his counselling will be at the office of the Dean of his Faculty.

GUIDANCE CHART FOR GENERAL COURSE B.A. & B.Sc.

The following chart shows the departments in the Faculty of Arts and Science, the subjects in which a major field of concentration is offered, the subjects constituting a major, suggested minor fields to accompany a given major field and suggested options. The last two columns show the subjects constituting a minor and suggested options for those students majoring in another field. The chart is intended as a guide to students and their counsellors in planning a program in the general course.

STUDENTS MAJORING IN:					MAJORING IN OTHER FIELDS:	
Department	**Major Field**	**Major Reqmts. 5-7 Courses Must Include:**	**Recommended Minors**	**Suggested Options**	**Minor Reqs. 3-5 Courses Must Include:**	**Suggested Options**
ASIAN STUDIES		No major Available				10, 20
BIOLOGY		Bot. 10. Zoo 10 Biol. 28a, 29b, 30b, 38	Chemistry	English Psychology Philosophy Theology Economics Fine Art	Biology 11, 34 or 35	Biology 11
CHEMISTRY		10, 22, 23, 24, 34 *2 of:* 33, 36, 332, 335	Physics Math	Philosophy Fine Art Economics Sociology Psychology Language	10, 23, 36	10
CLASSICS	Latin Greek	12, 21, 38 No major Available	History English French	Open	12, 21	Latin 12 Greek 4, 37
DRAMA & SPEECH		Drama 10; plus *2 of:* Drama 22, 28, 25, Speech 20, 24; & *2 of:* Drama 34, 38 Speech 30, 32	English Fine Art	Open	Drama 10	Drama 10, 25
ECONOMICS		19, 21, 23	Geography History Psychology Pol. Sc. Mathematics Sociology	Open	19	19, 15, 27ab
ENGLISH		15, 20, 30	Classics Fine Art History Language Philosophy Theology Sociology	Fine Art Drama History	15	15
FINE ART		10, 24	Psychology Sociology History English	Open	10	10, 23, 24, 34

STUDENTS MAJORING IN:					MAJORING IN OTHER FIELDS:	
Department	**Major Field**	**Major Reqmts. 5-7 Courses Must Include:**	**Recom-mended Minors**	**Suggested Options**	**Minor Reqs. 3-5 Courses Must Include:**	**Suggested Options**
GEOGRAPHY		10	Biology Economics History Pol. Sc.	Open	10	10
GEOLOGY		10 or 11	Chemistry Mathematics Biology Physics	Open	10 or 11	10 or 11
HISTORY		10, 25	English Economics Languages Philosophy Psychology Sociology Pol. Sc.	Open	10, 25	10, 25, 22, 27, 30, 34, 35
HOME ECONOMICS		10, 25, 27, 31, 37 and/or 30	English History Languages	Biol. 34 Fine Art	10, 27, 31	10, 25ab, 27
MATHE-MATICS	B.A.	11ab, 15, 25, 20a, 12b, 30, 32 or 37	Economics Languages Theology Home Ec.	Phil. 38 Phys. Ed. Bus. Ad. Economics	**MATH A:** 11ab, 13; at least one full course from: 12b, 20a, 29a, 32 or 37	13, 11ab
	B.Sc.	11ab, 15, 25, 20a, 27b	Physics Chemistry Biology	Phil. 38 Phys. Ed. Bus. Ad.	**MATH AB:** 11ab, 15; at least one full course from: 12b, 20a, 22, 25	
MODERN LANGUAGES	French	14, 22y, 23y, 27, 31, 37	English History Mathematics Language Theology Latin Nat. Sc.	Open	14, 22y, 23y, 27	11, 12, 13
	German	12, 22y, 23y, 21, 31, 34			12, 21, 22y, 23y	4, 12
	Russian	No major Available				4, 12
	Spanish	12 or 14, 20, 21, 30			12 or 14, 20, 21	3 or 4, 12
MUSIC		11, 21, 28, 31, 38	Open	Open	11	11, 20, 28, 38
PHILOSO-PHY		15; & *2 of:* 23, 24, 27, 31	Open	Open	Phil. 15 recom-mended	Open

STUDENTS MAJORING IN:					MAJORING IN OTHER FIELDS:	
Department	**Major Field**	**Major Reqmts. 5-7 Courses Must Include:**	**Recom-mended Minors**	**Suggested Options**	**Minor Reqs. 3-5 Courses Must Include:**	**Suggested Options**
PHYSICS		10, 22, 23, 25b, 31, 34, 36	Mathematics	Philosophy History Fine Art Music Economics Sociology Psychology Anthro-pology Language	10, 22, 23, **or** 10, 26, 36	10, 13, 29
POLITICAL SCIENCE		12, 20, 37	Economics History Philosophy Sociology	Economics History Philosophy Sociology	12	12, 20
PSYCH-OLOGY		15, 28	Mathematics Nat. Sc. English Fine Art Social Sc.	Philosophy History Theology Fine Art	15	15, 22, 26ab, 27, 31
SOCIOLOGY	Sociology	12; and at least *2 of:* 23, 24, 25, 29; and *2 of:* 31, 35, 37	Anthro. Psychology Pol. Sc. Economics	Open	Soc. 12	Soc. 12, 23, 24, 25, 27, 31
	Anthrop.	No major Available			Anthrop. 10, 28, 31 and/or 32	Anthrop. 10
THEOLOGY		18, 28	Philosophy History English Sociology Psychology Language	Open	Open	Open

THE PRELIMINARY YEAR

Admission Requirements: see page B-5.

Course Programs for Preliminary Year

(a) **Arts and Commerce**

English 5, Library Science
Language 2 or 3 or 4*
Mathematics 4ab+ or Language 2#
One of: Chemistry 1, Physics 1, Biology 11,
Home Economics 10, Geology 10
Option#

*If a student continues the language taken in high school, Language 2 satisfies this requirement.

+Students planning to enter I Year Commerce must choose Mathematics 4ab.

#Students who intend to major in Mathematics in the Arts program will take Mathematics 1 in place of Mathematics 4ab, and Mathematics 2 as the option.

This prepares for admission to First Year Arts, leading to General and Honours B.A. degrees; and to the Honours B.Comm. degree provided Mathematics has been completed. Students planning to enter Honours Psychology and Science should take Preliminary Year Science (see below).

A student in Preliminary Year who has obtained standing in a First Year subject in his major field is allowed to fulfill the major requirements for the Arts course by either (a) completing five additional courses in his major field, or (b) completing four additional courses in his major field, plus one option.

(b) **Science**

English 5, Library Science, Mathematics 1 and 2, Chemistry 1, Physics 1, Option.

For admission to I Year Science, a student must have an overall average of 60%, and an average of 60% in Mathematics, Physics and Chemistry.

This prepares for admission to First Year Arts, Science, Commerce and Engineering.

(c) **Nursing**

English 5, Mathematics 1 and 2, Chemistry 1, Biology 11; Physics 1 or option; Library Science.

N.B.: Students of the Preliminary Year who successfully complete Library Science are not required to repeat this subject in First Year.

BACHELOR OF ARTS

GENERAL COURSE

Admission requirements: Grade 13 English; Language or Mathematics A; and at least three other credits. (Mathematics at the Grade 11 or 12 level is normally required, and Language of Grades 11 and 12 is required); OR "Preliminary Year". A student wishing to major in Mathematics must have Mathematics A and B; a student wishing to major in Music must have Grade VIII Practical and Grade II Theory, or consent of the Department.

First Year

Six courses from at least three groups as shown on the "Course Chart" (p. C-16), including:

At least 1 from group A
At least 1 from group B
At least 1 from group C or D

Second Year

Five courses from at least two groups.

Third Year

Five courses from at least two groups.

Every program must include a **major** of at least five courses and not more than seven in one subject; a **minor** of at least three courses and not more than five in one subject; and **electives** to a total of sixteen courses, provided that not more than twelve courses are taken from one group. For specific major and minor requirements for the various departments, see "Details of Subjects" (p. C-59 ff.) or "Guidance Chart" (p. C-19). For other regulations governing choice of courses, see "Curriculum Requirements" (p. C-17).

HONOURS DRAMA AND ENGLISH

Admission requirements: Grade 13 English; Language or Mathematics A; and at least 3 other credits; OR equivalent "Preliminary Year".

First Year

Drama 10; English 15; Philosophy 15; Language 12; one course from Group B or D; one option; Library Science.

For admission to Second Year Honours, an overall average of 60% is required, with 66% in Drama 10 and 66% in English 15.

Second Year Honours

Drama 222, 228; English 235, 236, 350; Speech 220.

Third Year Honours

Drama 335, 338; English 350, 363; Speech 330, 424; History 25 or option.

Fourth Year Honours

Drama 434, 445; English 356, 459, 460; Speech 432.

HONOURS DRAMA AND SPEECH

Admission requirements: Grade 13 English; Language or Mathematics A; and at least 3 other credits; OR equivalent "Preliminary Year".

First Year

Drama 10; English 15; Philosophy 15; Language 12; one course from Group B or D; one option; Library Science.

For admission to Second Year Honours, an overall average of 60% is required, with 66% in Drama 10.

Second Year Honours

Drama 222; Speech 220; English 235; Philosophy 32; Psychology 15; one option.

Third Year Honours

Drama 228, 335; Speech 330; English 356; Psychology 31; one option.

Fourth Year Honours

Drama 338, 434, 445; Speech 424, 432; English 236.

HONOURS ECONOMICS

Admission requirements: Grade 13 English, Mathematics AB, and at least two other credits; OR "Preliminary Year". This course prepares the student to proceed to a Type A Certificate in Economics at the Ontario Colleges of Education.

First Year

Economics 19*; Political Science 12; Mathematics 13 or Language 12 or Science**; one course from Group A; one option; Library Science.

For admission to Second Year Honours, an overall average of 60% is required, and at least 66% in Economics 19.

Second Year Honours

Economics 221, 223, 224, 227ab; Mathematics 11a and 12b, or option**; Political Science 220 or Business Administration 250.

Third Year Honours

Economics 338; *three of:* Economics 301, 331, 335, 336; Mathematics 37 or option**; one option.

Fourth Year Honours

Economics 400, 406, 410; *two of:* Economics 401, 402, 404, 432, or any Third Year course in Economics not previously taken; one option.

HONOURS ECONOMICS AND HISTORY

Admission requirements: Grade 13 English; Language or Mathematics A; and at least 3 other credits; OR "Preliminary Year". This program includes sufficient credits to satisfy the requirements for admission to courses leading to the Type A Certificate in Economics or History at the Ontario Colleges of Education.

First Year

Economics 19*; History 10; Political Science 12; Mathematics 13 or Language 12 or Science; two options; Library Science.

For admission to Second Year Honours, an overall average of at least 60% is required, with at least 66% in each of Economics 19 and History 10.

Second Year Honours

Economics 221, 223, 224 or option, 227ab; History 225; History 222 or 257.

Third Year Honours

Two of: Economics 301, 331, 335, 336, 338; *three of:* History 330 or 332, 324, 333, 334, 335, 337, 340, 353; one option.

Fourth Year Honours

Economics 400; *one of:* Economics 401, 402, 406, 432; *three of:* History 425, 438, 439, 452, 455, 458, 461; one option.

*Students who have taken Economics 15 may be accepted into Second Year Honours with permission of the Head of the Department.

**Option other than Mathematics may be selected only with the permission of the Head of the Department.

HONOURS ECONOMICS AND POLITICAL SCIENCE

Admission requirements: Grade 13 English; Language or Mathematics A; and at least 3 other credits; OR equivalent "Preliminary Year".

By the proper choice of subjects, a student completing the following program with second class honours, may qualify for admission to courses leading to Type A Certificates in Economics and Political Science, in Economics, or in Political Science, at the Ontario Colleges of Education.

First Year

Economics 19*; Political Science 12; Mathematics 13 or Language 12 or Science**; one course from Group A; two options; Library Science.

For admission to Second Year Honours, an overall average of 60% is required, with at least 66% in Economics 19 or Economics 15*.

Second Year Honours

Economics 224 or Political Science 234; Economics 221, 223; Political Science 220, 223; History 225 or Economics 227ab.

Third Year Honours

Economics 338; Political Science 337; *four of:* Economics 301, 331, 335, 336, Political Science 221, 330, 332, 334, 336, 343, or any Fourth Year course in Economics or Political Science selected in consultation with the Department.

Fourth Year Honours

Economics 400; Political Science 452; *three of:* Economics 401, 402, 404, 406, 410, 432, Political Science 435, 440, 460, 461, or any Third Year course in Economics or Political Science not previously taken.

HONOURS ECONOMICS AND SOCIOLOGY

Admission requirements: Grade 13 English; Language or Mathematics A; and at least 3 other credits; OR "Preliminary Year".

By the proper choice of subjects, a student completing the following program with second class honours may qualify for admission to courses leading to the Type A Certificate in Economics at the Ontario Colleges of Education.

First Year

Economics 19*; Sociology 12; Mathematics 13 or Language 12 or Science**; Anthropology 10; one course from Group A; one option; Library Science.

For admission to Second Year Honours, an overall average of 60% is required, with 66% in each of Economics 19 and Sociology 12.

Second Year Honours

Economics 221, 223, 224, 227ab; Sociology 229; Anthropology 228 or Sociology 224.

Third Year Honours

Economics 338; *two of:* Economics 301, 331, 335, 336; Sociology 331, 335, 337.

Fourth Year Honours

Economics 400; *two of:* Economics 401, 402, 404, 406, 410, 432; Sociology 400, 410; one option.

*Students who have taken Economics 15 may be accepted into Second Year Honours with permission of the Head of the Department.

**Students who intend to emphasize Economics in their program are advised to select Mathematics 13.

HONOURS ENGLISH LANGUAGE AND LITERATURE

Admission requirements: Grade 13 English; Language or Mathematics A; and at least 3 other credits (Latin is recommended); OR equivalent Preliminary Year.

This program is accepted by the Ontario Department of Education as academic qualification for admission to High School Assistant's Certificate, Type A, English.

First Year

English 15; History 24; one course from Group B; one course from Group C or D; two options; Library Science.

For admission to Second Year Honours, an overall average of at least 60% is required, with at least 66% in English 15, and History.

Second Year Honours

English 200y; three English Honours courses, to be chosen from Groups I-VII*; two options#.

Third Year Honours

Three English Honours courses, to be chosen from Groups I-VII*; option# (may be a course from Groups I-VIII*); another option#.

Fourth Year Honours

English 499y; three English courses to be chosen from Groups I-VII*; option# (may be a course from Groups I-VIII*); another option#.

HONOURS ENGLISH AND FRENCH

Admission requirements: Grade 13 English; French; and at least 3 other credits (Latin is recommended); OR equivalent "Preliminary Year".

This program is accepted by the Ontario Department of Education as academic qualification for admission to High School Assistant's Certificate, Type A, English and French.

First Year

English 15; French 14; Latin 12 or another language; one course from Group B; two options; Library Science.

For admission to Second Year Honours, an overall average of at least 60% is required, and at least 66% in each of English and French.

Second Year Honours†

English 235, 250; *one of:* English 236, 260, 270; French 260y, 261y, 270; one option.

Third Year Honours†

English 350, 363; French 375y, 376b, 378a, 380; History 25; one option.

Fourth Year Honours†

English 450, 460, 463; French 490, 495, 496y.

*See page C-77 for English Groups.

#See "Details of Subjects", English Department (page C-76) for advice about preferred options and sequences for English majors.

†With the permission of the English Department, a student may substitute **English** courses other than those specified.

HONOURS ENGLISH AND HISTORY

Admission requirements: Grade 13 English; Language or Mathematics A; and at least three other credits (Latin is recommended); OR equivalent "Preliminary Year".

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, English and History.

First Year

English 15; History 10; one course from Group B; one course from Group C or D; two options; Library Science.

For admission to Second Year Honours, an overall average of at least 60% is required, and 66% in each of English, and History.

Second Year Honours†

English 235, 250; *one of:* English 236, 260, 270; History 225, 257; one option.

Third Year Honours†

English 350, 363; History 324; *one of:* History 222, 330, 332; *one of:* History 333, 334, 335, 337; Political Science 12 or Geography 10.

Fourth Year Honours†

Three of: English 450, 459, 460, 463; *three of:* History 425, 438, 439, 452, 458, 461.

HONOURS ENGLISH AND LATIN

Admission requirements: Grade 13 English; Latin; and at least three other credits; OR equivalent "Preliminary Year".

By the proper choice of subjects, a student completing the following program with second class honours, may qualify for admission to courses leading to the Type A Certificate in English and Latin at the Ontario Colleges of Education.

First Year

English 15; Latin 12; French 12 or another language; one course from Group B; two options; Library Science.

For admission to Second Year Honours, an overall average of at least 60% is required, and 66% in each of English 15 and Latin 12.

Second Year Honours†

English 235, 250; *one of:* English 236, 260, 270; Latin 222, 225; Theology or option.

Third Year Honours†

English 350, 363; Latin 338; *one of:* Latin 332, 333; History 27; one option.

Fourth Year Honours†

English 450, 460, 463; Latin 450, 451, 463y.

†With the permission of the English Department, a student may substitute **English** courses other than those specified.

HONOURS ENGLISH AND PHILOSOPHY (Language Option)

Admission requirements: Grade 13 English; French or Latin; and at least three other credits; OR equivalent "Preliminary Year".

This program is accepted by the Ontario Department of Education as academic qualification for admission to High School Assistant's Certificate, Type A, English.

First Year

English 15; Philosophy 15; French 12 or Latin 12; Psychology 15; two options; Library Science.

For admission to Second Year Honours, an overall average of at least 60% is required, and 66% in each of English 15, Language 12 and Philosophy 15.

Second Year Honours†

Philosophy 224; English 235, 250; Theology or Philosophy 22 or option; and **either:** French 260y, 261y, 270; **Or:** Latin 222, 225.

Third Year Honours†

English 350, 363; *one of:* English 337, 338, 340, 356; Philosophy 334, 336; *one of:* French 380, Latin 332.

Fourth Year Honours†

Four of: English 450, 459, 460, 463, 480, 499y; Philosophy 333a, 431; *one of:* French 490, 495, Latin 450.

HONOURS ENGLISH AND SPANISH

Admission requirements: Grade 13 English; Language or Mathematics A; and at least three other credits (Latin is recommended); OR equivalent "Preliminary Year".

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, English and Spanish.

First Year

English 15; Spanish 4 or 14; Latin 12 or another language; one course from Group B or D; two options; Library Science.

For admission to Second Year Honours, an overall average of at least 60% is required, and at least 66% in each of English 15 and Spanish.

Second Year Honours†

English 235, 250; *one of:* English 236, 260, 270; Spanish 220 or 14; Spanish 221; two options.

Third Year Honours†

Spanish 220* or option; English 363, 350; *one of:* English 337, 338, 340, 356; Spanish 322y, 330, 331; option.

Fourth Year Honours†

English 450, 460, 463; Spanish 490, 495, 496y.

*Required if not previously taken.

†With the permission of the English Department, a student may substitute **English** courses other than those specified.

HONOURS FRENCH AND LATIN

Admission requirements: Grade 13 English; French; Latin; and at least one other credit; OR equivalent "Preliminary Year".

By the proper choice of subjects, a student completing the following program with second class honours, may qualify for admission to courses leading to the Type A Certificate in French and Latin at the Ontario Colleges of Education.

First Year

French 14; Latin 12; one course from Group A; one course from Group B or D; two options; Library Science.

For admission to Second Year Honours, an overall average of at least 60% is required, and at least 66% in each of French 14 and Latin 12.

Second Year Honours

French 260y, 261y, 270; Latin 222, 225; History 27; Theology or option.

Third Year Honours

One of: Philosophy 25, 26, 32; French 375y, 376b, 378a, 380; Latin 338; *one of:* Latin 332, 333; one option.

Fourth Year Honours

History 25; French 490, 495, 496y; Latin 450, 451, 463y.

HONOURS FRENCH AND SPANISH

Admission requirements: Grade 13 English; French; and at least three other credits (Latin is recommended); OR equivalent "Preliminary Year".

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, French and Spanish.

First Year

French 14; Spanish 4 or 12; one course from Group A; one course from Group B or D; two options; Library Science.

For admission to Second Year Honours, an overall average of at least 60% is required, and at least 66% in each of French and Spanish.

Second Year Honours

French 260y, 261y, 270; Spanish 220 or 14; Spanish 221; two options.

Third Year Honours

French 375y, 376b, 378a, 380; Spanish 322y, 330, 331; Spanish 221* or option; *one of:* Philosophy 25, 26, 32.

Fourth Year Honours

French 490, 495, 496y; Spanish 490, 495, 496y; option.

*Required, if not previously taken.

HONOURS GEOGRAPHY

Admission requirements: Grade 13 English; Language or Mathematics A; at least three other credits; OR equivalent "Preliminary Year".

By the proper choice of subjects, a student completing the following program with second class honours, may qualify for admission to courses leading to the Type A Certificate in Geography, at the Ontario Colleges of Education.

First Year

Geography 10; one course from Group A; one course from Group B or C; three options; Library Science.

For admission to Second Year Honours, an overall average of 60% is required, and at least 66% in Geography 10.

Second Year Honours

Geography 223, 224, 225; Philosophy 22 or option; *one of:* Economics 19, Political Science 12, or option; History 222.

Third Year Honours

Three of: Geography 332, 334, 335, 336, 337; *one of:* History 225, 324, 334; two options*.

Fourth Year Honours

Three of: Geography 433, 444, 446, 447; three options*.

*All options are to be selected in consultation with the Department. At least one option in III Year and two in IV Year must be at the honours level.

HONOURS HISTORY (Economics Option)

Admission requirements: Grade 13 English; Language or Mathematics A; and at least three other credits; OR equivalent "Preliminary Year".

This program is endorsed by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, History.

First Year

History 10; Economics 19#; Political Science 12 or option; one course from Group C or D; two options; Library Science.

For admission to Second Year Honours, an overall average of at least 60% is required, with at least 66% in each of History 10 and Economics 19.

Second Year Honours

History 225, 227; Economics 223; Geography 10, 223; *one of:* Philosophy 25, 26, 30, or 39.

Third Year Honours

Three of: History 330 or 332, 324, 333, 334, 335, 337; Economics 338; Theology or Philosophy 22; Geography 224.

Fourth Year Honours

Three of: History 425, 438, 439, 452, 458, 461; *one of:* Economics 400, Political Science 452; *one of:* Economics 402, Economics 432, Political Science 332, Political Science 334; Geography 334.

#Students who have taken Economics 15 may be accepted into Second Year Honours at the discretion of the Department.

HONOURS HISTORY (Philosophy Option)

Admission requirements: Grade 13 English; Language or Mathematics A; and at least three other credits; OR equivalent "Preliminary Year".

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, History.

First Year

History 10; Philosophy 15; Psychology 15 or option; one course from Group C or D; two options; Library Science.

For admission to Second Year Honours, an overall average of at least 60% is required, with at least 66% in each of Philosophy 15 and History 10.

Second Year Honours

History 225, 227; Philosophy 224, 439; Philosophy 26 or 30; Geography 10.

Third Year Honours

Three of: History 330 or 332, 324, 333, 334, 335, 337; Philosophy 334; Geography 224; one option.

Fourth Year Honours

Three of: History 425, 438, 439, 452, 455, 458, 461; Philosophy 431; Theology or Philosophy 22 or option; Political Science 12.

HONOURS HISTORY AND THEOLOGY

Admission requirements: Grade 13 English; Language or Mathematics A; and at least three other credits; OR equivalent "Preliminary Year".

By the proper choice of subjects, a student completing the following program with second class honours, may qualify for admission to courses leading to the Type A Certificate in History at the Ontario Colleges of Education.

First Year

History 10; Theology 18; one course from Group B; one course from Group C or D; two options; Library Science.

For admission to Second Year Honours, an overall average of 60% is required, and at least 66% in each of History 10 and Theology.

Second Year Honours

History 225; *one of:* History 222, 257; *two of:* Theology 220, 222, 224, 228; two options.

Third Year Honours

Three of: History 330 or 332, 324, 333, 334, 335, 337; *two of:* Theology 324, 330, 331, 334; one option.

Fourth Year Honours

Three of: History 425, 438, 439, 458, 461; *two of:* Theology 435, 438, 441, or any Theology in the 200's or 300's not previously taken.

HONOURS INTERNATIONAL RELATIONS

Admission requirements: Grade 13 English; Language or Mathematics A; and at least three other credits; OR equivalent "Preliminary Year".

This program includes sufficient credits to satisfy the requirements for admission to courses leading to the Type A Certificate in Political Science and Economics at the Ontario Colleges of Education.

First Year

Political Science 12; Economics 19*; one course from Group A; one course from Group C or D; two options; Library Science.

For admission to Second Year Honours, an overall average of 60% is required, and at least 66% in each of Political Science 12 and Economics 19*.

Second Year Honours

Political Science 220, 223; Economics 223, 227; History 225; *one of:* Language (second year course), Geography 23, Anthropology 28, Economics 24, Sociology 24, or option.

Third Year Honours

Geography 433; Political Science 343; Economics 301; History 425; *one of:* History 333, 334, 337; *one of:* Language (third year course), Economics 31, Economics 36, Sociology 31, or option.

Fourth Year Honours

Political Science 460, 461; History 38 or any other general course in History not previously taken; plus one of the following groups:

Group 1. History 439; Political Science 332; Economics 432.

Group 2. History 461; Political Science 221; *and one of:* Economics 401, 406.

Group 3. Anthropology 331; Political Science 334 or 440; Economics 402.

*Students who have taken Economics 15 may be accepted into Second Year Honours with the permission of the Head of the Department of Economics.

N.B.: Students who intend to select Group 1 in the Fourth Year should take Russian in the First and Second Years and History 337 in Third; those who intend to select Group 2 should take History 334 in the Third Year and those who intend to select Group 3 should take History 333 in Third Year.

HONOURS MATHEMATICS (ARTS)

Admission requirements: Grade 13 English; Mathematics AB; Physics; and at least one other credit; OR equivalent "Preliminary Year".

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, Mathematics.

First Year

Mathematics 11ab, 15; one course from Group A; one course from Group B; two options; Library Science.

For admission to Second Year Honours, the student must obtain an average of 66% in Mathematics 11 and 15, and an overall average of 60%.

Second Year Honours

Mathematics 20a, 35b, 227, 229, 254ab; two options.

Third Year Honours

Mathematics 20a/35b*, 300, 337, 338a, 399y; one option; and **either:** Pure Mathematics Option – Mathematics 342b, 354b; **or:** Statistics Option – Mathematics 330.

Fourth Year Honours

Mathematics 337 (if not previously taken) or option; Mathematics 499; an option in the humanities; and **either:** Pure Mathematics Option – three full courses from: Mathematics 355b, 400, 429b, 431ab, 435ab, 444, 448, 449ab; **or:** Statistics Option – Mathematics 400, 431, 444.

(Among the options, a sequence of at least three subjects must be chosen in order to constitute a minor.)

*Mathematics 435 will replace Mathematics 20a/35b in 1968-9.

HONOURS PHILOSOPHY

Admission requirements: Grade 13 English; Language or Mathematics A; and at least three other credits; OR equivalent "Preliminary Year".

First Year

Philosophy 15; Language 4 or 12; one course from Group C or D; three options; Library Science.

For admission to Second Year Honours, an overall average of at least 60% is required, and at least 66% in Philosophy 15.

Second Year Honours

Philosophy 221, 224, 228; Language 12; Theology or option*; one option*.

Third Year Honours

Philosophy 323, 327, 334, 336; two options*.

Fourth Year Honours

Philosophy 431, 435, 462; one other Philosophy numbered in the 400's or higher; two options*.

HONOURS PHILOSOPHY AND LATIN (English or French Option)

Admission requirements: Grade 13 English; French; Latin; and at least one other credit; OR equivalent "Preliminary Year".

First Year

Philosophy 15; Latin 12; History 27 or option; English 15 or French 12; one course from Group B or D; one option; Library Science.

For admission to Second Year Honours, an overall average of at least 60% is required, and at least 66% in each of Philosophy 15, Latin 12, and English 15 or French 12.

Second Year Honours

Philosophy 224, 228; Latin 222, 225; *one of:* French 270, English 235; Theology or option.

Third Year Honours

Philosophy 327, 334; Latin 338; *one of:* Latin 332, 333; *one of:* French 380, English 350.

Fourth Year Honours

Philosophy 431, 439, 462; Latin 450, 451; *one of:* French 490, English 460.

*Options must not be taken at random, but in sequence and with the approval of the Department of Philosophy.

HONOURS PHILOSOPHY AND MATHEMATICS

Admission requirements: Grade 13 English; Mathematics AB; and at least two other credits; OR equivalent "Preliminary Year".

By the proper choice of subjects, a student completing the following program with second class honours, may qualify for admission to courses leading to the Type A Certificate in Mathematics at the Ontario Colleges of Education.

First Year

Philosophy 15; Mathematics 11ab, 15; one course from group B or C; two options; Library Science.

For admission to Second Year Honours, an overall average of 60% is required, and 66% in each of Philosophy 15, Mathematics 11ab and Mathematics 15.

Second Year Honours

Mathematics 227, 229, 254ab; Philosophy 228; *one of:* Philosophy 224, 327.

Third Year Honours

Mathematics 300, 338a, 354b, 355b, 399; Philosophy 334, 438.

Fourth Year Honours

Mathematics 499; two other courses in Mathematics numbered in the 400's or higher; Philosophy 411, 431; one other course in Philosophy numbered in the 400's.

HONOURS PHILOSOPHY AND PSYCHOLOGY

Admission requirements: Grade 13 English; Language or Mathematics A (Mathematics A is recommended); and at least three other credits; OR equivalent "Preliminary Year".

By the proper choice of subjects, a student completing the following program with second class honours, may qualify for admission to courses leading to the Type A Certificate in Mathematics at the Ontario Colleges of Education.

First Year

Philosophy 15; Psychology 15; one course from Group C or D; three options; Library Science.

For admission to Second Year Honours, an overall average of 60% is required, and 66% in each of Philosophy 15, and Psychology 15.

Second Year Honours

Philosophy 224, 228; Psychology 228, 231; two options.

Third Year Honours

Philosophy 334, 336; Psychology 230, 334; Political Science 12; option.

Fourth Year Honours

Philosophy 333a, 333b, 431; *two of:* Psychology 327, 353, 429, 455; two options.

HONOURS POLITICAL SCIENCE

Admission requirements: Grade 13 English; Language or Mathematics A; and at least three other credits; OR equivalent "Preliminary Year".

First Year

Political Science 12; Economics 19; Sociology 12 or Psychology 15; one course from Group A; one course from Group C or D; one option; Library Science.

For admission to Second Year Honours, an overall average of 60% is required, with at least 66% in Political Science 12.

Second Year Honours

Political Science 220; Sociology 224 or Political Science 234 (if not previously chosen); Economics 221 or 223; one other second year honours course in Political Science; History 225; one option.

Third Year Honours

Political Science 337; History 330; Psychology 334 or option; two additional Political Science courses from those offered in Third and Fourth years; *one of:* Economics 224, 301, Geography 433, Sociology 335, 337, or a Third Year History course not previously taken.

Fourth Year Honours

Political Science 452; two additional Political Science courses from those offered in Third and Fourth Years; *three of:* Economics 400, 402, Anthropology 331, a Fourth Year History course not previously taken, or option.

HONOURS POLITICAL SCIENCE AND HISTORY

Admission requirements: Grade 13 English; Language or Mathematics A; and at least three other credits; OR equivalent "Preliminary Year".

This program includes sufficient credits to satisfy the requirements for admission to courses leading to the Type A Certificate in History or Political Science at the Ontario Colleges of Education.

First Year

History 10; Political Science 12; Economics 19; one course from Group C or D; two options; Library Science.

For admission to Second Year Honours, an overall average of 60% is required, with at least 66% in each of Political Science 12 and History 10.

Second Year Honours

Political Science 220, 223; History 222, 225; Theology, Philosophy 22 or option; one option.

Third Year Honours

Political Science 337; *three of:* History 324, 330 or 332, 333, 334, 335, 337; *one of:* Political Science 221, 334, 336, 343; one option.

Fourth Year Honours

Political Science 452; *two of:* Political Science 332, 435, 460, 461; *three of:* History 425, 438, 439, 452, 455, 458, 461.

HONOURS POLITICAL SCIENCE AND SOCIOLOGY

Admission requirements: Grade 13 English; Language or Mathematics A; and at least three other credits; OR equivalent "Preliminary Year".

By the proper choice of subjects, a student completing the following program with second class honours may qualify for admission to courses leading to the Type A Certificate in Political Science at the Ontario Colleges of Education.

First Year

Political Science 12; Sociology 12; one course from Group A; one course from Group C or D; two options; Library Science.

For admission to Second Year Honours an overall average of at least 60% is required, and 66% in each of Political Science 12 and Sociology 12.

Second Year Honours

Political Science 220, 223; Sociology 229; *one of:* Sociology 224, 225; Anthropology 228; Economics 19.

Third Year Honours

Political Science 334; *either* Economics 224 *or* Political Science 336; Sociology 331, 335, 337; one option.

Fourth Year Honours

Political Science 435, 343, 452; Sociology 400, 410; Economics 400.

HONOURS PSYCHOLOGY

Admission requirements: Grade 13 English; Language or Mathematics A (Mathematics A is recommended); and at least three other credits; OR equivalent "Preliminary Year".

By the proper choice of subjects, a student completing the following program with second class honours may qualify for admission to courses leading to the Type A Certificate in Psychology and Sociology at the Ontario Colleges of Education.

First Year

Psychology 15; one course from Group A; one course from Group C or D; three options; Library Science.

For admission to Second Year Honours, an overall average of at least 66% is required, and 66% in Psychology 15.

Second Year Honours

Psychology 228, 230; *two of:* Psychology 222, 225, 334, cognate field option; two options.

Third Year Honours

Psychology 353; *three of:* Psychology 222, 225, 231, 320, 327, 333, 334, 353, cognate field option; two options.

Fourth Year Honours

Psychology 451; *three of:* Psychology 231, 320, 327, 333, 353, 410, 429, 450, 454, 455, cognate field option; one option.

NOTE: 1. The three main areas of psychology represented by the Honours program are Experimental Psychology, Social-Personality Psychology, and Clinical Psychology. Four courses are common requirements for all of these areas, viz.: Psychology 228, 230, 353 and 451. Specific requirements for each of the three areas may be had from the Department.

2. In each of the Second and Third Years there are two free options available, and one in Fourth Year. These options should be selected to fit the plans of the individual student.

3. An outside option in a cognate field may be selected in place of one Honours Psychology option in any or all of Second, Third or Fourth Years, with permission of the Department. The outside option may be in:

   (a) Natural Science (physics, chemistry, biology)
   (b) Social Science (sociology, anthropology, economics, political science)
   (c) Mathematics
   (d) Philosophy
   (e) Other cognate fields which may fit into the particular student's requirements.

4. It is recommended that students entering any Honours Psychology program have Ontario Grade 13 Mathematics A, or equivalent.

HONOURS PSYCHOLOGY AND SCIENCE

Admission requirements: Grade 13 English; Mathematics AB; Physics; and at least one other credit; OR equivalent "Preliminary Year".

By the proper choice of subjects, a student completing the following program with second class honours, may qualify for admission to courses leading to the Type A Certificate in Psychology and Sociology at the Ontario Colleges of Education.

First Year

Psychology 15; Physics 10; Mathematics 11ab, 15; one course from Group A; one option; Library Science.

For admission to Second Year Honours, the student must obtain at least 66% in each of Psychology, Mathematics and Physics of First Year, and an overall average of at least 66%.

Second Year Honours

Psychology 228, 231; Mathematics 25; Physics 222; Biology 11; one full course from: Philosophy 35a, Sociology 12, option.

Third Year Honours

Psychology 230, 334; Mathematics 35b, 27b; Physics 223; two full courses from: Theology, Mathematics 229, Philosophy 33ab, Anthropology 10, Zoology 10, option.

Fourth Year Honours

Psychology 333, 353, 451; Mathematics 37; Physics 334, 370/1; Biology 29b; one full course from: Mathematics option, Philosophy 36ab, Sociology 25ab, Zoology 22, option.

HONOURS PSYCHOLOGY AND SOCIOLOGY

Admission requirements: Grade 13 English; Language or Mathematics A (Mathematics A is recommended) and at least three other credits; OR equivalent "Preliminary Year".

This program includes sufficient credits to satisfy the requirements for admission to courses leading to the Type A Certificate in Psychology and Sociology at the Ontario Colleges of Education.

First Year

Psychology 15; Sociology 12; Anthropology 10; one course from Group A; one course from Group C or D; one option; Library Science.

For admission to Second Year Honours, an overall average of 66% is required, and 66% in each of Sociology 12 and Psychology 15.

Second Year Honours

Anthropology 10; Psychology 222, 228, 231; *either* Sociology 224 *or* 225; one option.

Third Year Honours

Psychology 334, 353; Sociology 331, 335, 337; one option.

Fourth Year Honours

Psychology 429, 454; Sociology 400, 410; one option.

HONOURS SOCIOLOGY AND ANTHROPOLOGY

Admission requirements: Grade 13 English; Language or Mathematics A, and at least three other credits; OR equivalent "Preliminary Year".

This program includes sufficient credits to satisfy the requirements for admission to courses leading to the Type A Certificate in Psychology and Sociology at the Ontario Colleges of Education.

First Year

Sociology 12; Anthropology 10; one course from Group A; one course from Group C or D; two options; Library Science.

For admission to Second Year Honours, an overall average of 60% is required, and 66% in each of Sociology 12 and Anthropology 10.

Second Year Honours

Sociology 224, 225, 229; Anthropology 228; Psychology 15; one option.

Third Year Honours

Sociology 331, 335, 337; Anthropology 331; two options.

Fourth Year Honours

Sociology 400, 410; Psychology 334, 454; one option.

HONOURS THEOLOGY AND PHILOSOPHY

Admission requirements: Grade 13 English; Language or Mathematics A; and at least three other credits; OR equivalent "Preliminary Year".

First Year

Theology 18; Philosophy 15; one course from Group B; one course from Group C or D; two options; Library Science.

For admission to Second Year Honours, an overall average of at least 60% is required, and 66% in each of Theology 18 and Philosophy 15.

Second Year Honours

Two of: Theology 220, 222, 224, 228; Philosophy 224, 228; two options.

Third Year Honours

Two of: Theology 324, 330, 331, 334; Philosophy 327, 334; two options.

Fourth Year Honours

Two of: Theology 435, 438, 441, or any Theology in the 200's or 300's not previously taken; Philosophy 336, 431; one option.

HONOURS THEOLOGY AND PSYCHOLOGY

Admission requirements: Grade 13 English; Language or Mathematics A (Mathematics A is recommended); and at least three other credits; OR equivalent "Preliminary Year".

By the proper choice of subjects, a student completing the following program with second class honours may qualify for admission to courses leading to the Type A Certificate in Psychology and Sociology at the Ontario Colleges of Education.

First Year

Theology 18; Psychology 15; one course from Group C or D; three options; Library Science.

For admission to Second Year Honours, an overall average of at least 66% is required, and 66% in each of Theology 18 and Psychology 15.

Second Year Honours

Two of: Theology 220, 222, 224, 228; Psychology 222, 231; two options.

Third Year Honours

Two of: Theology 324, 330, 331, 334; Psychology 332, 334; two options.

Fourth Year Honours

Two of: Theology 435, 438, 442, or any Theology numbered in the 200's or 300's not previously taken; *two of:* Psychology 429, 450, 455; one option.

HONOURS THEOLOGY AND SOCIOLOGY

Admission requirements: Grade 13 English; Language or Mathematics A; and at least three other credits; OR equivalent "Preliminary Year".

By the proper choice of subjects, a student completing the following program with second class honours may qualify for admission to courses leading to the Type A Certificate in Psychology and Sociology at the Ontario Colleges of Education.

First Year

Theology 18; Sociology 12; one course from Group C or D; three options; Library Science.

For admission to Second Year Honours, an overall average of at least 60% is required, and 66% in each of Theology 18 and Sociology 12.

Second Year Honours

Two of: Theology 220, 222, 224, 228; *one of:* Sociology 224, 225; Sociology 229; two options.

Third Year Honours

Two of: Theology 324, 330, 331, 334; Sociology 331; *one of:* Sociology 335, 337; two options.

Fourth Year Honours

Two of: Theology 435, 438, 441, or any Theology in the 200's or 300's not previously taken; Sociology 400, 410; one option.

BACHELOR OF FINE ARTS

Admission requirements: Grade 13 English; Language or Mathematics A; and at least three other credits; OR equivalent "Preliminary Year".

First Year

Fine Art 10, 23; Psychology 15; one course from Group C or D; two options; Library Science.

For admission to Second Year Honours, an overall average of 60% is required, and 66% in each of Fine Art 10 and 23.

Second Year Honours

Fine Art 220, 224, 230, 233; Sociology 12; option.

Third Year Honours

Fine Art 332, 334; *either* Fine Art 330 *or* 333; Philosophy 32; option.

Fourth Year Honours

Fine Art 434, 436y, 437y; option; thesis and practical work in one of: Fine Art 440, 441, 442.

BACHELOR OF MUSIC

Admission requirements: Grade 13 English; Language or Mathematics A; Grade VIII Practical and Grade II Theory in Music, or equivalent; and any other two credits; **OR** equivalent "Preliminary Year".

A student who does not have Music as an option may be admitted to the program with the consent of the Department.

PROGRAM I: HISTORY AND THEORY

The History and Theory course leading to the Bachelor of Music degree is designed for students who wish to prepare for a general career in music in such areas as university teaching, research or composition.

First Year

Music 10, 11, 12y, 18; Language 12; one course from Group B or D; one option; Library Science.

For admission to Second Year Honours, an overall average of 60% is required, and 66% in each of Music 11, 12y, and 18.

Second Year Honours

Music 200, 221, 222y, 223y, 228, 229y; Language; Theology or option; one option.

Third Year Honours

Music 300, 333y, 334y, 336, 338, 350; Language; one option.

Fourth Year Honours

Music 305y, 331, 400, 443y, 444y, 450; Ensemble; Language; one option.

PROGRAM II: SCHOOL MUSIC

The Music Education course leading to the Bachelor of Music degree is designed to prepare students for a music teaching career in secondary schools.

First Year

Music 10, 11, 12y, 18; Language 12 or option; one course from Group B or D; one option; Library Science.

For admission to Second Year Honours, an overall average of 60% is required, and 66% in each of Music 11, 12y, and 18.

Second Year Honours

Music 200, 201y, 202y, 203y, 221, 222y, 223y, 228; Ensemble; Theology or option; one option.

Third Year Honours

Music 300, 301y, 302y, 303, 304, 305y, 331, 333y, 335y, 338; one option.

Fourth Year Honours

Music 400, 402y, 403, 404, 406y, 443y, 445y, 447; Ensemble; one option.

BACHELOR OF SCIENCE

GENERAL COURSE

Admission requirements: For major in Chemistry, Geology, Mathematics, Physics — Grade 13 English, Mathematics AB, Chemistry, Physics; for major in Biology, pre-medicine, pre-dentistry, pre-pharmacy, pre-optometry, pre-medical technology — Grade 13 English, Mathematics A, Chemistry, Physics, and at least one other credit (Mathematics B or Biology is recommended); OR "Preliminary Year Science". An average of 60% is required in Mathematics and Science.

FIRST YEAR

One course from group A
One course from group B or C

And one of the following combinations:

Biology, Pre-medicine — Botany 10, Chemistry 10, Physics 13, Zoology 10.

Geology — Geology 10 or 11; Chemistry 10; *two of:* Botany 10, Math 11ab, Math 15, Physics 10, Zoology 10.

Chemistry, Mathematics, Physics — Chemistry 10, Math 11ab, Math 15, Physics 10.

SECOND YEAR

One of the following combinations:

Biology* — Biology 28a, 29b; Chemistry 23, 24y; 1½ options; AND
(a) Botany elective: Botany 22ab.
(b) Microbiology elective: Microbiology 26ab.
(c) Pre-medicine: Zoology 22.
(d) Zoology elective: Zoology 22.

Chemistry — Chemistry 22, 23, 24; Physics 26; one course from group A, B or C.

Geology — Two Geology courses in the 20's or 30's; one course from group A, B or C; three options, at least one from Botany 34, Chemistry 22, Chemistry 24, Math 22, Math 25, Math 31a, Physics 23, Physics 25b, Physics 26, Zoology 37, or any option not chosen in I Year.

Mathematics — Math 12b, 20a, 25; Physics 26; two options (at least one from group A, B or C).

Physics — Physics 22, 23, 25b; Math 25; 1½ options (at least one from group A, B or C).

*Mathematics 20a or 29a is recommended as a half-course option in II Year of the Biology major. The other option is to be chosen from group A, B or C.

THIRD YEAR

One of the following combinations:

Biology — Biology 30b, 38c, Chemistry 36; one option from group A, B or C; AND
(a) Botany elective: Biology 37a, Botany 30b; *either* Botany 34 *or* Zoology 37.
(b) Microbiology elective: Microbiology 31a, 33b, Botany 37a, Zoology 35b.
(c) Pre-medicine: Two full courses from Microbiology 26, Zoology 30a, 34a, 35b, 36.
(d) Zoology elective: Biology 37a, Zoology 37, and one of Zoology 30a, 34a, 35b.

Chemistry — Chemistry 34; *two of:* Chemistry 33, 36, 332, 335; two options (at least one from group A, B or C).

Geology — Three Geology courses in the 20's or 30's; two options (at least one from Chemistry 34, Physics 36, another Geology, or any option not taken in II Year).

Mathematics — At least three full courses in Mathematics; two options (at least one from group A, B or C).

Physics — Physics 31, 34, 36; two options (at least one from group A, B or C).

NOTE: 1. For the courses listed in groups A, B, C and D, see p. C-16.
2. The total number of Science courses is not to exceed twelve.
3. All options are to be selected in consultation with the Department in which the student is majoring.

HONOURS BIOLOGY

Admission requirements: Grade 13 English; Mathematics A; Chemistry; Physics; and at least one other credit (Mathematics B or Biology is recommended); OR equivalent "Preliminary Year Science". (An average of 60% is required in Mathematics and Science).

By the proper choice of subjects, a student completing the following program with second class honours may qualify for admission to courses leading to the Type A Certificate in Biology at the Ontario Colleges of Education.

First Year

Botany 10; Zoology 10; Physics 13; Chemistry 10; one course from Group A; one course from Group B or C; Library Science.

For admission to Second Year Honours, the student must obtain an average of at least 66% in each of Botany and Zoology, and an overall average of at least 60%.

Second Year Honours

Biology 228a, 237a, 229b; Chemistry 23, 24y; Mathematics 13; *either* Botany 222ab *or* Zoology 222; Theology or Philosophy 22 or option.

Third Year Honours

Biology 330b; Chemistry 36; option; plus one of the following options:

Botany option — Botany 334, Microbiology 326ab, Zoology 430a.

Microbiology option — Microbiology 326ab, Zoology 222 or Botany 222ab (whichever not previously taken), Zoology 435b.

Zoology option — Botany 222a, Microbiology 326ab, Zoology 336.

Fourth Year Honours

Biology 442b; Mathematics 31a; option in humanities or social sciences; plus one of the following options:

Botany option — Botany 400, 430a, 430b, 437a, 441b; Biology 438c, Zoology 437.

Microbiology option — Botany 437a, 441b; Chemistry 456a; Microbiology 400, 431a, 433b; Biology 438c.

Zoology option — Zoology 400, 430a, 434a, 437, 448b; Biology 438c.

HONOURS BIOPHYSICS

Admission requirements: Grade 13 English; Mathematics AB; Chemistry; Physics; OR "Preliminary Year Science". (An average of 60% is required in Mathematics and Science.)

First Year

Biology 11; Physics 10; Mathematics 11ab and 15; Chemistry 10; one course from Group A, B or C; Library Science.

For admission to Second Year Honours, the student must obtain an overall average of at least 60%, with 66% combined average in Mathematics and Science.

Second Year Honours

Biology 228a, 229b; Physics 222, 223; Mathematics 25ab, 31a; Chemistry 23.

Third Year Honours

Biology 330b; Microbiology 326a; Physics 331, 334, 336, 370/1; Chemistry 336; Mathematics 355b; one course from Group A, B or C.

Fourth Year Honours

Biology 400b; Physics 410, 411, 470/2; Chemistry 456a; Mathematics 35b; one course from Group A, B or C.

HONOURS CHEMISTRY

Admission requirements: Grade 13 English; Mathematics AB; Chemistry; Physics; OR equivalent "Preliminary Year Science". (An average of 60% is required in Mathematics and Science).

By the proper choice of subjects, a student completing the following program with second class honours may qualify for admission to courses leading to the Type A Certificate in Chemistry at the Ontario Colleges of Education. This program is accredited by the Chemical Institute of Canada.

First Year

Chemistry 10; Physics 10; Mathematics 11ab, 15; one course from Group A; one course from Group B or C; Library Science.

For admission to Second Year Honours, the student must obtain at least 66% in Chemistry, 60% in each of Mathematics and Physics, and an overall average of 60%.

Second Year Honours

Chemistry 223, 224, 232; Physics 26; Mathematics 25; one option.

Third Year Honours

Chemistry 332, 333, 335, 344; Mathematics 35a; German Ax or Russian Ax or option.

Fourth Year Honours

Chemistry 444x, 464, 449, 450y; Mathematics 22 or Chemistry 336x.

HONOURS CHEMISTRY AND BIOLOGY (BIOCHEMISTRY)

Admission requirements: Grade 13 English; Mathematics AB; Physics; Chemistry; OR equivalent "Preliminary Year Science". (An average of 60% is required in Mathematics and Science.)

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, Chemistry and Biology. This program is also accredited by the Chemical Institute of Canada.

First Year

Botany 10; Zoology 10; Mathematics 15; Chemistry 10; one course from Group A; one course from Group B or C; Library Science.

For admission to Second Year Honours, the student must obtain at least 66% in Chemistry, in Botany, and in Zoology, and an overall average of at least 60%.

Second Year Honours

Physics 13; Chemistry 222, 223, 224; Biology 228a; option.

Third Year Honours

Chemistry 333, 334x, 336; Biology 237a, 330b; German Ax or Russian Ax or option.

Fourth Year Honours

Chemistry 444, 446ab, 451y; Zoology 430a; Botany 430b; Microbiology 326ab.

HONOURS CHEMISTRY AND PHYSICS

Admission requirements: Grade 13 English; Mathematics AB; Chemistry; Physics; OR equivalent "Preliminary Year Science". (An average of 60% is required in Mathematics and Science.)

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, Physics and Chemistry. This program is accredited by the Chemical Institute of Canada.

First Year

Chemistry 10; Physics 10; Mathematics 11ab, 15; one course from Group A; one course from Group B or C; Library Science.

For admission to Second Year Honours the student must obtain at least 66% in each of Chemistry and Physics, and an overall average of at least 60%.

Second Year Honours

Chemistry 222, 223, 224; Physics 222, 223, 255b; Mathematics 25.

Third Year Honours (Chemistry Division) (for Physics Division, see p. C-50).

Chemistry 333, 334; Physics 334, 336, 370/1; Mathematics 35a; German Ax or Russian Ax or option.

Fourth Year Honours (Chemistry Division) (for Physics Division, see p. C-50).

Chemistry 444, 332, 335, 451y, 464; Physics 466a, 467b; one option.

HONOURS MATHEMATICS (SCIENCE)

Admission requirements: Grade 13 English; Mathematics AB; Physics, Chemistry; OR "Preliminary Year Science". (An average of 60% is required in Mathematics and Science.)

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, Mathematics.

First Year

Chemistry 10; Physics 10; Mathematics 11ab, 15; one course from Group A; one course from Group B or C; Library Science.

For admission to Second Year Honours, the student must obtain at least 66% in each of Mathematics and Physics of First Year, and an overall average of at least 60%.

Second Year Honours

Mathematics 227, 254ab; Physics 223, 255b; and **Either:** Mathematics 229 *and one of:*

Mathematics 20a/35b, Physics 222, option; **OR:** Mathematics 31a/35b, and Physics 222.

Notes: (1) After the completion of Second Year Honours, students may choose to enter Third Year Honours Physics.

(2) Physics 222 is required for admission to Third Year Honours Physics.

(3) Mathematics 229 is required for admission to Third Year Honours Mathematics.

Third Year Honours

Russian Ax or German Ax or option; Mathematics 300, 338a, 20a/35b*, 399y; *plus one of the following options:*

Applied Mathematics option — Mathematics 342b, 355b; Physics 355.

Pure Mathematics option — Mathematics 337, 342b, 354b.

Statistics option — Mathematics 330, 337.

Fourth Year Honours

Mathematics 499; Philosophy 22 or option; four other mathematical subjects, selected from the options below: (students wishing to concentrate in a specific field are advised to select one of the following options):

Applied Mathematics option — Mathematics 435a, 453, 354b; *two of:* Mathematics 449, 450, 451 (or Physics 455); Physics 450.

Pure Mathematics option — Mathematics 400, 444, 449a, 355b; one full course from: Mathematics 429b, 431a, 431b, 435a, 435b, 448, 449b.

Statistics option — Mathematics 400, 431ab, 435, 444.

*Mathematics 435 will replace Mathematics 20a/35b in 1968-69.

HONOURS PHYSICS

Admission requirements: Grade 13 English; Mathematics AB; Physics; Chemistry; OR "Preliminary Year Science". (An average of 60% is required in Mathematics and Science.)

This program includes sufficient credits to satisfy the requirements for admission to courses leading to the Type A Certificate in Physics at the Ontario Colleges of Education.

First Year

Chemistry 10; Physics 10; Mathematics 11ab, 15; one course from Group A; one course from Group B or C; Library Science.

For admission to Second Year Honours the student must obtain at least an average of 66% in each of Chemistry, Mathematics and Physics of the First Year, and an overall average of 60%.

Second Year Honours (with Mathematics)

Mathematics 227, 254ab; Physics 223, 255b; **Either:** Mathematics 31a, 35b, and Physics 222; **Or:** Mathematics 229 *and one of:* Mathematics 20a and 35b, Physics 222, or option.

Notes: (1) After the completion of the Second Year Honours, students may choose to enter Third Year Honours Mathematics.

(2) Physics 222 is required for admission to Third Year Honours Physics.

Second Year Honours (with Chemistry)

Chemistry 222, 223, 224; Physics 222, 223, 255b; Mathematics 25.

Note: (1) After the completion of the Second Year Honours, students may choose to enter Third Year Honours Chemistry and Physics (Chemistry Division).

Third Year Honours

Mathematics 338a, 355b; Physics 331, 334, 336, 355, 370; German Ax or Russian Ax or option.

Fourth Year Honours

Mathematics 453; Physics 450, 452a, 454b, 455, 466a, 467b, 470.

Note: (1) Students whose curricula did not include Mathematics 31a and 35b, may, with the permission of the Head of the Department, take these courses instead of three hours of the Senior Laboratory (Physics 470).

CERTIFICATE IN PUBLIC ADMINISTRATION

First Year

Bus. Ad. 15a: A Survey of Business Organization and Management.

Bus. Ad. 15b: Introduction to Financial Statements.

Pol. Sc. 20: Government of Canada.

Second Year

Bus. Ad. 250: Principles of Accounting.

Pol. Sc. 36: Municipal Government.

Third Year

Bus. Ad. 346: Personnel Management and Industrial Relations.

Pol. Sc. 35: Canadian Public Administration.

This program may be pursued only in the Extension Division.

Three of the prescribed courses are from the field of Business Administration and three from Political Science. At the rate of two subjects per year, the minimum time required for the Certificate is three years. The student may, however, extend this period by taking only one course per year.

If the candidate is under twenty-five years of age, he must have admission requirements as listed under "Regular Admission"; if he is twenty-five years of age or over, and does not have these regular admission requirements, he may be admitted to the program if he has had business experience or experience in civil administration.

Students must obtain an overall "C" average in the six prescribed courses to merit the Certificate. No supplemental examinations may be written in any of the subjects of the Certificate Program.

CERTIFICATE IN THEOLOGY

Admission requirements: Grade 13 English; Language or Mathematics; and at least three other credits; OR equivalent Preliminary Year. For admission as an Adult student, see p. B-9.

Program requirements: Theology 18
Theology 28
Theology 32
One of: Theology 10, 24, 31, 34
One of: Theology 20, 30
Any course in Theology not previously taken.

The Certificate in Theology may be pursued only in the Extension Division. At the rate of two subjects per session, the minimum time required for the Certificate is two years and one summer, or two summers and one year. The student may, however, extend this period if unable to take two courses per session. These courses may all be applied to the Bachelor of Arts degree.

Students must obtain an overall "C" average in the six courses to merit the Certificate. No supplemental examinations may be written in any of the subjects of the Certificate program.

SCHOOL OF NURSING

BACHELOR OF SCIENCE IN NURSING

I. PLAN I*

The nursing degree curriculum is designed on the premise that professional nursing has its basis in the biological, social and psychological sciences, and that its practitioner must be a well developed person, capable of intellectual growth, and a competent member of the health team serving the needs of society, in the care of the sick as well as in the promotion of health and prevention of disease.

It qualifies the student to write the nurse registration examinations, and includes preparation for a selected specialty field.

Admission requirements: Grade 13 English, Biology, Chemistry, and at least three more credits (Physics is recommended); OR equivalent "Preliminary Year".

First Year

English 15, Psychology 15, Philosophy 15, Sociology 12, Biology 34, Microbiology 16b, Theology or option, Nursing 10y†, Library Science.

On completion of the First Year, the student enters a basic diploma school of nursing for clinical education and experience. The choice of school is made in consultation with the Director of the University School of Nursing prior to the end of the academic year. The student is expected to maintain contact with the Director of the School during her clinical education and experience.

Students who registered in the course between September 1964 and September 1967 who re-enter the University for the final year of this degree program Plan I, may complete their studies within the new generalized degree program or have the option of following a selected program comparable to the present final year programs.

Final Year

One of the following combinations:

Nursing Education: Nursing 31, 32b, 33a; Psychology 26ab, 31; Philosophy 25; one option**.

Nursing Service Administration: Nursing 30a, 36b, 37; Psychology 26ab, 31; Philosophy 25; Business Administration 24a; one option**.

Public Health Nursing: Nursing 34, 35; Psychology 26ab, 31; Philosophy 25; one option**.

* This plan will be phased out after the 1967-68 academic session. It is the intent to replace it with the four-year generalized degree program which will qualify the student for nurse registration and will include basic preparation for Public Health Nursing.

† For beginning nurse students only.

**Choice of: English 25 or 27; Economics 15; History 26; Political Science 12 or 20; Sociology 23 or 29 or 31; or another option with the approval of the Director of the School of Nursing.

II. DEGREE PROGRAMS FOR REGISTERED NURSES

PLAN II-A.

As of September 1967 this program will become a three-year generalized program leading to the degree, Bachelor of Science in Nursing.

Students admitted to this program will follow the new three-year generalized degree program which will include the content area of public health nursing and the functional specialties of nursing education and nursing service administration previously structured as separate specialty programs in the final year.

Admission requirements:

(a) Ontario Grade 13 including English, Biology, Chemistry (Physics is recommended); OR equivalent "Preliminary Year".

(b) Nurse registration for the current year.

(c) One year's work experience following nurse registration.

Applicants seeking admission as adult students are required to have Ontario Grade 13 Biology and Chemistry (or equivalent).

First Year

English 15; Psychology 15; Sociology 12; Biology 34; Microbiology 16b; Philosophy 15; Library Science.

Second Year

Nursing 20, 21ab; Political Science 20; Psychology 22, 26.

Third Year

Nursing 30, 31ab; Psychology 31; two options.

PLAN II-B.

The purpose of this program is to permit students who have already completed a university level course in any of the specialized study areas to advance towards a degree in nursing. **This course will not be offered after August 1968.**

Admission requirements:

(a) Ontario Grade 13 including English, Biology, Chemistry (Physics is recommended); OR equivalent "Preliminary Year". Applicants seeking admission as adult students are required to have Ontario Grade 13 Biology and Chemistry (or equivalent).

(b) Evidence of successful completion of a post-basic diploma course at the University of Windsor in Nursing Education, Nursing Service Administration or Public Health Nursing, with an overall average of "C" or better in all of the course work, and grades of "C" or better in each Nursing subject.

(c) Nurse registration for the current year.

(d) Students having baccalaureate credits for a diploma course in Nursing Service Administration, Nursing Education or Public Health Nursing from another university will be considered individually and have programs planned for them on an individual basis beginning in September 1967.

Final Year

Nursing 36b*, 38*; Biology 34; Microbiology 16b; English 15; Philosophy 15*; Psychology 31; Psychology 22 or Sociology 23 or 27 or 31, or Philosophy 25; Library Science (if not previously taken).

*If previously taken, student will substitute one of: Psychology 22, or Sociology 23 or 29 or 31, or Philosophy 22 or 25 or 26.

DIPLOMA COURSES FOR REGISTERED NURSES

Admission requirements:

(a) Ontario Grade 13 including English, Biology, Chemistry (Physics is recommended); OR equivalent "Preliminary Year".

(b) Nurse registration for current year.

(c) Adult students, lacking full requirements may be granted admission on probation by action of the Admissions Committee. However, grade 13 biology and chemistry or equivalent must have been successfully completed prior to admission to the program.

N.B. Diploma programs in Nursing Education and Nursing Service Administration will be discontinued after June 1968. Effective September 1968 a newly structured diploma program in Public Health Nursing, giving preparation to registered nurses to **practice** public health nursing will replace the present one.

1967-68 Post-Basic Diploma Courses:

Nursing Education: Nursing 31, 32b, 33a; Psychology 15, 26ab; Sociology 12; Biology 34; Library Science.

Nursing Service Administration: Nursing 30a, 36b, 37; Psychology 15, 26ab; Sociology 12; Business Administration 24a; Biology 34; Library Science.

Public Health Nursing: Nursing 34, 35; Psychology 15, 26ab; Sociology 12; Biology 34; Library Science.

Observation periods, seminars, and concurrent and terminal field experience are component parts of all specialty study programs on both diploma and degree levels.

SCHOOL OF PHYSICAL AND HEALTH EDUCATION

The School of Physical and Health Education offers at the present time three programs: The first is a four year program in Arts and Physical and Health Education leading to a B.A. at the end of the third year with a minor in Physical Education and a B.P.H.E. at the end of the fourth year. This program will terminate in 1969 and is not available to 1967 high school graduates. The second, a one year program, leads to the Bachelor of Physical Education degree. This second program is available only until 1967-68. The third program, the new Honours Physical and Health Education program, will be introduced beginning with first and second years in 1967.

These courses have been designed to prepare the graduates to pursue graduate work, careers in high school, community colleges, industry, community programs, and universities.

PROGRAM IN ARTS AND PHYSICAL AND HEALTH EDUCATION

This program meets all of the requirements for admission to courses in the Ontario Colleges of Education leading to a type A certificate as outlined in Circular 649 of the Department of Education.

First and Second Years — discontinued in 1967.

Third Year (to be discontinued in 1968)

Physical Education 30, Biology 35, Psychology 26ab, two full courses in the major field.

On completion of Third Year in accordance with the regulations governing the General Course students will be awarded the B.A. degree, with minors in Psychology and Physical Education.

For admission to IV Year as a candidate for the B.P.H.E. degree a student must have obtained at least C average in the work of Third Year with at least B grade in Physical Education 10, 20 and 30. To pass Fourth Year a student is required to obtain at least a C average on the work of that year; however a B average is required to enter the Type A certificate program at the Colleges of Education.

Fourth Year (to be discontinued in 1969)

P.H.E. 450, 451a, 453a, 457a, 460b, 461a, 462b, 464b, 466b, 470.

PROGRAM LEADING TO THE B.P.E. DEGREE

(to be discontinued in 1968).

Admission requirement: Bachelor of Arts or Bachelor of Science degree, with at least one Psychology and one Biology course.

P.E. 400ab, 401a, 402b, 405b, 407b, 409b, 413b, 415a, 420, 444.

The Ontario College of Education will approve the above program for Admission to Type A courses provided the student meets the other basic requirements.

PROGRAM IN HONOURS PHYSICAL AND HEALTH EDUCATION

Admission requirements: Grade 13 English, Language or Mathematics A, and at least three other credits. Or "Preliminary Year Arts".

This program meets all of the requirements for admission to courses in the Ontario Colleges of Education leading to a Type A Certificate as outlined in Circular 649 of the Department of Education.

First Year

P.H.E. 11 and 15; Biology 11; Psychology 15; one course from Group A; two options; Library Science.

For admission to Second Year Honours, an overall average of at least 60% is required, and 66% in each of Physical and Health Education 11 and 15.

Second Year Honours

P.H.E. 215, 251c, 252, 253c, 254; Psychology 22; one course from Group A, C, or D; one option.

Third Year Honours

P.H.E. 315, 351a, 352c, 353c, 354b, 355; Biology 35; one Psychology option; two options.

For admission to Fourth Year, in addition to the honours requirements, a student must be recommended by the School of Physical and Health Education.

Fourth Year Honours

P.H.E. 451, 452a, 454, 455c, 456c, 458a, 460b, 461a, 462c, 470.

PROGRAM IN SOCIAL WORK

Students intending to enter Social Work careers are advised to take the following program leading to the B.A. degree with major in Social Sciences. At the same time they may take additional courses in Social Work in the summer months along with field observation and practice to qualify for the Diploma in Social Work as outlined below.

Others who already hold a B.A. degree with major in social sciences may also be admitted to the summer sessions leading to the Diploma in Social Work or may be admitted to a make-up year in 1968-69 prior to the inauguration of the graduate program.

The summer sessions will run for 12 weeks (May 15th to August 15th) and academic work is taken concurrently with field observation and experience.

B.A. WITH MAJOR IN SOCIAL SCIENCES AND DIPLOMA IN SOCIAL WORK:

First Year

Social Work 21; Sociology 12; Psychology 15; Economics 15 or 19; *two of:* Biology 11, Philosophy 15, English 15, a language, or option.

Summer Session I

Social Work 23; Philosophy 15 or option; field observation.

Second Year

Sociology 23 and 29; Psychology 22; Political Science 12 or 20; Theology 27 or 37 or option.

Summer Session II

Social Work 35; Social Work 31 or 32; field practice.

Third Year

Sociology 37; Psychology 31 and 34; Economics 36; Political Science 30 or 35.

Summer Session III

Social Work 41 and 45; field practice.

NOTE: Students in II and III Years will attend additionally one hour a week discussion in consultation with the Head of the Department.

DETAILS OF SUBJECTS

Subject Code

Courses in the Preliminary Year are numbered 1-9 (General); courses in the First Year are numbered 10-19 (General); courses in the Second Year are numbered 20-29 (General) and 200-299 (Honours); courses in the Third Year are numbered 30-39 (General) and 300-399 (Honours); courses in the Fourth Year are numbered 400-499 (Honours). Graduate courses are numbered 500 and up.

A course designated by the letter "A" only, is, in difficulty and weight, equal to a Secondary School Grade Twelve (Ontario) course in the same subject.

Every subject extends over the complete academic year (two semesters) and counts as a full course, except where otherwise indicated. A course whose number is followed by "a", "b", or "y" is a half course, given usually in the first semester, the second semester, or throughout the year, respectively; the letter "c" indicates a half course, which may be taught either first or second semester. For semester equivalents, see p. C-137.

The above code was adopted in 1958.

ANTHROPOLOGY

(See p. C-130.)

ASIAN STUDIES

Officer of Instruction:

Professor: J. W. Spellman, Ph.D. (Head of the Department).

10. Indian Civilization: An introductory course dealing with the religion, literature, philosophy, politics, arts and history of India from earliest times to the present. *(3 lectures a week.)*

20. Indian Literature: An introductory course with readings in translation of Indian literature from earliest times to the present; sacred texts, dramas, novels and poetry will be examined as they affected and influenced Indian thought and culture. *(3 lectures a week.)*

BIOLOGY

Officers of Instruction

Professor: R. J. Doyle, Ph.D. (Head of the Department).
W. G. Benedict, Ph.D.

Associate Professors: M. L. Petras, Ph.D.
H. D. McCurdy, Ph.D.
L. R. Sabina, Ph.D.

Assistant Professors: Rev. J. R. Dougherty, C.S.B., M.S.
D. T. N. Pillay, Ph.D.
J. M. Winner, M.S.
J. E. J. Habowsky, Ph.D.
A. H. Warner, Ph.D.

Sessional Instructor: Mrs. G. Winner, B.Sc.

Major requirements: five to seven courses, including Botany 10, Zoology 10, Biology 28a, 29b, 30b, 38.

Minor requirements: three to five courses, including Biology 11, and 34 or 35.

For major in general course, see p. C-45; for Honours Biochemistry, see p. C-48; for Honours Biology, p. C-46; for Honours Biophysics, p. C-47.

I. BIOLOGY

11. Principles of Biology: The fundamental principles of biology with stress on the cell as a unit, the origin and preservation of the individual and the race, the mode of inheritance, and the applications of biology to social and economic problems. Illustrated by examples from the botanical and zoological fields. (Not open to science majors). *(2 lectures, 2 laboratory hours a week.)*

16a. Chemical Aspects of Biology: An introduction to chemical principles and organic compounds of biological application. A course intended for students of nursing, and other fields, who desire a brief introduction to biological chemistry. It is a prerequisite for Microbiology 16b. (Prerequisites: Biology 11, Chemistry 1). *(3 lectures, 3 laboratory hours a week; one semester (half course).)*

28a. Cytology: A study of the organelles and organization of plant and animal cells. (Prerequisites: Botany 10 and Zoology 10, or permission of the instructor). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

29b. Principles of Genetics: An introduction to Mendelian inheritance, chromosome and gene theory, and the genetic concept of species. (Prerequisite: Zoology 10, Botany 10 and Math 1 or 4). *(3 lectures a week; second semester (half course).)*

30b. Cellular Physiology: A course designed to acquaint the student with the general principles and methods of cellular physiology and with laboratory techniques used in physiological investigation. (Prerequisites: Chemistry 23 and Physics 13. Corequisite: Chemistry 36). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

34. Human Physiology: A survey of the functions of the human body. This course is intended for students of nursing, and other fields, who desire an introduction to human physiology. Lectures are same as Biology 35. Not open to majors in Biology Department. (Prerequisite: Biology 11). *(2 lectures, 1 demonstration hour a week).*

35. Human Physiology: Lectures are same as Biology 34. This course is designed for physical education students and is open to a limited number of others with approval of Biology Department. Not open to majors in Biology Department. (Prerequisite: Biology 11). *(2 lectures, 3 laboratory hours a week).*

37a. Ecology: Organisms in relation to their environment. Individual plants and animals are treated, as well as communities and populations. (Prerequisites: Botany 10 and Zoology 10). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

38c. Undergraduate Seminar. *(2 hours a week, one semester; half course).*

Honours Courses

228a. Cytology: A study of the organelles and organization of plant and animal cells. (Prerequisites: Botany 10 and Zoology 10, or permission of the instructor). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

229b. Genetics: Mendelian genetics, chromosome and gene theory, linkage and crossing-over, sex-determination and sex-linkage, cytogenetic aberrations, the nature and action of the gene, mutation and population genetics. (Prerequisite: Zoology 10, Botany 10, and Mathematics 1 or 4). *(3 lectures a week; one semester (half course).)*

237a. Ecology: Plants and animals in their relations to each other and to their environment; special emphasis will be placed on the study of the aquatic ecosystem. (Prerequisites: Botany 10 and Zoology 10). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

330b. Cellular Physiology: Principal problems and methods of cellular physiology including the effects of environmental factors, structure and function of cell organelles and plasma membrane; growth, respiration and irritability. The laboratory is designed to familiarize the student with some of the basic techniques employed in physiological investigation, notably manometric and electrometric methods. One term paper will be required. (Prerequisites: Chemistry 23, Physics 13; corequisite: Chemistry 36). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

438c. Undergraduate Seminar. *(2 hours a week, one semester (half course).)*

442b. Evolution: Topics include the origin of organisms, the interaction of gene mutation, selection and population characteristics in the process of evolution, mechanisms of speciation, and current problems in evolution. *(3 lectures a week, one semester; half course).*

443. Aquatic Biology: This course will consider the physical and chemical properties of natural waters in relation to biotic communities in the aquatic environment. Major emphasis will be placed on the biology of local waters, although some consideration of the estuarine and marine environments will be undertaken. (Prerequisites: Botany 10, Zoology 10, Chemistry 10, Biology 37a). *(2 lectures, 3 laboratory hours a week).*

449b. Biological Statistics: Lectures in basic statistical principles and methods applicable to the field of biology. An introduction to the elements of sampling, experimental design and analysis of variance are included. Laboratory periods for practical experience will be arranged. (Prerequisite: Consent of instructor). *(2 lectures a week; one semester; half course).* (Discontinued, 1967).

II. BOTANY

10. Introductory Botany: Properties and activities of protoplasm and the anatomy and physiology of roots, stems, leaves, flowers and fruits. Type forms of the Thallophytes, Bryophytes and Tracheophytes are studied as to their taxonomy, structure, growth, reproduction, ecology and economic importance. (For majors in biological sciences. Corequisite: Zoology 10). *(2 lectures and 3 laboratory hours a week).*

22a. Plant Morphology: A comparative study of gross structure of vascular plants including techniques to demonstrate the functional relationships of the plant structures. (Prerequisite: Botany 10). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

22b. Plant Anatomy: A comparative study of microscopic structure of vascular plants including histological techniques to demonstrate the internal specializations of the plant tissues. (Prerequisite: Botany 22a). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

30a. Plant Physiology: General principles relating to cellular functions, water relations and nutrition. (Prerequisite: Botany 10; corequisite: Chemistry 36; or consent of instructor). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

30b. Plant Physiology: General principles relating to cellular metabolism, growth and morphogenesis. (Prerequisite: Botany 10; corequisites: Biology 30b and Chemistry 36). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

34. Plant Taxonomy: Morphology, identification, nomenclature and classification of the flowering plants. Introduction to development of taxonomy, plant exploration, migration of floras, climate and natural vegetation, and phylogeny. (Prerequisite: Botany 10). *(2 lectures, 3 laboratory hours a week).*

37a. General Mycology: Characteristics, habits and life-histories of various groups of true fungi. (Prerequisites: Botany 10, Chemistry 10, Zoology 10). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

Honours Courses

222a. Plant Morphology: A comparative study of gross structure particularly among the Pteridophyta and Embryophyta. Experimental methods and techniques are employed to demonstrate the functional relationships of the plant structures. (Prerequisite: Botany 10). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

222b. Plant Anatomy: A comparative study of microscopic structure with emphasis on the principles relating to anatomical and reproductive specialization particularly in the vascular plants. Histological techniques are employed to demonstrate the specializations in function of the internal structures. (Prerequisite: Botany 222a). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

334. Plant Taxonomy: Morphology, identification, nomenclature, and classification of the flowering plants. Studies on modern systems of classification, plant exploration, migration of floras, climate and natural vegetation, and phylogeny of plants. (Prerequisite: Botany 10). *(2 lectures, 3 laboratory hours a week.)*

400. Undergraduate Problems Course In Botany: Completion of undergraduate research project including submission of written final report. (Prerequisite: Consent of department). *(4 laboratory hours a week.)*

430a. Plant Physiology: General principles relating to cellular functions, water relations (absorption, transpiration, translocation), mineral nutrition and photosynthesis. (Prerequisites: Botany 10, Biology 330b, Chemistry 36). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

430b. Plant Physiology: General principles relating to respiration, digestion, nitrogen metabolism, growth and morphogenesis, with emphasis on germination, dormancy, growth substances and other physiological phenomena associated with development. (Prerequisite: Botany 430a, or consent of instructor). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

437a. General Mycology: Biology of the true fungi with emphasis on the experimental approach. (Prerequisites: Chemistry 10, Botany 10). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

441b. Plant Pathology: A survey of the diseases of plants. Techniques employed in phytopathological research are utilized in the laboratory. (Prerequisite: Botany 437a). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

III. MICROBIOLOGY

16b. Bacteriology for Nurses: A survey of elementary bacteriology including structure, classification and physiology of bacteria with examination of the micro-organisms of medical importance. (Prerequisites: Biology 11 and 16a, Chemistry 1). *(3 lectures and 3 laboratory hours a week; one semester (half course).)*

26. General Microbiology: Structure, reproduction, classification, growth and metabolism and control and death of fungi, bacteria and viruses. The special aspects of microbiology, such as sanitary microbiology, immunology, industrial microbiology, microbial genetics and microbiology of special environments will also be surveyed. (Prerequisites: Zoology 10 and Botany 10 and Physics 13; corequisite: Chemistry 23). *(2 lectures, 3 laboratory hours a week.)* (Discontinued, 1967).

26a. General Microbiology: Structure, reproduction, growth, genetics, metabolism, control and death of fungi, bacteria and viruses. (Prerequisites: Zoology 10, Botany 10, Physics 13; corequisite: Chemistry 23). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

26b. Immunology: A study of the basic principles of immunology with special emphasis upon viruses and viral immunity. (Prerequisite: Microbiology 26a). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

31a. Pathogenic Microbiology: Bacteria and other micro-organisms in relation to disease. (Prerequisites: Microbiology 26a and 26b). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

32b. Medical Microbiology: A continuation of course 31a, including consideration of rickettsial and viral infections; a study of basic principles in immunology. (Prerequisite: Microbiology 31a). *(2 lectures, 3 laboratory hours a week; one semester (half course).)* (Discontinued, 1967).

33b. Food, Dairy and Sanitary Microbiology: Microbiology of food, dairy and water supplies. (Prerequisite: Microbiology 26a, 26b). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

Honours Courses

326. General Microbiology: A survey of the important groups of micro-organisms with emphasis upon the bacteria and viruses. Major topics considered will be the cytology, taxonomy, growth, nutrition, physiology, death and variation of these organisms. Minor topics will include host-parasite relations, pathogenicity, chemo-therapy, water, food and soil bacteriology. (Prerequisites: Botany 10, Chemistry 23; Chemistry 36 is advised as a co-requisite). *(2 lectures, 3 laboratory hours a week.)* (Discontinued, 1967).

326a. General Microbiology: A survey of the important groups of micro-organisms with emphasis on the bacteria. Cytology and reproduction, classification, growth, genetics, metabolism, control and death are the major topics. (Prerequisites: Botany 10, Zoology 10, Chemistry 23; Chemistry 36 is advised as a corequisite). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

326b. Immunology: A study of basic principles of immunology with special emphasis upon viruses and development of immunologic control of transplanted tissue. (Prerequisite: Microbiology 26a or 326a). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

400. Undergraduate Problems Course in Microbiology: Completion of undergraduate research project including submission of written final report. (Prerequisite: Consent of department). *(4 laboratory hours a week.)*

431a. Pathogenic Microbiology: Bacteria and other micro-organisms in relation to human disease. Emphasis will be upon morphological, cultural and pathogenic characteristics of these organisms. (Prerequisites: Microbiology 26a and 26b). *(2 lectures, 3 laboratory hours a week; one semester; half course.)*

432b. Medical Microbiology: A continuation of course 431a, including consideration of rickettsial and viral infections; a study of basic principles in immunology; and development in immunological control of transplanted tissue. (Prerequisite: Microbiology 26ab). *(2 lectures, 3 laboratory hours a week, one semester; half course).* (Discontinued, 1967).

433b. Food, Dairy and Sanitary Microbiology: Microbiology of food, dairy products and water supplies with emphasis upon standard laboratory procedures for their examination. (Prerequisite: Microbiology 26a, 26b). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

IV. ZOOLOGY

10. Introductory Zoology: The principles of animal biology as illustrated by a study of the structure and physiology of representative forms. (For majors in biological sciences, corequisite: Botany 10). *(2 lectures, 3 laboratory hours a week.)*

22. Comparative Vertebrate Zoology: Comparative function and structure of vertebrate organ systems. (Prerequisite: Zoology 10 and Botany 10). *(2 lectures, 3 laboratory hours a week.)*

30a. Animal Physiology: The principles of animal physiology as illustrated by a study of the functions of the major organ systems of higher forms. (Prerequisite: Chemistry 23, Physics 13, Zoology 22). *(2 lectures, 3 laboratory hours a week, one semester (half course).)*

34a. Embryology: Development of vertebrates. (Prerequisite: Zoology 22). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

35b. Parasitology: The various groups of animal parasites from the point of view of morphology, systematics and life history. In the laboratory, the methods of diagnosis of human diseases caused by parasitic protozoa and helminths will be emphasized. (Prerequisite: Zoology 10). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

36. Histology: General and special histology. (Prerequisite: Zoology 22). *(2 lectures, 3 laboratory hours a week).*

37. Invertebrate Zoology: A survey of the principal lower animals, including their life cycles, comparative anatomy, physiology and embryology. (Prerequisite: Zoology 10 or Biology 11 (60%)). *(2 lectures, 3 laboratory hours a week.)*

Honours Courses

222. Comparative Vertebrate Zoology: Phylogeny of the chordates; comparative anatomy of the various organ systems and their physiology in chordates; selected reading and discussions. (Prerequisite: Zoology 10 and Botany 10). *(2 lectures, 3 laboratory hours a week.)*

336. Histology: Microscopic examination of the primary tissues and their modifications: epithelium, connective, muscular and nervous tissues. Organology: study of the organs and organ systems of the body. Histological methods: preparation of tissues for microscopic examination. (Prerequisite: Zoology 22). *(2 lectures, 3 laboratory hours a week).*

400. Undergraduate Problems Course in Zoology: Completion of undergraduate research project including submission of written final report. (Prerequisite: Consent of department). *(4 laboratory hours a week.)*

430a. Animal Physiology: A comparative survey of animal body functions with emphasis on the major organ systems. (Prerequisites: Chemistry 23, Physics 13, Zoology 222 or 22). *(3 lectures, 3 laboratory hours a week; one semester (half course).)*

434a. Vertebrate Embryology: Early development of vertebrates, with emphasis on current concepts of differentiation. (Prerequisite: Zoology 22). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

435b. Parasitology: A study of the various groups of animal parasites from the point of view of morphology, systematics and life history. In the laboratory, the methods of diagnosis of human diseases caused by parasitic protozoa and helminths will be emphasized and the identification of arthropods of medical significance will be considered. (Prerequisite: Zoology 10 and Botany 10). *(2 lectures, 3 laboratory hours a week; one semester (half course).)*

437. Comparative Invertebrate Zoology: Phylogeny of the invertebrates; morphology; discussion of various systems and their functions; life cycles; embryology; local invertebrate fauna. (Prerequisite: Zoology 10 and Botany 10). *(2 lectures, 3 laboratory hours a week.)*

444b. Developmental Biology: A study of nucleo-cytoplasmic interactions and the role of the nucleic acids during embryonic development. (Prerequisite: Zoology 34a, Chemistry 36, and/or consent of the instructor). *(3 lectures a week; one semester (half course).)*

448b. Microtechnique: A laboratory course introducing a variety of research techniques: embedding and sectioning, staining, cyto- and histochemical methods, photomicrography, electron microscopy, and similar techniques. (Prerequisites: Biology 28a, and consent of instructor). *(2 lectures, 4 laboratory hours a week; one semester (half course).)*

CHEMISTRY

Officers of Instruction:

Professors: K. G. Rutherford, Ph.D. (Head of the Department).
F. A. DeMarco, Ph.D.
R. J. Thibert, Ph.D.

Associate Professors: *Rev. G. W. Kosicki, C.S.B., Ph.D.
S. J. W. Price, Ph.D.
E. W. Channen, Ph.D.
W. J. Holland, Ph.D.

Assistant Professors: G. W. Wood, Ph.D.
D. J. McKenney, Ph.D.
R. C. Rumfeldt, Ph.D.
E. J. Bounsall, Ph.D.

*On leave.

Major requirements: five to seven courses, including 10, 22, 23, 24, 34; and two of 33, 36, 332, 335.

Minor requirements: three to five couses, including 10, 23, 36.

For the General course with Chemistry Major, see p. C-45; for Honours Chemistry, p. C-47; for Honours Chemistry and Biology, p. C-48; for Honours Chemistry and Physics, p. C-48.

1. Basic Chemistry: An elementary course including a discussion of the elements, compounds, chemical reactions, periodic classification, chemical equilibria, atomic and nuclear structure. The various concepts in chemistry will be exemplified by the use of problems, demonstrations and laboratory exercises. *(2 lectures (full year); 3 laboratory hours a week (one semester only).)*

10. General Chemistry and Qualitative Analysis: A course in general chemistry with special emphasis on the physical aspects. Course includes one lecture a week on Qualitative Analysis for one semester, three laboratory hours a week; General Chemistry for one semester and three laboratory hours a week of Qualitative Analysis for one semester. (Prerequisite: Chemistry 1 or Grade 13 Chemistry). *(3 lectures, 3 laboratory hours a week.)*

22. Quantitative Analysis: An introductory course in the theory and practice of quantitative analytical chemistry. (Prerequisite: Chemistry 10). *(2 lectures, 3 laboratory hours a week.)*

22z. Quantitative Analysis: An introductory course in the theory and practice of quantitative analytical chemistry, with emphasis upon volumetric analysis. (Prerequisite: Chemistry 10). *(2 lectures a week, both semesters; 3 laboratory hours a week, one semester (full course).)*

23. Organic Chemistry: A fundamental approach to aliphatic and aromatic chemistry with practical laboratory experience. (Prerequisite: Chemistry 10). *(2 lectures, 3 laboratory hours a week.)*

23z. Organic Chemistry: Same content as Chemistry 23. *(2 lectures a week, both semesters; 3 laboratory hours a week, one semester).*

24. Physical Chemistry I: Thermodynamics and chemical equilibrium. (Prerequisites: Mathematics 15, Chemistry 10). *(2 lectures a week.)*

24y. Physical Chemistry: Introductory course for students of Biology, pre-medicine and pre-dentistry. (Prerequisite: Chemistry 10). *(2 lectures a week (half course).)*

33. Intermediate Organic Chemistry: An intermediate course on the application of stereochemistry, kinetics and thermodynamics to organic chemistry. Heterocyclic compounds and absorption spectra. (Prerequisite: Chemistry 23). *(2 lectures, 3 laboratory hours a week.)*

33x. Intermediate Organic Chemistry: The same as Chemistry 33, but without laboratory periods. *(2 lectures a week.)*

34. Physical Chemistry II: Changes of state, solutions and phase equilibrium, kinetic theory, electrochemistry, introduction to reaction kinetics. (Prerequisite: Chemistry 24). *(3 lectures, 3 laboratory hours a week.)*

34x. Physical Chemistry II: The same as Chemistry 34, but without laboratory periods. *(3 lectures a week).*

36. Biochemistry: An introductory course in biochemistry with practical laboratory exercises. (Prerequisite: Chemistry 23). *(2 lectures, 3 laboratory hours a week.)*

36x. Biochemistry: The same as Chemistry 36, but without laboratory periods. *(2 lectures a week.)*

Honours Courses

222. Quantitative Analysis: An introductory course in gravimetric and volumetric analysis. (Prerequisite: Chemistry 10). *(2 lectures, 3 laboratory hours a week.)*

223. Organic Chemistry: A fundamental approach to aliphatic and aromatic organic chemistry with special emphasis on the molecular orbital and resonance theories. (Prerequisite: Chemistry 10). *(3 lectures, 3 laboratory hours a week.)*

224. Physical Chemistry I: Thermodynamics, chemical equilibrium. (Prerequisite: Mathematics 15, Chemistry 10). *(2 lectures a week.)*

232. Quantitative Analysis: The same as Chemistry 222, but includes a total of 6 laboratory hours a week.

332. Intermediate Analytical Chemistry: A course on quantitative analysis involving instrumental methods and special techniques. (Prerequisite: Chemistry 22 or 222 or 232). *(2 lectures, 3 laboratory hours a week.)*

333. Intermediate Organic Chemistry: An intermediate course on the application of stereochemistry, kinetics and thermodynamics to organic chemistry. Heterocyclic compounds and absorption spectra. (Prerequisite: Chemistry 223). *(2 lectures, 3 hours laboratory, first semester; 6 hours laboratory, second semester.)*

334. Physical Chemistry II: Changes of states, solutions and phase equilibria, kinetic theory, electrochemistry. Introduction to reaction kinetics. (Prerequisite: Chemistry 224). *(3 lectures, 3 laboratory hours a week.)*

334x. Physical Chemistry II: The same as 334, but without laboratory. *(3 lectures a week.)*

335. Inorganic Chemistry: A study of electronic structure and periodic relationships between the elements and binary compounds thereof, with emphasis on bond types, thermochemistry and structure. The descriptive chemistry of some of the more familiar inorganic species is considered, particularly in the light of the physiochemical methods used in studying these species in dry reactions, aqueous and non-aqueous solutions and gas phase reactions. (Prerequisite: Chemistry 10, and Chemistry 22 or 222 or 232). *(2 lectures a week, full year; 3 laboratory hours a week, one semester.)*

336. Biochemistry: An intensive general course with laboratory exercises designed to acquaint the student with the theory, problems, and laboratory procedures. (Prerequisite: Chemistry 23 or 223). *(3 lectures, 3 laboratory hours a week.)*

336x. Biochemistry: The same as 336, but without laboratory. *(3 lectures a week.)*

344. Physical Chemistry II: The same as 334, but a total of 6 laboratory hours a week is required.

444. Physical Chemistry III: Reaction kinetics, photo and radiation chemistry, chemical statistics. (Prerequisite: Chemistry 334 or 334x or 344). *(2 lectures, 3 laboratory hours a week.)*

444x. Physical Chemistry III: The same as 444, but without laboratory. *(2 lectures a week.)*

446a. Intermediate Biochemistry: Special topics in biochemistry including enzymes, hormones, intermediate metabolism, clinical biochemistry, and biochemical research methods. (Prerequisite: Chemistry 36 or 336). *(3 lectures, 3 laboratory hours a week, one semester (half course).)*

446b. Intermediate Biochemistry: A continuation of 446a. (Prerequisite: Chemistry 36 or 336). *(3 lectures, 3 laboratory hours a week, one semester (half course).)*

449. Research: Original laboratory research in specialized topics. *(1 lecture, 13 laboratory hours a week.)*

450y. Seminar: Discussion of selected topics from current literature. *(1 hour a week (half course).)*

451y. Seminar: The same as 450y, but a literature paper is also required. *(1 hour a week (half course).)*

456a. Intermediate Biochemistry: Same as 446a but without laboratory. (Prerequisite: Chemistry 36 or 336). *(3 lectures a week, one semester (half course).)*

456b. Intermediate Biochemistry: Same as 446b but without laboratory. (Prerequisite: Chemistry 36 or 336). *(3 lectures a week, one semester (half course).)*

464. Physical Chemistry IV: Surface, colloid and polymer chemistry. (Prerequisite: Chemistry 334 or 344). *(2 lectures, 3 laboratory hours a week.)*

464x. Physical Chemistry IV: The same as 464, but without laboratory. (Prerequisite: Chemistry 334 or 344). *(2 lectures a week.)*

CLASSICS

Officers of Instruction:

Associate Professor: Charles Fantazzi, Ph.D. (Head of the Department).

Assistant Professors: Wm. Felver, M.A.
C. W. Querbach, M.A.

Lecturer: Mrs. C. A. Querbach, M.A.

Sessional Instructors: Claire Coughlin, B.A.
Robert Wallin, B.A.

For major in general course, see p. C-23; for Honours English and Latin, see p. C-28; French and Latin, p. C-30; English and Philosophy, see p. C-29; Philosophy and Latin, see p. C-35.

I. GREEK

A. Elementary: Introduction to Greek grammar. Selected readings from Greek authors and the New Testament. *(4 hours a week.)* (Discontinued, 1967).

2. Intermediate: Selected shorter dialogues of Plato, the *Apology of Socrates* and a play of Aristophanes. Prose composition. *(3 hours a week.)* (Discontinued, 1967).

4. Introductory Greek: Vocabulary, morphology and syntax. Selections from classical authors and New Testament. *(5 lectures a week).* Formerly Greek A and Greek 2.

12. Advanced: Euripides' *Alcestis* and *Bacchae.* Selections from the history of Thucydides. Prose composition. *(3 hours a week.)*

37. Greek Literature in Translation. *(3 hours a week.)*

Honours Courses

322. Early dialogues of Plato. Speeches of Lysias and Demosthenes. *(3 hours a week.)*

II. LATIN

Major requirement: from five to seven courses, including 12, 21, 38.
Minor requirement: from three to five courses, including 12, 21.

A. Elementary: The work of Grade 12 or its equivalent is covered. *(4 hours a week.)* (Discontinued, 1967).

2. Intermediate: Selections from Latin prose and poetry, composition and sight translation. (Prerequisite: Grade 12 or equivalent). *(3 hours a week.)* (Discontinued, 1967).

4. Introductory Latin: Rapid coverage of forms and structure. Selected readings. *(5 lectures a week).* Formerly Latin A and Latin 2.

12. Advanced: Virgil's *Aeneid* I-VI. Selections from Latin prose authors. Technique of sight translation and rapid reading skills. (Prerequisite: Latin 4 or equivalent). *(3 lectures a week.)*

Latin 12 or equivalent is the only prerequisite for the following courses whether numbered in the 20's or 30's.

21. Roman Historians: Readings in Latin and lectures on the history of the various periods. *(3 hours a week.)*

22. Lyric Poetry: Catullus and Horace; elegiac poets of the Augustan age. *(3 hours a week.)*

24. Medieval Latin: Main emphasis on rapid reading and comprehension of philosophical and ecclesiastical Latin. Offered at Holy Redeemer College only. *(3 hours a week.)*

25. The Aeneid: The entire poem will be read. *(3 hours a week.)*

26. Essays of Cicero: *De Amicitia; De Senectute;* portions of other essays. *(3 hours a week.)* (Discontinued, 1967).

31. Roman Satire: Horace, Juvenal and selected epigrams of Martial. *(3 hours a week.)* (Not offered, 1967-68).

35. Ovid's Metamorphoses and Love Poetry: Study of classical myths. *(3 lectures a week).*

38. Survey of Latin Literature: A comprehensive view of the literature from the fragments of the earliest Latin authors to the end of the Empire. *(3 hours a week.)*

Honours Courses

222. Lyric Poetry: Study of Catullus' poems in the light of Alexandrian canons of style. Structural and linguistic analysis of Horace's *Odes* and *Epodes.* Selections from Tibullus and Propertius, and from various works of Ovid. *(3 hours a week.)*

224. Medieval Latin: Later ecclesiastical and philosophical writers, with particular emphasis on the acquisition of a fluent reading knowledge of the texts of Thomas Aquinas. *(3 hours a week.)* (Discontinued, 1967).

225. The Aeneid: Artistic design of the poem; study of epic conventions and diction; metrical analysis; use of Servius' *Commentary. (3 hours a week.)*

331. Roman Satire: Complete investigation of the Roman genre of satire. Fragments of the earlier writers; intensive reading of Horace's *Satires* and *Epistles,* Juvenal and Persius. *(3 hours a week.)* (Discontinued, 1967).

332. Roman Comedy: Representative plays of Plautus and Terence. Origins and conventions of the ancient theatre. Reading in translation of the plays of Aristophanes and Menander. Examination of the colloquial Latin of the comedies and of Petronius' *Satyricon. (3 hours a week.)*

333. Lucretius and Cicero: *De Rerum Natura* will be read in its entirety. Greek and Roman Epicureanism and atomist theories. Cicero's *Tusculan Disputations, De Natura Deorum* and *De Oratore. (3 hours a week.)* (Not offered, 1967-68).

338. Survey of Latin Literature: An introduction to early Latin; specimens of both major and minor writers of the Golden and Silver Ages. Reading of the authors will be done mainly in Latin, with some supplementary reading in English translation. *(3 hours a week.)*

450. Virgil's Bucolics and Georgics: Careful comparison of Virgil's poems with their Greek models; Virgilian poetic technique. The development of pastoral poetry in the vernacular languages and the ubiquitous influence of the *Bucolics. (3 hours a week.)*

451. Cicero's Speeches: Rhetorical analysis of certain speeches; more rapid reading of others. *(3 hours a week.)*

463y. Continuous Prose Composition: Practice in writing longer Latin periods. Clear arrangement of clauses: detailed study of Ciceronian models. *(1 hour a week.)*

DRAMA AND SPEECH

Officers of Instruction:

Associate Professor: Daniel P. Kelly, M.A.

Assistant Professor: A. Owen Klein, M.A.

Major requirements: from five to seven courses, including Drama 10; and at least *two of:* Drama 22, Drama 28, Speech 20, Speech 24; *and 2 of:* Drama 34, Drama 38, Speech 30, Speech 32.

Minor requirements: from three to five courses, including Drama 10 and at least 2 others. Options: Drama 10 or Drama 25.

For major in the general course, see p. C-23; for Honours Drama and English, and Honours Drama and Speech, p. C-24.

I. DRAMA

10. Use and Management of the Voice: This course is a prerequisite for Drama 22, 28, 34, 38. The control and development of the voice. Gross anatomy and physiology of the speech mechanism; training in relaxation and poise; breath control; tone production; voice range and articulation. The principles of good voice production are applied and developed in practical classes and laboratory work. The class is especially recommended for students who intend to enter professions where good speech is an aid to accomplishment such as teaching, law, business, etc. *(3 hours a week.)*

22. Oral Interpretation: Consideration of the problems of speech in performance, of prose and verse for the purpose of interpretation. *(3 hours a week).*

25. Introduction to the Theatre: A survey of the principal periods of the theatre, introducing the student to the architecture, acting styles and dramatic literature of these periods. *(3 hours a week).*

28. Acting: Fundamentals of acting including stage movement, mime, improvisations and the acting of scenes. *(5 hours a week).*

34. Play Direction: The study and presentation of plays from the selection of the play to the completed production. *(5 hours a week).*

38. Styles of Acting: A study of the theories and techniques of acting in various dramatic styles. *(3 hours a week).*

Honours Courses

222. Oral Interpretation: Consideration of the problems of speech in performance of prose and verse for the purpose of interpretation. Laboratory projects, assigned readings and term papers. *(3 hours a week).*

228. Acting: Fundamentals of acting including stage movement, mime, improvisation and the acting of scenes. Assigned readings and term papers. *(5 hours a week).*

335. History of the Theatre: A study of the development of theatrical art from its beginnings to 1700. *(3 hours a week).*

338. Styles of Acting: A study of the theories and techniques of acting in various dramatic styles. Assigned readings and term papers. *(3 hours a week).*

425. Advanced History of the Theatre: A study of the development of theatrical art from 1700 to modern times. (Prerequisite: Drama 335). *(3 hours a week).*

434. Play Direction: The study and presentation of plays from the selection of the plays to the completed production. Laboratory projects and assigned readings. *(5 hours a week).*

II. SPEECH

15y. Public Speaking. *(1 hour a week (half course).)* (Discontinued, 1967).

20. Public Speaking: A study of the basic principles of expository and persuasive speaking. *(2 hours a week).*

24. Discussion and Debate: A study of the principles and methods of oral communication in small groups, panels and symposiums. *(2 hours a week).*

30. Advanced Public Speaking: Advanced study of the speech designed to affect attitude and beliefs and to induce action. *(2 hours a week).*

32. Parliamentary Procedure: Theory and practice of parliamentary procedure as understood in Canada. Methods of organization, order and conduct of business, etc. *(2 hours a week).*

Honours Courses

220. Public Speaking: A study of the basic principles of expository and persuasive speaking. Laboratory projects and assigned readings. *(2 hours a week).*

330. Advanced Public Speaking: Advanced study of the speech designed to affect attitude and beliefs and to induce action. A survey of rhetorical criticism and a study of the various forms of public address. *(2 hours a week).*

424. Discussion and Debate: A study of the principles and methods of oral communication in small groups, panels and symposiums. Laboratory projects and assigned readings. *(2 hours a week).*

432. Parliamentary Procedure: Theory and practice of parliamentary procedure as understood in Canada, methods of organization, order and conduct of business, etc. Projects and assigned readings. *(2 hours a week).*

ECONOMICS

Officers of Instruction:

Professors: W. G. Phillips, Ph.D. (Head of the Department).
Z. M. Fallenbuchl, Ph.D.

Associate Professor: *A. E. Kovacs, Ph.D.

Assistant Professors: Rev. J. F. Callaghan, C.S.B., M.A.
W. J. Gillen, M.A.
J. C. Strick, Ph.D.
P. R. Burrell, M.A.

Lecturer: R. Kolinski, M.A.

Major requirement: five to seven courses, including 19, 21, 23.

Minor requirement: three to five courses, including 19.

For major in the general course, see p. C-23. Students in third year who have maintained standards acceptable to the department, may be permitted to select one or both of their major options from among the honours courses shown below. A combined major between Economics and Political Science may be arranged with the permission of the departments.

For Honours Economics, see p. C-25; for Honours Economics and Political Science, p. C-26; for Honours Economics and History, p. C-25; for Honours History (Economics option), p. C-31; for Honours Economics and Sociology, p. C-26; for Honours International Relations, p. C-33.

15. Elements of Economics: The development of the market form of economy and the basic principles and policy problems involved. (This course is not meant as an introduction to further study in Economics, and will be accepted as such only on the basis of the student's total performance). *(2 hours a week.)*

19. Introduction to Economic Principles: This course follows the same general lines as Economics 15, but takes the student to a more advanced level of economic theory and analysis. *(3 hours a week.)*

Economics 15 or 19 is prerequisite for all other courses in Economics.

21. Economic Theory: An intensive course in price theory, and some aspects of distribution theory. *(3 hours a week.)*

23. Money and Banking: Theory and policy in financing economic activity. *(3 hours a week.)*

24. Introduction to Statistics: The use of statistical methods in Economics. *(2 lectures, 2 laboratory hours a week.)* (Formerly 34.)

27a. Economic History of Europe. *(3 hours a week, first semester (half course).)*

27b. Economic History of the United States. *(3 hours a week, second semester (half course).)*

31. Public Finance: Theory and policy in government finance. *(3 hours a week.)*

34. Renumbered 24 in 1967.

35. Introduction to Mathematical Economics: The uses and limitations of the mathematical approach in Economics; the mathematical formulation of various static partial equilibrium models in price and income theory; an introduction to dynamic models. (Prerequisite: Math 13). *(3 hours a week.)*

36. Economics of Labour: Problems and policies affecting labour in North America. *(3 hours a week.)*

Honours Courses

Honours courses, assigned at the discretion of the Department Head, may form part or all of the requirements for the first year of the two-year program leading to the degree of Master of Arts.

221. Pricing Theory and Policy: An intermediate course in demand, supply and the pricing process under the various forms of market organization; the nature of profits and the profit-making process; productivity and cost of production; special problems in the theory of monopoly and imperfect competition, with their implications for public policy. An introduction to three-variable analysis is made at the end of the course. *(3 hours a week.)*

223. Money, Banking and National Income: The characteristics and functions of money; the monetary systems and banking organization in Canada, the United States and Great Britain; national income and expenditure; the theory of income, employment, interest and prices; economic growth and fluctuations; monetary and fiscal policy. *(3 hours a week.)*

224. Statistical Methods: The application of statistical methods to economic data: presentation of data; index numbers; frequency distributions; measures of central tendency and deviation; probability; the normal curve; testing of hypotheses; simple linear regression and correlation; trends; seasonal and cyclical variations. *(2 lectures, 2 laboratory hours a week.)* (Formerly 334.)

227a. Economic History of Europe. *(3 hours a week, first semester (half course).)*

227b. Economic History of the United States. *(3 hours a week, second semester (half course).)*

301. International Economics: Theory and empirical foundations of international trade; volume and pattern of trade and capital movements; balance of payments and international monetary relations; balance of payments adjustment process and the foreign exchanges; artificial obstacles to international trade—exchange control, tariffs, quotas; current international economic problems; various regional and world-wide institutions for promotion of currency convertibility and trade; economic development of under-developed areas. *(3 hours a week).*

331. Public Finance: Emphasis is on the use of government finances as a stabilizing device; taxation problems, and the economics of the public debt; Canadian fiscal policies and practices on the provincial and federal levels. *(3 hours a week.)*

334. Renumbered 224 in 1967.

335. Mathematical Economics: The uses and limitations of the mathematical approach in economics; the expression of various aspects of economic theory in mathematical form including consumer and firm behaviour, welfare economics, macro-economic systems (static and dynamic). (Prerequisite: Math 13). *(3 hours a week.)*

336. Economics of Labour: The development and present structure of the labour movement in North America, legislation affecting the status and activities of organized labour; wage and employment problems; methods of dealing with labour disputes; policies and practices in collective bargaining. *(3 hours a week.)*

338. Economic History and Current Economic Policies of Canada: The economic development of Canada from the beginning of settlement to the present day. Current problems and policies in the Canadian economy, including agriculture, transportation, resources and development and anti-trust policy. *(3 hours a week.)*

353. Corporation Finance and Investments: (a) The promotion and financing of business enterprises, financial controls and dividend policies. (b) The principles of investments, individual and institutional; social importance. *(3 hours a week.)*

400. History of Economic Thought: The evolution of economic thought, emphasizing the Classical School. *(2 hours a week.)*

401. Economic Organization and Public Policy: The industrial structure of North America, using price theory as the basis of analysis of selected industries. Emphasis is given to problems of industrial concentration, differentials in scale economics and productivity, commercial policy and control of combines and restrictive trade practices. Some comparative analysis is made of British and European conditions. *(2 hours a week.)*

402. Economic Development: The analysis of economic growth, with emphasis on domestic and international measures for development of underdeveloped countries. *(2 hours a week.)*

404. Introduction to Econometrics: An intensive examination of some problems encountered in the use of statistical inference in testing economic theories, including errors in variables, autocorrelation, multicollinearity, lagged variables, and identification. (Prerequisite: Economics 224). *(2 lectures, 2 laboratory hours a week.)*

406. Advanced Macroeconomics: A study of long and short run economic fluctuations, with emphasis on current stabilizing policies. *(2 hours a week.)*

410. Advanced Micro-Economics: Selected theories of value, production, distribution and welfare. *(2 hours a week.)*

432. The Soviet Type Economies: The communist economic theory, institutions and policies as applied in the U.S.S.R. and Soviet-dominated countries. *(2 hours a week.)*

ENGLISH

Officers of Instruction:

Professors: Rev. C. P. J. Crowley, C.S.B., Ph.D.
*J. F. Sullivan, Ph.D.
R. Huang, Ph.D.

Associate Professors: E. J. McNamara, Ph.D.
E. D. LeMire, Ph.D.
R. J. Smith, Ph.D. (Acting Head of the Department).
Mrs. J. C. Smith, M.A.

Assistant Professors: Rev. E. C. Pappert, C.S.B., Ph.D.
H. F. Plante, M.A.
L. K. Smedick, Ph.D.
D. M. Schwegel, Ph.D.
P. W. London, Ph.D.
M. Speigel, Ph.D.
K. O'Donnell, Ph.D.
S. S. Stollman, Ph.D.
E. A. Watson, M.A.
J. M. Ditsky, Ph.D.

Lecturers: *D. M. Holmes, M.A.
W. I. Romanow, M.A. (Part-time).
N. Brightmore, M.A.

*On leave.

For major in general course, see p. C-23; for Honours Drama and English, p. C-24; for Honours English Language and Literature, p. C-27; for Honours English and French, p. C-27; for Honours English and History, p. C-28; for Honours English and Philosophy, p. C-29; for Honours English and Spanish, p. C-29; for Honours English and Latin, p. C-28; for Honours Philosophy and Latin (English option), p. C-35.

Options and Cognate Sequences for English Majors: In general, English majors will choose options or minor sequences from the course offerings of the following departments: Classics, Fine Arts, History, Modern Languages, Philosophy, Psychology, Theology, and Sociology and Anthropology.

In particular, the following courses or course sequences are recommended:

Latin 12, Latin 22 (222), Latin 31, Latin 332, Latin 25 (225), Fine Art 24, Fine Art 34, Drama 10, History 24 (324).

Required and Optional English Courses:

English 15 or special permission is a pre-requisite to all other English courses.

English majors are required to take five to seven General or Honours courses which must include English 15, 20 and 30 in that sequence (except for Extension students).

English minors are required to take three to five General or Honours courses, which must include English 15. If as many as five courses are taken, English 20 and English 30 must be included.

The English Honours Program:

All students in Honours English Language and Literature are required to take English 200y in their **second** year.

All students in English Honours are required to take English 499y in their **fourth** year.

Honours English Language and Literature students are required to take ten to twelve Honours-level courses. The first ten must satisfy the group requirements as outlined below; the eleventh and twelfth courses, if taken in English, may be chosen from **any** Honours-level courses not already taken.

Not all English courses will be offered in every year. Students should consult the Department in advance of registration to determine the available courses.

Although courses are numbered sequentially, students may take them in any year.

Group I (**One** course required): 480.

Group II (**One** course required): 363, 463, 464.

Group III (**Two** courses required; at least one of the first two must be taken): 450, 451, 235, 356.

Group IV (**One** course required; to be taken from the first two): 250, 370, 236, 260.

Group V (**One** course required; to be taken from the first two): 350, 460, 261, 237.

Group VI (**Two** courses required; at least one of the first two must be taken): 461, 459, 338, 270.

Group VII (**One** course required): 339, 337.

Group VIII (**No** course required): 340, 341, 441y, 201y.

5. General Literature and Composition: (Prerequisite: Grade 12 English). *(4 hours a week.)*

15. Introduction to Literature: The short story, the novel, poetry and drama. Many papers of varying lengths will be required. *(3 lectures a week.)*

20. Major British Writers, Chaucer to Boswell: Extensive reading in the major works of Chaucer, Spenser, Bacon, Donne, Milton, Dryden, Swift, Pope, Johnson, and Boswell. Required of all English majors. *(3 hours a week.)*

21. Selected Literature and Composition: A reading of selected literature designed to acquaint the student with ideas and values significant in Western culture; the development of writing skills through the practice of prose composition. (May not be substituted in an English major program). *(3 hours a week.)*

24. Comparative Literature: Selected readings from European literature in English translation; comparative study of themes and forms in relation to English literature. Limitations of the study will be established by the professor. *(3 hours a week.)*

25. Shakespeare: Tragedies, Comedies, and Histories. Shakespearean criticism. *(3 hours a week.)*

26. Modern Drama: A study of major developments in modern British and American drama and of continental influences. *(3 hours a week.)*

27. Canadian Literature: The literature of Canada in English from the beginning to the present day. *(3 hours a week.)*

30. Major British Writers: Wordsworth to Eliot: Extensive reading in the major works of Wordsworth, Coleridge, Byron, Shelley, Keats, Tennyson, Browning, Arnold, Shaw, Yeats, and Eliot. Required of all English majors. *(3 hours a week.)*

31. The Critical Reading of Selected English, American, and Continental Fiction: The modes of narrative fiction. Emphasis on the development of the novel. *(3 hours a week.)*

32. Nineteenth Century Thought: Problems and issues of the nineteenth century in their literary expression. *(3 hours a week.)*

33y. Creative Writing: Limited to fifteen students. Those wishing to register in the course should submit manuscripts to the Department of English before September 1. (May not be substituted in an English major program without special permission of the Head of the Department.) *(1 hour a week; half course).*

38. American Literature: The literature of the United States from the beginnings to the present day. *(3 hours a week.)*

39. Recent Literature in English: Poetry and fiction of England and the United States. *(3 hours a week.)*

Honours Courses

Comprehensive examinations will be held at the end of the Fourth Year in all courses in English Honours.

Honours courses, assigned at the discretion of the Department Head, may form part or all of the requirements for the first year of the two-year program leading to the degree of Master of Arts.

200y. Practical Criticism: Close analysis of poetic and prose texts, emphasizing contemporary approaches in literary criticism. Many short papers. Required of all second-year students in English Honours. *(2 hours a week; half course.)*

201y. Advanced Expository Rhetoric: The purpose is to increase the writer's control of language through close attention to the processes of invention, the varieties of structures, and the principal devices that determine tone. The course is designed for the widest possible audience of advanced students (in all departments) who wish to improve their mastery of language. Students from other departments are particularly invited. *(1 to 2 hours a week; half course.)*

235. Shakespeare: A study of the works of Shakespeare, with major emphasis to be placed on his drama. *(3 hours a week.)*

236. English Drama: 1660-1880. Concentration on the dramatists of the Restoration and early eighteenth century (Dryden, Etheredge, Congreve, Farquhar, and Fielding), but also discussing later eighteenth century, Romantic and Victorian drama. *(3 hours a week.)*

237. Modern English and American Drama: A study of the drama of England and the United States from 1880 to the present day. *(3 hours a week.)*

250. Restoration and Eighteenth Century Literature: Literature from 1660 to 1800, with emphasis upon Dryden, Swift, Pope, Johnson, and the major novelists of the era. *(3 hours a week.)*

260. Criticism in English from Plato to Samuel Johnson: Major works and ideas in the literary criticism of the Classical, Mediaeval, Renaissance and neo-Classical periods. Some critical practice. *(3 hours a week.)*

261. Criticism in English from Coleridge to the Present: Major works and ideas in the literary criticism of the Romantic, Victorian, Transitional and Modern Periods. Some critical practice. *(3 hours a week.)*

270. The Rise and Development of the English Novel: A study of the novel in England from Defoe to the present day. *(3 hours a week.)*

337. Canadian Literature: The literature of Canada in English from the beginning to the present day. *(3 hours a week.)*

338. American Literature to 1865: A study of the literature of the United States from Puritan times to the American Renaissance, including the works of Poe, Emerson, Thoreau, Whitman and Melville. *(3 hours a week.)*

339. American Literature since 1865: A study of the literature of the United States from Twain and James to the present day. *(3 hours a week.)*

340. Comparative Literature: The study of related texts from the literatures of different countries or periods, with emphasis on the English literature of the particular period under study. (The particular texts, periods and literatures will vary from year to year.) The works in languages other than English will be regularly read in their original language. *(3 hours a week.)*

341. Literature in Translation: The study of a particular period or type to vary from year to year; English texts will be included. Some attention will be paid to the relevance for or influence upon English literature. *(3 hours a week.)*

350. Literature of the Romantic Era: Emphasis on the major poetry from Blake to Keats. *(3 hours a week.)*

356. English Drama from Its Mediaeval Origins to 1642: Study of the traditions and development of English drama before 1642, the emphasis falling upon the years 1580-1620. Attention to be paid to matters of stages and staging. Some of Shakespeare's plays will be included, but a prior knowledge of more will be assumed. *(3 hours a week.)*

363. Old English Literature: The study of Old English literature in its original language, with concentration upon the poetry of the heroic tradition. *(3 hours a week.)*

370. Milton: Concentration on the major poems, but the minor poems and some of the prose works will be examined. *(3 hours a week.)*

441y. Advanced Creative Writing: Permission of the Department is required; no student may take this course to fulfill the minimum requirement of his program. *(2 hours a week; half course.)*

450. Sixteenth Century English Literature: A study of the major genres, figures and literary trends and ideas, concentrating on More, Spenser, Sidney, Marlowe and the early Shakespeare. *(3 hours a week.)*

451. English Literature, 1600-1660 (including Milton): A study of the major genres, figures, and literary trends and ideas, concentration on Bacon, Donne, the later Shakespeare, Ben Jonson, and Milton. *(3 hours a week.)*

459. Modern English and American Literature: A study of the literature of England and the United States from Eliot, Pound and Joyce to the present day. *(3 hours a week.)*

460. English Literature of the Mid-Nineteenth Century, 1830-1880: Victorian prose, poetry, and drama from Macaulay to the Aesthetic Movement. *(3 hours a week.)*

461. Literature in Transition, 1880-1920: Prose, poetry, and drama in English from the Aesthetic Movement to Joyce, Eliot, Pound and Yeats. *(3 hours a week.)*

463. Mediaeval Literature other than Chaucer: Chiefly Middle English literature, excluding Chaucer, concentrating upon the works of the "alliterative revival" (*Piers Plowman*, the works of the *Pearl*-poet) **or** upon the development of early English prose. *(3 hours a week.)*

464. Chaucer: A study of the works of Chaucer (in Middle English), relating his achievement to English and Continental literature of the later Middle Ages. *(3 hours a week.)*

470y. English Tutorial: Studies in English language and literature, directed by members of the department. *(1 hour a week; half course).*

480. History of the English Language: An introduction to the scientific study of language through an examination of English from its origin to the present day. *(3 hours a week.)* (Formerly English 499b.)

499a. Renumbered 499y in 1967.

499b. Renumbered 480 in 1967.

499y. Scholarship and Bibliography: Training in the methods and materials of scholarship in English literature. Required of all fourth year students in English Honours. *(1 hour a week, half course.)* (Formerly English 499a.)

FINE ART

Officers of Instruction:

Professor: J. N. DeLauro, M.F.A.

Lecturer: E. J. Yerex, M.F.A.

Instructor: E. G. McLean, M.A.

For major in general course, see p. C-23; for B.F.A. Honours, p. C-43.

Major: five to seven courses, including Fine Art 10, 24, 34 and at least 2 *of:* 20, 23, 30, 32, 33.

Minor: three to five courses, including Fine Art 10 and a sequence of at least 2 others.

Options: Fine Art 10, 23, 24 or 34.

10. Introduction to Drawing: Experimenting with various media and techniques. Subject matter: still life, landscape and nature study; individual and studio criticism. *(2 lectures, 2 laboratory hours a week.)*

20. Drawing and Design: Second Year. Introduction to life drawing with emphasis on anatomy and construction and the importance of the figure to design; individual and studio criticism. *(4 hours a week.)*

23. Introduction to Sculpture: Introduction to modelling, carving and casting in plaster; individual and studio criticism. (No previous experience required). *(2 lectures, 2 laboratory hours a week.)*

24. History of Art: History of art from prehistoric to mediaeval art with an introduction to composition and the language of the plastic arts and relationships to its culture. *(3 hours a week.)*

30. Beginning Oil Painting: Fundamentals of painting, with an introduction to the language of form and color; painting from life, still life, and imagination. (Prerequisite: Fine Art 10 or consent of instructor). *(4 hours a week.)*

32. Graphics: The technique of etching, engraving, wood engraving, wood cut, and dry point. (Prerequisite: Fine Art 10). *(2 lectures, 2 laboratory hours a week.)*

33. Sculpture and Design: Second Year. Emphasis on design and its relation to different media, also the investigation into theory and practice of sculpture in our society; individual and studio criticism. *(4 hours a week.)*

34. History of Art: From Italian renaissance to twentieth century art with emphasis on the influence of social and philosophical ideas on the arts. *(3 hours a week.)*

Honours Courses

220. Drawing and Design: Emphasizing the uses of the human figure as a means of design and expression and experimentation with different mediums. *(2 lectures, 2 laboratory hours a week.)*

224. History of Art: History of Art prehistoric to mediaeval with an introduction to composition and the language of the plastic arts in relationship to its culture. *(3 hours a week.)*

230. Beginning Oil Painting: Open to students who have had one year of drawing. Primarily creative oil painting and acrylic techniques, problems in fresco and tempera and gold leaf. *(2 lectures, 2 laboratory hours a week.)*

233. Sculpture and Design: Emphasis on design and its relation to different mediums, also the investigation into theory and practice of sculpture in our society; individual and studio criticism. *(2 lectures, 2 laboratory hours a week.)*

330. Advanced Painting: The course is to give the student an opportunity to experiment with the following mediums: oil painting, acrylic fresco and tempera. Problems will be given in each of the techniques so as to master the technique more fully. *(1 lecture, 6 laboratory hours a week.)*

332. Graphics: Open to students who have had one year of drawing. Creative problems in theory and technique. Problems in etching and engraving on zinc or copper and intaglio method. *(2 lectures, 2 laboratory hours a week.)*

333. Advanced Sculpture: The continuation of sculpture and design (233) with the emphasis on experimenting with different mediums such as plastics and metal, bronze, etc. *(1 lecture, 6 laboratory hours a week.)*

334. History of Art: Mediaeval Art to the 20th Century with emphasis on the influence of social and philosophical ideas on the arts. *(3 hours a week.)*

434. Contemporary Art: Present day expression and designs in architecture, painting and sculpture using texts, magazines and slides to aid in evaluation of contemporary art. *(2 hours a week.)*

436y. Criticism: The principles of criticism of the past and present. *(1 hour a week, half course.)*

437y. Seminar: This is open to students who are majoring in Fine Arts and are competent in discussing aesthetic problems that can be discussed openly and to help find the authenticity and value of artistic expression. *(1 hour a week, half course.)*

440. Thesis and Practical Work: Painting: The advanced student is given free range to experiment in his choice of medium and to synthesize his previous knowledge and experience with personal criticism from his instructor in order to assess his ability. *(12 laboratory hours a week.)*

441. Thesis and Practical Work: Sculpture: The advanced student is given free range to experiment in his chosen medium and to synthesize his previous knowledge and experience, with personal criticism from his instructor in order to assess his ability. *(12 laboratory hours a week.)*

442. Thesis and Practical Work: Graphics: The advanced student is given free range to experiment in his chosen medium and to synthesize his previous knowledge and experience, with personal criticism from his instructor in order to assess his ability. *(12 laboratory hours a week.)*

FRENCH

(See p. C-97.)

GEOGRAPHY

Officers of Instruction:

Professor: J. C. Ransome, Ph.D. (Head of the Department).
Assistant Professors: P. E. Vandall, M.A.
A. Blackbourn, M.A.
Mrs. Marie Sanderson, Ph.D.

Major requirements: from five to seven courses, including Geography 10.
Minor requirements: from three to five courses, including Geography 10.

For major in general program, see p. C-23; for Honours Geography, see p. C-31.

10. Elements of Geography: An introduction to the study of landforms, weather, climate, soils, natural vegetation, water resources, population density and distribution, economic location and urban problems. *(2 lectures and 2 hours practical work a week.)*

23. Economic Geography: A study of the distribution of economic activity in the world. *(3 hours a week.)*

24. World Regional Geography: (Prerequisite: Geography 10 or consent of the Department). *(3 hours a week.)*

25. Geomorphology: The study of landforms. (Prerequisite: Geography 10 or consent of the Department). *(2 lectures, 2 hours practical work a week.)*

32. Climatology: An analysis of weather changes and climate types. (Prerequisite: Geography 10 or consent of the Department). *(2 lectures and 2 hours practical work a week.)*

34. Geography of North America: A systematic and regional analysis of its physical and cultural elements. (Prerequisite: Geography 10 or consent of the Department). *(3 hours a week.)*

35. Cartography: A systematic and practical study of the art of representing geographical data on maps, charts, graphs and block diagrams. (Prerequisite: Geography 10 or consent of the Department). *(2 lectures, 2 hours practical work a week.)*

36. Quantitative Geography: An introduction to the use of quantitative methods in the analysis of geographical data. (Prerequisite: Geography 10 or consent of the Department, and one other Geography). *(3 hours a week.)*

37. Urban Geography: A survey of the geographical characteristics of urban communities. (Prerequisite: Geography 10 or consent of the Department, and one other Geography). *(3 hours a week.)*

38. Latin America: A regional analysis of the human geography of South America, Mexico, Central America, and West Indies. Regional resources, sequent occupance, and the economic development will be compared from place to place. *(2 lectures, 1 hour seminar a week).* (Offered in Extension only, 1967-68).

Honours Courses

223. Economic Geography: A study of the distribution of economic activity throughout the world, locational theories, factors influencing the distribution of selected industries and characteristics of industrial regions. *(3 hours a week.)*

224. World Regional Geography: A systematic survey of selected natural, economic and political regions of the world. (Prerequisite: Geography 10 or consent of the Department). *(3 hours a week.)*

225. Geomorphology: The study of landforms, including an analysis of their origins, stages of growth, classifications and effects on land-use. *(2 lectures, 2 hours practical work a week.)*

332. Climatology: The analysis of atmospheric disturbances and their distribution, climate controls, climate classifications and climate changes. *(2 lectures, 2 hours practical work a week.)*

334. Geography of Canada: A systematic study of its physical and human resources, including an analysis of selected problems dealing with economic development, rapid urbanization, foreign trade, resource conservation and regional planning. *(3 hours a week.)*

335. Cartography: A systematic and practical study of the art of representing geographical data on maps, charts, graphs and block diagrams. Local field study and air photo interpretation will be included. *(2 lectures, 2 hours practical work a week.)*

336. Quantitative Geography: An introduction to the use of quantitative methods in the analysis of geographical data; especially with regard to spatial distributions, associations, densities and flows. *(3 hours a week.)*

337. Urban Geography: A study of the nature, origin, growth and world distribution of urban communities; especially with regard to their changing functions and structures. The effects of different situations and sites will be considered, as well as the problems of annexation, urban renewal and effective land-use planning. The importance of hinterlands and the rise of regional administrative units with special reference to Canada will be considered also. *(3 hours a week.)*

433. Political Geography: A survey of the effects of locational factors on political relations. Geopolitical theories and principles will be analysed and studies made of selected political problems on both national and international levels. *(2 hours a week.)*

438. Latin America: A regional analysis of the human geography of South America, Mexico, Central America, and West Indies. Regional resources, sequent occupance, and the economic development will be compared from place to place. *(2 lectures, 1 hour seminar a week.)* (Offered in Extension only, 1967-68).

444. Geography of Europe: A systematic and regional analysis of Europe's geographical elements. Its historical geography and political and economic development will be especially considered. *(2 hours a week.)*

446. Geography Research Problems: Each student will be required to carry out a research project and write a report under the supervision of a staff member. It will involve bibliographical research, field work, cartographical representation of findings, etc. (Equivalent to a full course).

447. Selected Problems in Eastern Europe and Asia. *(3 lectures a week.)*

GEOLOGY

Associate Professor: P. Sonnenfeld, D.Rerum Nat.

Lecturer: Rev. A. J. Weiler, C.S.B., B.A.

Major requirements: Geology 10 or 11, and 4 to 6 others in the 20's or 30's.

Minor requirements: Geology 10 or 11, and 2 to 4 others in the 20's or 30's.
For major in general program, see p. C-45.

10. Introductory Course in Geology: Minerals and rocks, geological processes and their results; structure of the earth; practical application of geology; fossils and their use; an outline of the earth's history. *(2 lectures and 2 laboratory hours a week. Field trips.)*

10e. Renumbered 11 in 1967.

11. Introductory Geology for Engineers: Minerals, rocks, and their properties; soils, construction materials, geological processes and their results; fossils and their use; an outline of the earth's history. *(2 lectures, 1 laboratory hour a week, field trips).* (Formerly 10e).

20. Mineralogy: An elementary course in mineralogy and crystallography. The study and identification of rocks and minerals according to their physical and chemical properties. (Prerequisite: Grade 13 Chemistry or equivalent). *(2 lectures, 2 laboratory hours a week.)*

22. Paleontology: Morphology, evolution and geological record of life in the past. Principles underlying the use of fossils in correlation. *(2 lectures, 3 laboratory hours a week.)* (Prerequisite: Zoology 10 or equivalent).

23a. Historical Geology: Concept of time in Geology. Sequence of major events in the history of the earth and its life. Paleogeography with emphasis on North America. *(2 lectures, 2 laboratory hours a week; one semester; half course.)*

24b. Regional Geology of Canada: Historical and stratigraphic geology of Canada, major structural features, morphology and mineral deposits. *(2 lectures, 2 laboratory hours a week; one semester; half course.)*

25. Geomorphology: The study of landforms. (Prerequisite: Geography 10 or consent of the Department). *(2 lectures, 2 hours practical work a week.)*

36. Structural Geology: Nature of rock structures, mechanics of rock deformation, study of selected structural problems. *(2 lectures, 3 laboratory hours a week.)* (Not offered 1967-68).

37. Igneous and Metamorphic Petrology: Classification, fabric and origin of rocks. Optical properties of rock forming minerals. Applications of experimental petrology. *(2 lectures, 3 laboratory hours a week.)* (Prerequisite: Geology 20). (Not offered 1967-68).

38. Sedimentary Petrology: Genetic interpretation of sedimentary rocks. Patterns of deposition and diagenesis. Introduction to sedimentary mineralogy, lithofacies analysis and physics of sedimentation. *(2 lectures, 3 laboratory hours a week.)* (Not offered 1967-68). (Prerequisite: Geology 20).

GERMAN

(See p. C-99).

GREEK

(See p. C-69).

HISTORY

Officers of Instruction:

Professors: *Rev. D. J. Mulvihill, C.S.B., Ph.D. (Head of the Department).
Rev. F. J. Boland, C.S.B., Ph.D.
Rev. J. P. O'Meara, C.S.B., Ph.D.
F. A. Walker, Ph.D.

Associate Professors: M. N. Vuckovic, Ph.D. (Acting Head)
J. K. Farrell, Ph.D.
K. G. Pryke, Ph.D.
Br. Bonaventure Miner, Ph.D.

Assistant Professors: Rev. H. G. Hill, O.G.S., M.A.
A. I. Mouratides, Ph.D.
Mrs. S. S. Walker, Ph.D.

Lecturers: G. A. McMahon, M.A. (Part-time)
R. G. Hoskins, M.A.

*On leave.

For Holy Redeemer College: Associate Professor: Rev. D. L. Egan, C.Ss.R., S.T.L.

Major requirements: five to seven courses, including 10 and 25.

Minor requirements: three to five courses, including 10 and 25.

For major in general course, see p. C-23; for Honours History (Economics option), see p. C-31; for Honours English and History, p. C-28; for Honours History (Philosophy option), p. C-32; for Honours Economics and History, p. C-25; for Honours History and Theology, p. C-32; for Honours Political Science and History, p. C-37; for Honours International Relations, p. C-33.

4. History of the Americas: A study of the rise and growth of the various American nations and their relations with one another, against their respective geographical, economic and cultural backgrounds. (Offered at Holy Redeemer College only). *(3 hours a week.)*

10. Mediaeval, Renaissance and Reformation History. *(3 hours a week.)*

11. The Development of Christian Civilization: A survey of the development of Christian civilization and thought from the time of Christ to the present, with special attention to the role of the Church. (Offered at Holy Redeemer College only). *(2 hours a week.)* (Discontinued, 1967).

22. History of Canada: A survey from the beginning of the French Regime to the present. *(3 hours a week.)*

24. History of England: A lecture and reading course of the political and cultural development of England from the Tudor times to the present. *(3 hours a week.)*

25. Modern History (1555-1933). *(3 hours a week.)*

26. Western Civilization and Thought: From the fall of the Roman Empire to the end of World War II. This is a survey course for those not majoring in history; because of similarity of content, students who have credit for History 10, 11 or 25 may not take this subject for credit. This is a special purpose course, not fulfilling requirements of an Arts major in History or as an elective of an Arts student. *(2 hours a week.)*

27. Ancient Civilizations: The Near East, Greece and Rome. *(3 hours a week, lectures and seminars.)*

30. The Canadian Political Tradition - 1867 to Present: A study of the development of political thought and political parties in Canada. *(3 hours a week.)*

32. British North America 1815-1867: A regional and social approach. (Prerequisite: History 22 or permission of the Department). *(3 hours a week.)*

34. History of the United States. *(2 hours a week.)*

35. History of Latin America: The colonial and republican periods; the cultural, institutional and political development of the Latin countries of the western hemisphere. *(3 hours a week.)*

37. History of Russia: Origins to the fall of the Monarchy. (Prerequisite: History 25 or permission of the Department). *(3 hours a week.)*

38. Diplomatic History of the United States: From 1790 to the present. (Prerequisite: History 34 or permission of the Department). *(3 hours a week.)*

Honours Courses

Honours courses, assigned at the direction of the Department Head, may form part or all of the requirements for the first year of the two-year program leading to the degree of Master of Arts.

222. History of Canada: A survey from the beginning of the French Regime to the present. *(3 lectures and a seminar a week.)*

225. Modern History (1555-1933). *(3 hours a week, lectures and seminars.)*

257. Ancient Civilizations: Prehistoric culture from the Paleolithic Age to the dawn of civilization. The political, social, economic and cultural history of the Near East and Egypt. The origin, development, achievement and decay of the Greek city-state from the time of Homer to Alexander the Great, with particular emphasis on Greek culture and Greek contributions to modern civilization. The political and social development of the Roman state from its origins to the Augustan age with a particular attention paid to the collapse of the Republic and the Principate. *(3 hours a week.)*

324. History of England: The political, social and cultural development of England from the Tudor times to the present. *(3 hours a week, lectures and seminars.)*

330. The Canadian Political Tradition - 1867 to Present: A study of the development of political thought and political parties in Canada. *(3 hours a week.)*

331. Nature and History of the Church: Nature and structure of the Church in the light of the history of the ecclesiology and Vatican Councils I and II. A study of the evolution of the Church of Christ through its major historical developments such as the Roman persecutions, the major heresies, the eastern schism, the protestant reformation, the French revolution and modern secularism. *(3 hours a week.)* This course is offered by the Department of Theology.

332. British North America 1815-1867: A regional and social approach. *(3 hours a week.)*

333. History of the British Commonwealth: A study in the development of the British Empire from the period of Tudor expansion to the events of the modern British Commonwealth. *(3 hours a week.)*

334. History of the United States: The colonial period, the revolution, making of the constitution, westward development, the slavery struggle, the Civil War, reconstruction and later political history to the present day; the character of federal and state governments. *(3 hours a week, lectures and seminars.)*

335. History of Latin America: The colonial and republican periods; the cultural, institutional and political development of the Latin countries of the western hemisphere. *(3 hours a week.)*

337. History of Russia: Origin to the Fall of Monarchy: (i) The political and economic growth, cultural and religious factors, the growth of foreign relations and the expansion of the State until the 19th Century. (ii) The history of Russia from the beginning of the 19th Century to the Fall of the Monarchy, with special emphasis on the development of the revolutionary movement in Russia. (Prerequisite: History 25 or 225 or permission of the Department). *(3 hours a week, lectures and seminars.)*

340. History of the Early Church to 500 A.D.: The development of the Church as an institution from the post-apostolic era until the sixth century. Special attention will be paid to the relationship of the Church to the pagan and Christian Empires, the development of Christian institutions with particular reference to the first four Ecumenical Councils and Christian life and thought. The course emphasizes use of documents. *(3 hours a week, lectures and seminars.)*

353. Social and Constitutional History of England: The social and constitutional history of England to 1688, emphasizing the use of documents. Recommended for pre-law and political science students. *(3 hours a week, lectures and seminars.)*

425. History of European Diplomacy 1815 to Present: (i) Diplomacy in theory and practice; (ii) History of British Foreign Policy in Europe, 1815-1914; (iii) International relations and world problems in the 20th Century. (Prerequisite: History 25 or 225 or permission of the Department). *(3 hours a week, lectures and seminars.)*

438. Diplomatic History of the United States: The diplomatic aspect of the War for Independence; American international relations after 1789; occupation of the West; international aspects of the Civil War; American Imperialism; Spanish-American War; First World War; League of Nations; Caribbean and Pacific problems since 1920; foreign policy since 1933; Second World War; post-war problems and the United Nations. (Prerequisite: History 34 or 334 or permission of the Department). *(3 lectures and seminar.)*

439. History of U.S.S.R.: Revolutionary trends of the 19th and early 20th centuries; Marxian and non-Marxian roots of the Revolution; the February and October Revolutions and the Civil War; doctrinal foundations of the new order and subsequent ideological changes; economic and political structure; international relations and foreign policy. (Prerequisite: History 25 or 37 or 225 or 337, or permission of the Department. *(3 hours a week, lectures and seminars.)*

452. Mediaeval Institutions: Mediaeval institutions relating to continental Europe from the fall of the Roman Empire to the late Middle Ages with extensive use of documents. *(3 hours a week, lectures and seminars.)*

455. British Political Parties: The rise of the Tory, Whig, Conservative, Liberal, Irish Parliamentary, Unionist and Labour Parties. *(3 hours a week, lectures and seminars.)*

458. Canada - Autonomous State – 1867 to Present: Macdonald, Laurier, to Canada's *emergence as a nation and its responsibilities. (3 hours a week, lectures and seminars.)*

461. Canadian-American Relations, 1785 to 1962: Special emphasis on Post World War II economic, defence and cultural interests. *(3 hours a week.)*

HOME ECONOMICS

Officers of Instruction:

Assistant Professors: Sr. Mary Romana, S.N.J.M., M.S.

Sessional Lecturer: Mrs. J. Stager, M.S.

Major requirements: five to seven courses, including 10, 25, 27, 31; 37 or 30.

Minor requirements: three to five courses, including 10, 27, 31.

For major in general course, see p. C-23.

10. Textiles and Clothing: The study of fundamental clothing construction. A general knowledge of textile fibres, their classification, identification and construction in relation to clothing study. *(2 lectures, 3 laboratory hours a week.)*

25a. Home Management: A study of homemaking with special emphasis on the budgeting of time, energy and income; fundamental principles and management involved in the use, care and maintenance of household equipment. *(3 hours a week, one semester; half course.)*

25b. Family Relations: A study of the position of woman in the home; a positive program for family problems and their solution in the light of Christian teaching. *(3 hours a week, one semester; half course.)*

27. Foods: An elementary study of the selection and preparation of foods; standards for food preparation; practical experience in menu making, food costs, nutritive evaluation, meal preparation, time management and table service for formal and informal meals in the home. *(2 lectures, 2 laboratory hours a week.)*

30. Study of Commercial Patterns and Tailoring: An approach to clothing construction by the use of commercial patterns. This course offers training in dressmaking tailoring. It gives details in cutting and assembling garments. Clothing construction may be applied to jackets, suits, and coats either from one's own individual pattern or from a commercial pattern. *(2 lectures, 3 laboratory hours a week.)*

31. Nutrition: Study of the nutritional requirements of the body at different age levels with particular emphasis on their importance to health and prevention of disease; study of the present-day requirements of children, developing satisfactory food habits, causes and recognition of deficiency diseases. Seminar required (see below). (Prerequisite: Home Economics 27, Biology 11 or equivalent). *(3 lectures a week.)*

37. Experimental Cookery: A study of the effects of varying procedures, ingredients and equipment on various food products with emphasis on the methods which will best conserve nutriment, flavor and appearance. Seminar required (see below). (Prerequisite: Home Economics 27). *(2 lectures, 3 laboratory hours a week.)*

Seminar: A study of current findings and problems, assigned readings, and discussion of current literature; field trips. Seminar is required of all students taking Home Economics 31 and 37.

ITALIAN

(See p. C-100).

LATIN

(See p. C-69).

LIBRARY SCIENCE

Use of Books and Libraries: A general course designed to make all students familiar with the classification of the library; to enable them to read a book technically; to use the dictionary catalogue and to interpret catalogue cards; to acquaint them with the basic reference tools which they will need to use during their college years. Seven lectures. (Required of all students entering the University in Preliminary or First Year.)

MATHEMATICS

Officers of Instruction:

Professors: Rev. D. T. Faught, C.S.B., M.A. (Head of the Department).
H. A. Eliopoulos, Ph.D.
E. Zakon, Dr.Jur.
F. Rothberger, Ph.D.

Associate Professors: Rev. W. F. Nigh, C.S.B., M.A.
A. C. Smith, Ph.D.
D. S. Tracy, Sc.D.
K. A. Zischka, D.Sc.

Assistant Professors: H. R. Atkinson, Ph.D.
J. G. Laframboise, Ph.D.
S. P. Singh, Ph.D.

Sessional Instructors: C. Kassimatis, Ph.D.
F. K. Schnitzer, Ph.D.
M. P. Closs, M.Sc.
R. J. Flynn, M.Sc.
D. Teodoro, M.A.

Major requirements — B. A.: six or seven courses, including 11ab, 12b, 15, 20a, 25, 30; 32 or 37

B.Sc.: six or seven courses, including 11ab, 15, 20a, 25, 27b.

Minor requirements — EITHER (if admitted with Math A): 11ab and 13; and at least one full course from 12b, 20a, 29a, 37 or 32.

OR (if admitted with Math AB): 11ab and 15; and at least one full course from 12b, 20a, 22, 25.

For major in general science course, see p. C-45; for major in general arts course, p. C-23; for Honours Mathematics, B.Sc., p. C-49; B.A., p. C-34; for Honours Philosophy and Mathematics, p. C-36.

1. Elements of Analysis: Functions, conics, circular functions, plane transformations, sequences and limits, differentiation of algebraic and transcendental functions, integration and area. *(3 hours a week.)*

2. Algebra: Set theory, arrangements and subsets, binomial theorem, induction, vector algebra, equations of lines and planes, matrices, complex numbers, polar coordinates, groups. (Corequisite: Math 1). *(3 hours a week.)*

1y. Algebra: Functions and their graphs, quadratic equations, ratio and proportion, variation, progressions, interest and annuities, permutations and combinations, binomial theorem, mathematical induction, determinants, complex numbers and sequences. *(2 hours a week (half course).)* (Discontinued, 1967).

2y. Analytic Geometry: The point, straight line, circle, parabola, ellipse, hyperbola, translation and rotation of axes, general second-degree equations, polar coordinates, parametric equations, determinants of the third order. *(2 hours a week (half course).)* (Discontinued, 1967).

3y. Plane Trigonometry: Fundamental formulae, graphical representation of trigonometric functions, solution of trigonometric equations, solution of triangles, logarithms, complex numbers, De Moivres theorem. *(2 hours a week (half course).)* (Discontinued, 1967).

4a. Introductory Mathematics I: Sets, relations, functions and numbers. *(3 hours a week; one semester; half course.)*

4b. Introductory Mathematics II: Limits, continuity, derivatives, integration. *(3 hours a week; one semester; half course.)*

11. General Mathematics: Vector algebra, solid analytical geometry, determinants, matrices, sets, linear programming, polar coordinates, parametric equations, complex numbers, transcendental functions, induction, curve tracing, the general quadratic equation. (Prerequisite: Mathematics 1y, 2y, 3y, or Grade 13 Algebra, Geometry, Trigonometry.) *(2 lectures, 2 tutorial hours a week.)* (Discontinued, 1967).

11a. General Mathematics I: Vector algebra, solid analytic geometry, determinants, matrices, polynomial equations with real coefficients, general quadratic equation, surfaces in E^3 in standard form, complex numbers, induction, transcendental functions. (Prerequisites: Math AB of Grade 13, or Math 1 and 2, or Math 13). *(2 lectures, 2 tutorial hours a week, one semester; half course.)*

11b. General Mathematics II: Set algebra with use of quantifiers and indexed sets, relations and mappings, ordered fields, inductive proofs and definitions, geometry of n dimensions, the complex field, axiomatic method. (Prerequisite: Mathematics 11a). *(2 lectures, 2 tutorial hours a week, one semester; half course.)*

12b. Linear Algebra: System of linear equations, quadratic forms, eigenvalue problems diagonalization, finite dimensional vector spaces, linear transformations. *(2 lectures, 2 tutorial hours a week, one semester; half course.)*

13. Calculus and Linear Algebra: Derivatives and integrals of algebraic and transcendental functions, optimization problems, area, partial derivatives, vectors and matrices, systems of equations, linear programming, regression analysis, quadratic forms. (Prerequisite: Math A of Grade 13, or Math 4ab.) *(3 hours a week.)*

15. Differential and Integral Calculus: Limits, differentiation of algebraic and transcendental functions, definite and indefinite integration, partial differentiation, area, volume, approximate integration and indeterminate forms. (Prerequisite: Math AB of Grade 13, or Math 1 and 2.) *(3 hours a week.)*

20a. Computer Programming: Basic logic in programming; symbolic languages; Fortran language; data processing. Students will practice to analyze problems, to use flow charts, to write programs and to use a digital computer in the laboratory hours. (Prerequisite: none). *(3 lectures, 2 laboratory hours a week, one semester; half course.)*

21. Fundamental Concepts of Mathematics: Sources and evaluation of mathematical ideas and methods, sets, algebraic structures, number systems, relations to logic, axiomatic method, the infinite, present-day situation in the foundations. *(3 hours a week.)*

22. Renumbered 30 in 1967.

23. Mathematical Analysis for the Social Sciences: Elements of algebraic and transcendental functions, introductory calculus, linear algebra, and probabilistic models. A variety of optimization problems, especially from business and economics. This course may not be taken for credit by students who have taken Mathematics 15. *(2 hours a week.)* (Discontinued, 1967).

25. Intermediate and Vector Calculus, Differential Equations: Improper integrals, infinite series, multiple integration, partial derivatives, line and surface integrals, vector calculus, differential equations, LaPlace transforms. (Prerequisite: Math. 15; corequisite: Math. 11ab). *(3 lectures, 1 tutorial hour a week.)*

27a. Linear Algebra: Finite-dimensional vector spaces, linear transformations and matrices, linear equations, quadratic forms, eigenvalues. (Prerequisite: Math. 15; corequisite: Math. 11ab). *(2 lectures a week, one semester; half course.)*

27b. Functions of a Complex Variable: Analytic functions, integration, series, contour integration, conformal mapping, boundary value problems, integral transforms. (Corequisite: Math. 25). *(3 lectures a week, one semester; half course.)*

29a. Introductory Statistics: Presentation of data, frequency distributions, measures of location and dispersion, probability, binomial and normal distributions, sampling distributions, tests of significance, goodness of fit, linear regression and correlation. (No prerequisite). *(3 lectures, 1 laboratory hour a week, one semester; half course.)*

30. Probability and Statistics: Elementary set theory and probability, empirical and theoretical frequency distributions of one variable, sampling theory, correlation and regression, goodness of fit, small sample distributions, testing hypotheses and estimation. (Prerequisites: Mathematics 15 and 25). *(3 lectures, 3 laboratory hours a week.)* (Formerly 22).

31a. Probability and Statistics: Probability theory and introduction to statistical inference. (Prerequisite: Math. 15). *(2 lectures, 1 laboratory hour a week; one semester (half course).)*

32a. Solid Analytical Geometry: Elements of solid analytical geometry including lines and planes, quadrics, ruled surfaces, transformation to principle axes, and related topics. (Corequisite: Mathematics 25). *(3 hours a week, one semester (half course).)*

32b. Modern Geometry: Logical systems, axiomatic geometry, Menelaus' and Ceva's theorems, harmonic elements, projective geometry, non-Euclidean geometries. (Corequisite: Mathematics 25). *(3 hours a week, one semester (half course).)*

33b. Advanced Calculus: Real numbers, principle of continuity, suprema and infima, sequences and series, functions of one real variable, continuous functions on a closed interval, theorems of Rolle and Lagrange, rigorous proof of chain rule, Taylor expansions, Riemann integration. *(3 lectures a week, one semester (half course).)*

35a. Fourier Series and Partial Differential Equations: Fourier series and integrals, derivation of some partial differential equations of physics, separation of variables. (Prerequisite: Math. 25). *(2 lectures a week, one semester (half course).)*

35b. Introduction to Numerical Analysis: Errors in digital computation, approximations, numerical evaluation of functions, interpolation, non-linear equations, simultaneous linear equations, numerical differentiation, numerical quadrature, numerical solution of ordinary differential equations. Students who have not taken Mathematics 20a will be required to attend computation laboratories by arrangement. (Corequisite: Math. 25 or 254ab). *(3 lectures a week, one semester; half course.)*

37. Modern Algebra: Groups, rings, fields, the integers, rational numbers, polynomials, real numbers, complex numbers, group theory, vector spaces, matrices, linear groups, determinants, canonical forms, set theory, Galois theory. *(3 hours a week.)*

40. Applied Mathematics for Engineers: Several topics selected from among the following: ordinary differential equations, vector analysis, probability, functions of a complex variable, Laplace transformations, Fourier series, partial differential equations, numerical analysis. *(2 hours a week.)*

Honours Courses

221. Foundations of Mathematics: Informal set theory and its limitations; propositional calculus; Hilbert arithmetic; the nature and historical origin of mathematical knowledge; the use of logical systems in algebra and geometry. *(3 hours a week.)*

222. Renumbered 330 in 1967.

227. Introduction to Modern Algebra: Algebraic structures, matrix calculus, vector spaces, linear systems, linear and quadratic forms, eigenvalue problems, linear groups and applications. *(3 lectures, 1 tutorial hour a week.)*

229. Analytic Geometry and Foundations of Modern Analysis: Sets, binary relations and mappings, ordered fields, the real number system, metric spaces, sequences, Bolzano-Weierstrass and Heine-Borel theorems, continuous maps, Riemann integration, differentiation, infinite series; vectors, planes and lines in the 3-space, quadratic surfaces, linear transformations of the 3-space, general quadratic equation, the n-space, vector spaces in general. *(3 lectures, 1 tutorial hour a week.)*

254a. Intermediate Calculus: Sequences, improper integrals, indeterminate forms, infinite series, partial derivatives, line and surface integrals, volume integrals. *(4 lectures, 1 tutorial hour a week; one semester (half course).)*

254b. Vector Calculus and Differential Equations: Gradient, divergence and curl with applications, Green's and Stokes' theorems, differential equations of first order, higher order differential equations with constant coefficients, series solutions of differential equations. *(4 lectures, 1 tutorial hour a week; one semester (half course).)*

300. Principles of Analysis: Point set theory, real numbers (reviewed), sequences of functions, power series, improper, iterated and multiple integrals, Taylor's formula in several variables, iterated and double limits, implicit functions, Fourier series. (Prerequisite: Mathematics 229). *(3 lectures a week.)*

330. Probability and Statistics: Set theory and probability, frequency distributions, moments, moment generating function, transformation of variables, regression and correlation, random sampling, sampling distributions, testing hypotheses and estimation, goodness of fit, X^2, t and F distributions. (Prerequisite: Math. 25 or 254ab). *(3 lectures, 3 laboratory hours a week.)* (Formerly 222).

331b. Theory of Probability: Introduction to probability, sample spaces, combinatorial analysis, conditional probability, stochastic independence, theoretical distributions, limiting distributions, laws of large numbers, generating functions, recurrent events. (Prerequisite: Math. 15, 25). *(3 hours a week, one semester (half course).)*

332. Modern Geometry: Logical systems, theorems of Menelaus, Ceva and Desargues, cross ratio and coordinate and projective geometry, non-Euclidean and metric projective geometries. *(3 hours a week.)*

337. Modern Algebra: Integers, rational numbers and fields, real numbers, polynomials, complex numbers, group theory, vectors and vector spaces, matrices, linear groups, rank and determinants, algebra of classes, transfinite arithmetic, rings and ideals, number fields, Galois theory. *(3 hours a week.)*

338a. Functions of a Complex Variable: Fundamental definitions, elementary functions, Cauchy's integral formula, residues and poles, conformal mapping, applications to the evaluation of real integrals and to the solution of some partial differential equations of physics. *(3 hours a week, one semester (half course).)*

338b. Complex Variables and Laplace Transforms: Review of theory of functions of a complex variable, introduction to the theory of the Laplace transformation, solution of differential equations by Laplace transform methods. (Prerequisite: Mathematics 338a). *(2 lectures, 2 tutorial hours a week, one semester (half course).)*

342b. Differential Geometry: Vector operations in linear geometry, metric vector operations, infinitesimal vector operations, theory of curves and surfaces, Cartan calculus. *(3 hours a week, one semester (half course).)*

354b. Theory of Differential Equations: Existence and uniqueness theorems for ordinary and partial differential equations, comparison and oscillation theorems, methods of solution. (Prerequisite: Mathematics 254ab). *(3 hours a week, one semester, half course).*

355b. Differential Equations and Special Functions: Series solutions of linear ordinary differential equations with emphasis on Bessel functions, Legendre polynomials, hypergeometric series, eigenvalue problems, Sturm-Liouville equations, Fourier series, orthogonal functions. (Prerequisite: Mathematics 254ab or 25). *(3 hours a week, one semester, half course).*

399. Renumbered 399y and reduced to half course in 1967.

399y. Honours Seminar I: Students will discuss mathematical topics under the guidance of one or more members of the staff. This seminar is required of all students expecting to graduate in Honours Mathematics. *(2 hours a week; half course).*

400. General Topology: Metric spaces, completeness, Baire's Theorem, compact metric spaces, topological spaces, product and quotient spaces, separation axioms compact spaces, connected spaces. *(2 hours a week.)*

429b. Synthetic and Analytic Projective Geometry: Principles of duality, correlation of geometric figures, harmonic ranges, harmonic pencils, Pascal's and Brianchon's theorems, poles and polars, analytic foundations of projective geometry, perspectives, affine and Euclidean geometries from the projective point of view, the classical non-Euclidean geometries, the geometric continuum. *(3 hours a week, one semester (half course).*

431a. Probability: Set theory, probability measure, probability axioms, random events, random variables. Theoretical distributions, moments, moment generating functions, characteristic functions, convolution, limit theorems. (Prerequisite: Mathematics 330 or 331b). *(3 hours a week, one semester, half course).*

431b. Statistics: Sample theory, sampling distributions, sample moments, order statistics, testing of hypotheses, theory of estimation, power, analysis of variance, multivariate theory, non-parametric methods. (Prerequisite: Mathematics 431a). *(3 hours a week, one semester, half course).*

435. Numerical Analysis: Functional approximations, numerical solution of simultaneous linear equations, calculation of eigen-values and eigen-vectors of matrices, numerical treatment of ordinary and partial differential equations, numerical solution of integral equations. (Prerequisite: Math. 35b.) *(3 lectures a week.)*

444. Theory of Functions of a Real Variable: Measure and integration, point-set theory, Lebesgue-Stieltjes measures, measurable functions, integration, convergence theorems, Hilbert and Banach spaces. *(3 hours a week.)*

448. Theory of Functions of a Complex Variable: Point sets, analytic functions, conformal mapping, integration, infinite series and applications, integral and meromorphic functions. *(2 hours a week.)*

449a. Modern Differential Geometry: Differential manifolds, tensor fields, exterior differential calculus, spaces with affine connection, Riemannian spaces, introduction to generalized metric spaces. *(3 hours a week, one semester (half course).)*

449b. The Theory of Relativity: Special theory of relativity, relativistic dynamics, electromagnetic fields, retarded and advanced potentials, Lorentz, Dirac and Feynman classical theories, general theory of relativity and introduction of unified field theories. *(3 hours a week, one semester (half course).)*

450. Mechanics of Continuous Media: Strain, invariants, compatibility conditions, strain rate, circulation, vorticity, stress tensor, equations of motion, potential and strain energy, entropy, constitutive equations, theory of elasticity, finite deformations of incompressible solids, fluid dynamics, viscosity, Navier-Stokes equations, viscoelasticity, steady sheer flow and helical flow of simple fluids. (Prerequisite: Mathematics 342b, Physics 350). *(3 hours a week.)*

451. Advanced Dynamics and Quantum Theory: (1) The Hamilton equations of motion, canonical transformations, Hamilton-Jacobi theory, the Kepler problem, the Bohr atom, Sommerfeld theory, small oscillations. (ii) Quantum theory: historical introduction; dynamical variables and observables, quantum conditions, equations of motion, elementary applications, perturbation theory, systems of many particles, theory of radiation, applications to atoms and nuclei, relativistic theory of the electron, theory of positrons. (Prerequisite: Mathematics 342b, Physics 350). *(3 hours a week.)*

453. Methods of Applied Mathematics: Partial differential equations, special functions of mathematical physics, spectral theory of differential and integral equations, integral transforms, topics from the calculus of variations. (Prerequisite: Mathematics 355b). *(2 hours a week.)*

499. Honours Seminar II: Students will discuss mathematical topics under the guidance of one or more members of the staff. This seminar is required of all students expecting to graduate in Honours Mathematics. *(2 hours a week.)*

MODERN LANGUAGES

Officers of Instruction:

Professors: Rev. C. J. Drouillard, C.S.B., Ph.D. (Head of the Department).
Miss Lillian McCarthy, Ph.D.

Associate Professor: A. A. Thibault, D. es L.

Assistant Professors: Sr. Pauline of Mary, S.N.J.M., M.A.
Rev. R. S. Pazik, C.S.B., M.A.
Mrs. B. Zakon, M.A.
Rev. J. C. O'Donoghue, C.S.B., M.A.
W. S. Skakoon, M.A.
B. D. Kingstone, Ph.D.
Sr. Marie-du-Crucifix, S.N.J.M., Ph.D.
C. Figuerola, Ph.D.
T. Llanos, Lic.
D. Horn, Ph.D.
V. Perez-Soler, Ph.D.

Lecturers: Rev. A. J. Weiler, C.S.B., B.A.
P. W. Halford, M.A.
Rev. C. M. Taylor, C.S.B., M.A.

For major in general course, see p. C-23; for Honours English and French, p. C-27; for Honours English and Spanish, p. C-29; for Honours French and Spanish, p. C-30; for Honours English and Philosophy (Language option), p. C-29; for Honours French and Latin, p. C-30; for Honours Philosophy and Latin (French option), p. C-35.

I. FRENCH

Major requirements: five to seven courses, including 14, 22y, 23y, 27, 31, 37.

Minor requirements: three to five courses, including 14, 22y, 23y, 27.

A. Elementary: Emphasis is placed on the acquisition of basic reading and writing skills and of oral and aural comprehension. Laboratory work is required of all students. *(3 lectures, 2 laboratory hours a week.)* (Discontinued, 1967).

2. Intermediate: This course is designed to teach the student accurate writing, rapid reading and exact comprehension. Training in the basic skills of aural comprehension and conversation will be given in the laboratory. (Prerequisite: Grade 12 French). *(3 lectures, 2 laboratory hours a week.)*

4. Elementary and Intermediate: Emphasis is placed on the acquisition of basic reading and writing skills and of oral and aural comprehension up to and including the intermediate level outlined in French 2. (No previous course of study in French is required). *5 lectures, 2 laboratory hours a week.)*

11. Conversation and Civilization: This course is designed to develop oral fluency in the language as well as to give a general introduction to French culture. (Prerequisite: French 2 or French 4 or Grade 13 French). *(3 lectures a week; laboratory work may be assigned by the instructor.)*

12. Modern Literary Texts and Civilization: This course is designed to develop reading, comprehension of modern French as well as to give a general introduction to French culture. (Prerequisite: French 2 or French 4 or Grade 13). *(3 hours a week.)*

13. French Canadian Literature: Intended for those whose native tongue is French and for those who have taken Special French. By permission of the Department. *(3 hours a week.)*

14. Intensive oral-aural training, composition and civilization. This course is designed for those planning to follow an Honours, major or minor program of French studies. (Prerequisite: French 2 or French 4 or Grade 13). *(3 lectures, 2 laboratory hours a week.)*

French 11 or French 12 or French 13 or French 14 is prerequisite for all following courses in French. However, students who have taken French 11, 12 or 13 will be accepted in a French program only on the basis of total performance and with the permission of the Department.

French 22y and French 23y may not be taken as options but only as part of a major or minor.

22y. Conversation, Phonetics: Systematic oral practice for those students who wish to develop a fluency in speaking French. *(2 lectures, 2 laboratory hours a week; half course.)*

23y. Advanced Composition. *(2 hours a week; half course.)*

27. French Literature of the Renaissance and Classical Periods: Study of representative literature of the sixteenth and seventeenth centuries: reading, lectures, discussion and reports. *(3 hours a week.)*

31. Realism to the present time. (Prerequisite: French 27, or permission of the Department). *(3 hours a week.)*

37. Literature of the Eighteenth Century and Romanticism. (Prerequisite: French 27, or permission of the Department). *(3 hours a week.)*

Honours Courses

260y. Prose Composition. *(1 hour a week; half course.)*

261y. Conversation, Phonetics. *(1 lecture a week; laboratory hours to be arranged; half course.)*

270. Literature of the Seventeenth Century: Reading, lectures, discussions and reports. *(3 hours a week.)*

375y. Advanced Prose Composition. *(1 hour a week; half course.)*

376b. French Canadian Literature. *(2 hours a week, one semester; half course.)* (Formerly French 376y.)

376y. Renumbered 376b in 1967.

378a. Literature of the Sixteenth Century: Reading, lectures, discussions and reports. *(2 hours a week, one semester; half course.)* (Formerly French 378y.)

378y. Renumbered 378a in 1967.

380. The Literature of the 18th Century: Lectures, reading, discussion, reports in French. (Prerequisite: French 27).

490. The Literature of the 19th Century: Pre-Romanticism, Romanticism, Naturalism and Symbolism in poetry, the novel and the drama. (Prerequisite: French 380). *(3 hours a week.)*

495. The Literature of the 20th Century: Poetry, the Novel and Drama. *(3 hours a week.)*

496y. Old French. *(2 hours a week; half course.)*

II. GERMAN

Major requirements: five to seven courses, including 12, 22y, 23y, 21, 31, 34.

Minor requirements: three to five courses, including 12, 21, 22y, 23y.

A. Elementary: Pronunciation. Emphasis is placed on the acquisition of basic reading and writing skills and of oral and aural comprehension. Laboratory work is required of all students. *(3 lectures, 2 laboratory hours a week.)* (Discontinued, 1967).

Ax. Elementary Reading Course: Pronunciation, writing, grammar, syntax; translation of scientific texts. *(3 hours a week.)*

2. Intermediate: Grammar, composition, translation, laboratory work. (Prerequisite: German A or Grade 12 German). *(3 lectures, 2 laboratory hours a week.)* (Discontinued, 1967).

4. Elementary and Intermediate: Emphasis is placed on the acquisition of basic reading and writing skills and of aural and oral comprehension. No previous study of German is required. *(5 lectures, 2 laboratory hours a week.)*

12. Advanced: Readings from modern German authors, composition and oral practice. (Prerequisite: German 4 or Grade 13 German). *(3 lectures, 2 laboratory hours a week.)*

21. Romanticism. (Prerequisite: German 12). *(3 hours a week.)*

22y. Advanced conversation: Systematical practice for those students who wish to develop a fluency in speaking German. *(2 hours a week; half course.)*

23y. Advanced composition. *(2 hours a week; half course.)*

31. German literature of the 20th century. *(3 hours a week.)*

34. Early modern literature, classicism and romanticism: Introduction to Goethe. *(3 hours a week.)*

III. ITALIAN (Not offered, 1967-68).

A. Elementary: Grammar, translation, dictation, oral practice. Laboratory work is required of all students. *(3 lectures, 2 laboratory hours a week.)*

2. Intermediate: Grammar, translation, composition, oral practice, laboratory work, (Prerequisite: Italian A or Grade 12 Italian). *(3 lectures, 2 laboratory hours a week.)*

12. Advanced: Grammar analysis, dictation, translation, reading, introduction to Italian history and literature, conversation. Laboratory work required. (Prerequisite: Italian 2 or Grade 13 Italian). *(3 lectures, 2 laboratory hours a week.)*

IV. RUSSIAN

A. Elementary: Pronunciation, grammar, dictation, translation, oral practice. Laboratory work is required of all students. *(3 lectures, 2 laboratory hours a week.)* (Discontinued, 1967).

Ax. Elementary Reading Course: Pronunciation, writing, grammar, syntax; translation of scientific texts. *(3 hours a week.)*

2. Intermediate: Grammar, dictation, translation, composition, conversation. Laboratory work required. (Prerequisite: Russian A). *(3 lectures, 2 laboratory hours a week.)* (Discontinued, 1967).

4. Elementary and Intermediate: Emphasis is placed on the acquisition of basic reading and writing skills and of oral and aural comprehension. (No previous course of study in Russian is required). *(5 lectures, 2 laboratory hours a week.)*

12. Advanced: Readings from Russian literature and analysis of texts. Translation, composition, conversation, laboratory work. (Prerequisite: Russian 4). *(3 hours a week.)*

V. SPANISH

Major requirements: five to seven courses, including 12 or 14; 20, 21, 30.

Minor requirements: three to five courses, including 12 or 14; 20, 21.

Prerequisite: The following courses or their equivalents must be completed before the requisite courses for the major can be begun: Spanish of Grade 12 and Grade 13; or Spanish 4.

A. Elementary: Grammar, translation, dictation, oral practice. Laboratory work is required of all students. *(3 lectures, 2 laboratory hours a week.)* (Discontinued, 1967).

2. Intermediate: Grammar, translation, composition, oral practice, laboratory work. (Prerequisite: Spanish A or Grade 12 Spanish). *(3 lectures, 2 laboratory hours a week.)* (Discontinued, 1967).

3. Elementary and Intermediate: Composition, conversation and selected readings. *(5 lectures, 2 laboratory hours a week.)*

4. Elementary and Intermediate: Grammar, translation, dictation, oral practice; laboratory work is required of all students. (This course is intended only for those who have a high proficiency in language and who intend to pursue the Honours course. Others may enter only with approval of the Department Head. Students entering this course from Grade 13 will be permitted to take the Honours courses on approval from their instructor, following the successful completion of Spanish 4). *(5 lectures, 2 laboratory hours a week.)*

12. Advanced: Composition, conversation, and selected readings. *(3 lectures, 2 laboratory hours a week.)*

14. Advanced: Grammar, written expression; phonology, morphology, oral expression. (This course is intended to improve proficiency in Spanish by intense preparation to handle all aspects of the language. It is intended only for those who have taken Grade 13 or Spanish 4 or who intend to pursue the Honours course. Others may enter with the approval of the Department Head). *(5 lectures and laboratory hours.)*

20. Survey of Spanish Literature: *(3 hours a week.)*

21. Hispanic Culture: Civilization of Spain and Spanish America. *(2 hours a week.)*

22y. Advanced Conversation: Systematical oral practice for developing fluency in speaking Spanish, laboratory work. *(2 hours a week; half course.)*

23y. Renumbered 32y in 1967.

25. Hispanic Theatre and Poetry: Spanish and Spanish-American. Drama and the main traditions of Spanish poetry. *(3 hours a week.)* (Discontinued, 1967).

30. Golden Age: Theatre, poetry and prose. *(3 hours a week.)*

31. Eighteenth and Nineteenth Century Literature: Spain and Spanish America. *(3 hours a week.)*

32y. Advanced Composition. *(1 hour a week; half course.)* (Formerly Spanish 23y).

33. Contemporary Hispanic Prose: Main currents of contemporary prose through selected Hispanic authors. *(3 hours a week.)* (Discontinued, 1967).

34. Spanish-American Literature: Literature of Mexico, Central and South America through selected authors. *(3 hours a week.)* (Discontinued, 1967).

37. Mediaeval and Pre-Renaissance Literature. *(3 hours a week.)*

38. Twentieth Century Literature: Spain and Spanish America. *(3 hours a week.)*

39y. Modern Spanish: Usage and syntaxis. *(1 hour a week.)*

Honours Courses

Prerequisite: Spanish 3 or Spanish 4 or Grade 13 Spanish; or Spanish 12 or 14.

Requisite: All courses listed below are required to complete the Honours program.

Honours courses, assigned at the discretion of the Department Head may form part or all of the requirements for the first year of the two-year program leading to the degree of Master of Arts.

220. Survey of Spanish Literature: An introduction to literature through selected pages from principal works of Spanish authors. *(5 hours a week.)*

221. Hispanic Culture: The civilization of Spain and Spanish America. *(2 hours a week.)*

222y. Advanced conversation. *(1 hour a week; half course.)* (Discontinued, 1967).

223y. Advanced composition. *(2 hours a week; half course.)* (Discontinued, 1967).

225. Hispanic Theatre: Spanish and Spanish-American drama – the Golden Age and the modern movements. *(3 hours a week.)* (Discontinued, 1967).

322y. History of the Spanish Language: The evolution of the Spanish language in Spain and Spanish America. *(1 hour a week; half course.)*

330. Literature of the Golden Age: Spanish Literature from the late Renaissance through the Baroque period. The prose, poetry and theatre of the Spanish masters of the Sixteenth and Seventeenth Centuries. *(3 hours a week.)*

331. Eighteenth and Nineteenth Century Literature: Spain and Spanish America. *(3 hours a week.)*

338y. Introduction to Romance Philology. *(1 hour a week; half course.)* (Discontinued, 1967).

374. Classical prose: The prose of the Golden Age from Cervantes to Quevedo. *(2 hours a week.)* (Discontinued, 1967).

380. Contemporary Hispanic Prose: Main currents of contemporary prose through selected Hispanic authors. *(3 hours a week.)* (Discontinued, 1967).

437. Mediaeval and Early Renaissance Literature: Spanish poetry, prose and theatre from its origins to the Golden Age, with clarification of linguistics problems. *(3 hours a week.)* (To be offered in 1968).

438. Twentieth Century Literature: Spain and Spanish America. Critical study of the main works of this century. *(3 hours a week.)* (To be offered in 1968).

439y. Modern Spanish: Usage and syntaxis. *(1 hour a week; half course.)* (To be offered in 1968).

490. The literary currents of Spanish America: Historiographers, works of colonial period and of the Independence, Modernist movement, Mexican novel of the Revolution, the cuento. *(3 hours a week.)* (To be discontinued in 1968).

495. Spanish lyrical poetry: From Garcilaso to the present times. *(3 hours a week.)* (To be discontinued in 1968).

496y. Old Spanish. *(1 hour a week.)* (To be discontinued in 1968).

MUSIC

Officers of Instruction:

Assistant Professor: C. Morey, Ph.D.
Sessional Instructor: E. F. Gmeiner, B.Mus.

Major and Minor Requirements:

Major: Music 11, 21, 28, 31 and 38.

Minor: Music 11, and at least two from 21, 28, 31, 38; at least one history course must be taken.

Option: Music 11, 20, 28, or 38 if student satisfies minimum musical requirements.

For major in the general program, see p. C-23.

Students electing a major or minor in Music must participate in a University choral or instrumental ensemble for at least one year.

*Courses marked with an asterisk may not be taken as part of the major or minor in the General Course.

1. Materials of Music: A preliminary course dealing with beginning exercises in pitch, rhythm and musical notation; simple chord construction; principal musical forms in historical context. *(3 hours a week.)* (Discontinued, 1967).

10*. Applied: Private instrumental or vocal instruction. Remedial piano. Class piano for instrumentalists or singers not equal in facility to at least the level of the Grade IV examination of the Royal Conservatory. *(½ hour a week.)*

11. Materials of Music: Basic harmonic materials: triads, seventh chords, melody, simple formal patterns. *(3 hours a week.)*

12y*. Ear Training: Recognition of melodic and harmonic patterns; sight singing. *(1 hour a week; half course.)*

18*. Music literature: Studies in musical style: significant compositions in Western music from the Middle Ages to the present day. *(2 hours a week.)*

20. Music of Western Civilization: General survey of the development of major styles in western music. Designed for the non-specialist and open to all students in the University. *(3 hours a week.)* (Formerly 22).

21. Theory: Ear training; development of contrapuntal writing; contemporary techniques of composition. (Prerequisite: Music 11). *(3 hours a week.)*

22. Renumbered 20 in 1967.

23. Renumbered 28 in 1967.

28. History of Music: From the middle ages to the late eighteenth century. *(3 hours a week.)* (Formerly 23).

31. Theory: Counterpoint: sixteenth century vocal style; advanced canonic and fugal writing. Orchestration: basic scoring for instruments. (Prerequisite: Music 21). *(3 hours a week.)*

33. Renumbered 38 in 1967.

38. History of Music: From the eighteenth century to the present day. *(3 hours a week.)* (Formerly 33).

Honours Courses

200. Applied: Private instrumental or vocal instruction. *(½ hour a week; full course.)*

201y. String Techniques: Introduction to the playing of string instruments with special attention to one instrument. Instruments will be provided for practice. *(1 hour a week; half course.)*

202y. Woodwind and Brass Techniques: Introduction to the playing of wind instruments with special attention to one instrument. Instruments will be provided. *(1 hour a week; half course.)*

203y. Choral techniques: Rudiments of choral music; ear training and rehearsal methods. Discussion will always be related to the development of repertoire. *(1 hour a week; half course.)*

221. Materials of Music: Chromatic harmony and composition in simple forms. *(3 hours a week.)*

222y. Ear Training. *(1 hour a week; half course.)*

223y. Keyboard Harmony: Simple progressions, modulations, sight harmonization of simple melodies. *(1 hour a week; half course.)*

228. History of Music: Mediaeval period to Mozart. *(2 hours a week.)*

229y. Music Bibliography: Reference works, special studies, collected editions. *(1 hour a week; half course.)*

300. Applied: Private instrumental or vocal instruction. *(½ hour a week; full course.)*

301y. String Techniques: An instrument to be chosen for special study which has not been chosen in Music 201y. *(1 hour a week; half course.)*

302y. Woodwind and Brass Techniques: An instrument to be chosen for special study from the family of instruments not chosen in Music 202y. *(1 hour a week; half course.)*

303. Choral Technique: Continuation of Music 203y. *(2 hours a week.)*

304. Band and Orchestral Techniques: Organization and training; repertoire for winds, strings, mixed groups. *(2 hours a week.)*

305y. Conducting: Principles of baton technique. *(1 hour a week; half course.)*

331. Theory: Contemporary techniques. *(3 hours a week.)*

333y. Keyboard Harmony: Transposition, figured bass, score reading. *(1 hour a week; half course.)*

334y. Orchestration: Woodwinds, horns and strings in small ensembles; problems of transcription; score study. *(1 hour a week; half course.)*

335y. Orchestration: Wind and percussion instruments, small and large groups. Problems of transcription. *(1 hour a week; half course.)*

336. Counterpoint and Fugue: 16th Century style; 5-part counterpoint on a given cantus firmus. 18th century fugue. *(2 hours a week.)*

338. History of Music: Mozart to the present. *(3 hours a week.)*

350. Seminar: Composition or history and literature, special problems to be set by instructor. *(2 hours a week.)*

400. Applied: Private instrumental or vocal instruction. *(½ hour a week; full course.)*

402y. Woodwind and Brass Techniques: Continuation of Music 302y. *(1 hour a week; half course.)*

403. Choral Technique: Continuation of Music 303. *(2 hours a week.)*

404. Band and Orchestral Techniques: Continuation of Music 304. *(3 hours a week.)*

406y. Percussion Techniques. *(½ hour a week; half course.)*

443y. Keyboard Harmony: Improvisation; emphasis on score reading and transposition. *(1 hour a week; half course.)*

444y. Orchestration: Scoring for large orchestra. Score study. *(1 hour a week; half course.)*

445y. Orchestration: String groups; strings and winds. *(1 hour a week; half course.)*

447. Choral Arranging: Methods of arranging various voices in various combinations. *(2 hours a week.)*

450. Seminar: Composition OR history and literature to include a substantial paper; or an original composition. *(3 hours a week.)*

NURSING

Officers of Instruction:

Associate Professors: Miss Florence M. Roach, B.Sc., Reg.N. (Director).
Miss Margaret N. Lee, Ed.D.

Assistant Professors: Miss Leta G. Sanders, M.A. (Education), Reg.N.
Miss Ruth A. Ingram, M.N. (N.Ed. and P.H.N.), Reg.N.
Miss Mary E. Molloy, M.Sc.N. (Administration), Reg.N.

For Nursing programs, see p. C-53 ff.

1a. Modern Concept of Health: General consideration of the universally accepted concepts of health as a foundation for understanding deviations from normal; the prevention of illness relative to both the individual and the community. *(2 hours a week, one semester (half course).)*

10y. Orientation to Nursing: The introduction of the beginning student to the modern concept of nursing in its broad field; to the patient as a person; to her individual role as part of the patient's therapy, and, as a contributing member of the health team; the value of the nurse-citizen to the community. *(1 hour a week (half course).)*

20. Health services in contemporary society. (Prerequisite: Biology 34, Microbiology 16b, Sociology 12). (Prerequisite or corequisite: Political Science 20). (Not offered until 1968-69).

21a. Planning for total nursing care including field experience. (Prerequisite or corequisite: Nursing 20, Psychology 22, Psychology 26). (Not offered until 1968-69).

21b. Planning for total nursing care, continued, including field experience. (Prerequisite or corequisite: Nursing 20, Psychology 22, Psychology 26). (Not offered until 1968-69).

30. Teaching and learning in nursing situations. (Prerequisite or corequisite: Nursing 20, Nursing 21ab, Psychology 22, Psychology 26). (Not offered until 1969-70).

30a. Fundamentals of Administration: Principles and elements of administration of nursing service; the role and functions of the clinical supervisor and head nurse. *(2 hours a week, one semester (half course).)*

31. Teaching in Schools of Nursing: Qualifications; methods; curriculum; planning course and lesson content; evaluation techniques. *(4 hours a week.)*

31a. Field observation experiences and seminar, in relation to Nursing 30. (Prerequisite or corequisite: Nursing 30). (Not offered until 1969-70).

31b. Aspects of leadership in nursing, with field experience. (Prerequisite or corequisite: Nursing 30). (Not offered until 1969-70).

32b. Trends and Developments in Nursing: A broad concept of what is involved in the practice of professional nursing; the professional nursing organizations; factors influencing past development as well as present and future trends; consideration of research, study reports. *(2 hours a week, one semester (half course).)*

32y. Aspects of current developments in professional nursing. (Prerequisite or corequisite: Nursing 30, Nursing 31ab). (Not offered until 1969-70).

33a. Community Health Nursing: Trends in public health practices necessary for the protection and promotion of individual health; community health facilities, their organization and function; the integration of social and health aspects in the basic nursing curriculum. *(2 hours a week, one semester (half course).)*

34. Principles and Practices of Community Health Nursing: Philosophy, goals and function of community health nursing; integration of social and related public health principles to promote the physical and mental well being of the individual as a member of family and society, and as an occupational group, including preventive principles and methods in relation to the worker and his environment, consideration of health needs in growth and development from birth to senescence, in terms of modern health concepts. *(4 hours a week.)*

35. Preventive Medicine and Health Supervision: Trends in public health practices; organization, administration and legislation for health maintenance from the international to the community level; epidemiological, statistical and nutritional concepts; environmental sanitation and safety; health education and civil defence. *(3 hours a week.)*

36b. Financial Administration of a Hospital Nursing Service Department: Principles and procedures of financial administration and budgeting. *(2 hours a week, one semester (half course).)*

37. Nursing Administration: Planning and operation of the department of nursing service and the school of nursing; physical features; staffing; personnel policies and services; medico-legal factors. (Prerequisite: Nursing 30a or equivalent). *(2 hours a week, first semester; 3 hours a week, second semester.)*

38. Nursing Administration: This follows the general pattern of Nursing 37 but is on an advanced level and students must complete, under direction, a comprehensive study related to their specialty field. (Prerequisite: Nursing 30a or equivalent. *(3 hours a week in first semester and 2 hours a week in second semester.)*

39b. Occupational Health Services: Historical, social and economic aspects of occupational health; preventive principles and methods in relation to the worker and his environment; analysis and evaluation of the professional responsibility of the occupational health nurse in health programs for employee groups. *(1 hour a week, one semester (half course).)* (Discontinued, 1967).

PHILOSOPHY

Officers of Instruction:

Professors: J. N. Deck, Ph.D.
The Rev. F. T. Kingston, D.Phil.

Associate Professors: P. F. Flood, M.A.
S. B. Cunningham, Ph.D. (Acting Head of the Department).
Rev. L. A. Kennedy, C.S.B., Ph.D.
D. B. Kuspit, Ph.D.

Assistant Professors: J. V. Brown, M.A.
Rev. P. F. Wilkinson, L.Th.
R. C. Pinto, M.A.
J. U. Lewis, Ph.D.
Rev. T. J. Stokes, C.S.B., Ph.D.

Lecturer: R. H. Johnson, B.A.

Special Lecturer: Rev. N. J. Ruth, C.S.B., M.A.

Holy Redeemer College: Assistant Professor: Rev. A. E. Alexander, C.Ss.R., Ph.L.
Lecturer: Rev. T. I. Kelly, C.Ss.R., S.T.L.

Major requirements: five to seven courses, including 15; and two of 23, 24, 27, 31.

Minor requirements: three to five courses, with 15 recommended.

For major in general course, see p. C-23; for Honours Philosophy, see p. C-35; for Honours English and Philosophy (Language option), p. C-29; for Honours History (Philosophy option), p. C-32; for Honours Philosophy and Mathematics, p. C-36; for Honours Philosophy and Psychology, p. C-36; for Honours Philosophy and Latin, p. C-35; for Honours Theology and Philosophy, p. C-41.

15. Introduction to Western Philosophy: Philosophy as seen through its history and current applications; the development and resolution of selected philosophical problems in the Western tradition with readings from ancient, modern, and contemporary philosophers. *(3 hours a week.)*

19. Great Ideas in Western Civilization: The meaning of change; space and time; cause-effect and the question of probability; man in the realms of knowledge and opinion; hypothesis; the constitution of science. Limited readings from the Presocratics, Plato, Aristotle, Descartes, Hume and Kant. *(2 hours a week; open only to students enrolled in the Faculty of Applied Science.)*

21a. Logic: The logical operations, simple apprehension, judgment and reasoning; their use in the sciences and in infrascientific cognition. The epistemological analysis of logic. *(3 hours a week, one semester (half course).)* Offered at Holy Redeemer College only.

21. Formal Logic: Language; the deductive logic of Aristotle and its critics; fallacies; the nature of concepts and judgments; induction and probability. *(3 hours a week.)*

22. Ethics: The principles of human actions; voluntariness, freedom and responsibility; the determination of good and evil; the virtues; law. Representative historical positions. *(3 hours a week.)*

23. Early Modern Philosophy: The Renaissance background; Descartes, Spinoza, Leibniz, Locke, Berkeley, Hume. *(3 hours a week.)*

24. Greek Philosophy: A study of Greek philosophers from the Ionians to the Neo-Platonists. Readings in original and secondary source material. *(3 hours a week.)*

25a. Philosophy of Nature and of the Sciences: Philosophic analysis of change; causality and finality in nature; the philosophy of man; speculative and practical intellect; the degrees of knowledge; the epistemology of art and of the physical and social sciences. (Offered at Holy Redeemer College only). *(3 hours a week, one semester (half course).)*

25b. Social Philosophy: The nature and function of society. Political, economic, educational and religious societies. Contemporary social problems. The relationship between philosophy and the social sciences. (Offered at Holy Redeemer College only). *(3 hours a week, one semester (half course).)*

25. Social Philosophy: An attempt to understand what society is, its relation to human nature, the part that society – and especially political society – plays in the fulfillment of distinctively human ends and goals. *(3 hours a week.)*

26. Philosophy of Education: The moral and metaphysical purpose of the education of man. Perennial and contemporary problems in the philosophy of education. *(3 hours a week.)*

27. Medieval Philosophy: The major philosophical currents from the fourth to the sixteenth century. *(3 hours a week.)*

28. Philosophical Psychology: The philosophical elucidation of certain key concepts in our thinking about man: knowledge, perception, imagination, understanding, desiring, willing. (Prerequisite: Philosophy 15 or permission of Department). *(3 hours a week.)*

28b. Philosophical Psychology: The detailed analysis of human behaviour, presented historically and systematically. Vegetative powers, external and internal senses, intellect and will. *(3 hours a week, one semester (half course).)* (Offered at Holy Redeemer College only).

29. Science and Man in Western Civilization: Science as an intellectual fulfillment of human nature; the scientist and society; the scientist and contemplation; science and technology. *(2 hours a week.)*

30. Philosophy of History: An analysis of representative philosophies of history and an appraisal of the questions in philosophic anthropology, epistemology and metaphysics arising from the consideration of man in history and man as historian. (Prerequisite: Philosophy 31 or permission of the Department). *(3 hours a week.)*

31. Late Modern Philosophy: Classical modern philosophers from Kant to Bergson. *(3 hours a week.)*

32. Philosophy of Art: The distinction between a "classical" and a "romantic" theory of art: the relationship between a theory of art and the study of aesthetics. Readings from classical and modern authors. *(3 hours a week.)*

34. Metaphysics: The philosophy of being. The historical background. Analogy, participation, causality. The existence of God; the divine attributes. The One, the Good, the True, the Beautiful. The metaphysics of knowledge, epistemology. (Prerequisite: a history of philosophy course or permission of Department). *(3 hours a week.)*

35. Contemporary British and American Philosophy: Russell's Logical Atomism; linguistic analysis; the later Wittgenstein; American pragmatism; Peirce, James, Dewey. (Prerequisite: Philosophy 23 or permission of Department). *(3 hours a week.)*

36. Phenomenology and Existentialism: Husserl's phenomenology; Heidegger's *Being and Time;* an analysis of selected ideas from the writings of Sartre and other existentialists. (Prerequisite: Philosophy 31 or permission of Department). *(3 hours a week.)*

37. Advanced Ethics: An inquiry into central ethical concepts: freedom and responsibility, moral weakness, goodness and evil, fact-value, preference and approval. Reading from Plato, Aristotle, Hume, Kant, Moore and other contemporary writers. *(3 hours a week.)*

38. Symbolic Logic: A systematic presentation of both the propositional and the functional calculus followed by a consideration of allied historical and topical issues. *(2 hours a week.)*

39. The Philosophy of Law: The nature and scope of law studied in historical perspective. Emphasis upon the epistemological foundations of major philosophies of law (legal idealism, natural law theory, legal positivism, the pure theory of law, historicism, scientific value of relativism). (Prerequisite: Philosophy 31 or permission of Department. *(3 hours a week.)*

Honours Courses

221. Formal Logic: The Aristotelian concept of logic and its evaluation in modern philosophy (Mill, Dewey, Ryle, etc.); alternative systems of deductive logic; presuppositions and implications of logic in relation to epistemology and metaphysics; the logic of induction. *(3 hours a week.)*

224. Greek Philosophy: A study of Greek Philosophers from the Ionians to the Neo-Platonists. Readings from the Pre-Socrates, Plato, Aristotle, Plotinus and Proclus. *(2 lectures, 1 seminar a week.)*

228. Philosophical Psychology: The philosophical analysis of human behaviour, presented through readings of the classical philosophers, as well as contemporary analytic and phenomenological writers. *(2 lectures, 1 seminar a week.)*

323. Early Modern Philosophy: The background to Continental philosophy; Descartes, Spinoza, Leibniz; the Cambridge platonists; Locke, Berkeley, Hume; the Scottish school of common sense. *(2 lectures, one seminar a week.)*

327. Medieval Philosophy: The major philosophical currents from the fourth to the sixteenth century. Selections from St. Augustine, Avicenna, the 13th century Augustinians, Averroes, St. Thomas Aquinas, William of Occam, Peter Pomponazzi. *(2 lectures, 1 seminar a week.)*

332. Philosophy of Art: An analysis of Aristotle's *Poetics,* Hegel's conception of tragedy in an effort to distinguish a "classical" from a "romantic" theory of art. The nature of aesthetics and the way in which it differs from a theory of art. *(2 lectures, 1 seminar a week.)*

334. Metaphysics: The philosophy of being. The historical background; Plato, Aristotle. The Arabians, mediaeval Christian philosophy, Suarez, Descartes, Wolff, Kant. Analogy, participation, causality. The existence of God; the divine attributes. The One, the True, the Good, the Beautiful. The metaphysics of knowledge, epistemology. *(3 hours a week.)*

336. Phenomenology and Existentialism: Husserlian phenomenology against the background of Descartes and Kant; a systematic study of Heidegger's *Being and Time;* and other existentialists. *(2 lectures, 1 seminar a week.)*

411. Problems in the Philosophy of Science: An examination of selected readings in the philosophy of the sciences. *(2 lectures, 1 seminar a week.)*

426. Philosophy of Education: A philosophical analysis of education against its historical and contemporary background. Selected readings from classical and modern sources: Plato, Aristotle, Kant, Dewey, etc. *(3 hours a week.)*

430. Philosophy of History: Representative philosophies of history. Readings in St. Augustine, Vico, Hegel, Marx and Dilthey. *(3 hours a week.)*

431. Late Modern Philosophy: Kant's predecessors; Kant, Fichte, Schelling, Hegel, Schopenhauer, Comte, Bergson. *(2 lectures, one seminar a week.)*

435. Contemporary British and American Philosophy: Logical atomism; logical positivism; linguistic analysis; readings from Russell, Moore, Ayer and Wittgenstein. Readings from American pragmatists: Peirce, James and Dewey. *(2 lectures, one seminar a week.)*

438. Symbolic Logic: A systematic presentation of both the propositional and the functional calculus followed by a treatment of some of the main issues in the philosophy of logic. *(3 hours a week.)*

439. The Philosophy of Law: A historical and philosophical analysis of the nature and scope of law, with concentration on the epistemological foundations of modern and contemporary basic legal theory. Seminar examinations of the sources of law (e.g. custom, judicial decision, equity, legislation). *(2 lectures, 1 seminar a week.)*

447. Incorporeal Substances: Historical and systematic study of incorporeal substances. The operations, powers, nature and purpose of incorporeal substances. *(3 hours a week.)*

462. Moral Philosophy: Systematic and historical study of major problems in ethics: the distinctiveness of moral knowledge; principles of the moral act; morality and human destiny. *(3 hours a week.)*

PHYSICAL AND HEALTH EDUCATION

Officers of Instruction:

Associate Professor: P. J. Galasso, M.A. (Director).

Assistant Professors: R. J. Moriarty, M.A.
R. T. Hermiston, M.S.

Lecturers: S. L. Hilton, M.Sc.
B. D. McPherson, M.A.
J. C. Nash, M.S.

Notes:

a) General B.A. students who wish to select one or two Physical Education courses as options may select only P.H.E. 11 and/or P.H.E. 254.

b) Those students who wish to acquire a B.P.H.E. who cannot swim upon entering the program must take remedial swimming classes until they have achieved a standard equivalent to the Red Cross Intermediate Swimmer. This will be required as the minimum standard for all B.P.H.E. candidates.

c) Those students interested in taking Psychology, Sociology, Economics, Geology, or Political Science as their five-course subject of concentration should select at least two courses in one of the following areas in order to have a second teaching option with which they can be admitted to the summer session (if it is available) at the Ontario Colleges of Education. These courses include English, French, Geography, History, Latin, Mathematics, Science, Biology, Chemistry and Physics.

P.H.E. 30

This course consists of the following two parts which together constitute a full course.

30-1: Introduction to Measurement and Evaluation: A course designed to acquaint the students with elementary statistics, athletic and fitness tests and the principles of grading with emphasis on elementary and secondary school levels. *(2 hours a week, 1st semester.)* (To be discontinued in 1968).

Activities: *(4 hours a week; lectures as required.)*

30-2: Kinesiology: A study of the principles of mechanics and their use in understanding and interpreting human motion. *(2 hours lectures, 1 hour laboratory; 2nd semester.)* (To be discontinued in 1968).

Activities: *(3 hours a week; lectures as required.)*

Activities: Theory, practice and officiating (where applicable) in the following activities: Gymnastics, Judo, Golf, Archery, Badminton, Tennis, Skiing, Curling, Dance (W), Lacrosse (M), and Soccer (M).

Honours Courses (Current)

NOTE: The following Honours courses (numbered 400a to 444, inclusive) leading to the B.P.E. degree will be discontinued in 1968.

400a. Anatomy: The study of gross anatomy with a concentration on the development of muscles, joints and skeletal structure from cells to systems. *(2 lectures, 2 hours laboratory a week, one semester; half course).*

400b. Physiology of Exercise: This course deals with the physical activity and its relation to circulation, respiration, metabolism, digestion, secretion, excretion and the central nervous system. *(3 lectures a week, one semester; half course).*

401a. Advanced Coaching: The principles of coaching and the study of organization and strategy. Stress will be placed on the development of a sound coaching philosophy. *(3 lectures a week, one semester; half course).*

402b. Kinesiology: A study of the principles of mechanics and their use in understanding and interpreting human motion. *(2 lectures, 1 hour laboratory a week, one semester; half course).*

405b. History and Principles: A chronological study of the history of Physical Education from ancient to modern times and the underlying principles involved. Stress is placed on the historical framework and growth of the profession of physical education in North America. *(3 lectures a week, one semester; half course).*

407b. Organization and Administration: A lecture, reading, seminar course covering the principles governing drawing up of budgets, hiring staff, public relations, curriculum planning and the planning of athletic activities at all levels. *(3 lectures a week, one semester; half course).*

409b. Health Education: A study of the content of health education programs stressing the elementary and secondary school levels. *(3 lectures a week, one semester; half course).*

413b. Measurement and Evaluation: A course designed to acquaint the student with elementary statistics, athletic and fitness tests and the principles of grading. *(2 lectures, 1 hour laboratory a week, one semester; half course).*

415a. Athletic Training: The study of methods of training and conditioning for the various sports and the care and prevention of athletic injuries. *(3 lectures, 1 hour laboratory a week, one semester; half course).*

420. Current Research and Literature: An overview of recent research in Physical Education and its implications. The student is required to complete a research project and present it for study and discussion. *(1st semester: 1 lecture, 3 hours laboratory a week; 2nd semester: 3 laboratory hours a week).*

444. Theory, practice and officiating (where applicable) in the following activities: Lacrosse, volleyball, football, soccer, speedball, field hockey, ice hockey, basketball, gymnasium games, track and field, golf, badminton, tennis, dance, gymnastics, archery, judo, wrestling, curling, skiing and aquatics. *(5 lectures, 5 laboratory hours a week).*

NOTE: The following courses (numbered 450 to 470, inclusive) for the final year of Arts and B.P.H.E. program will be last offered in 1968-69.

450. Measurement and Evaluation of Human Performance: a) Physical Fitness Appraisal and Guidance, b) Biomechanical Analysis, c) Physiology of Exercise. An analysis of human efficiency as related to fitness, motion and the physiology of exercise. *(4 hours lectures, 2 hours laboratory).*

451a. Philosophy of Physical Education: A course to review the influence of various philosophies on Physical Education and the development of a personal philosophy of Physical Education. *(3 hours a week, 1st semester; half course).*

453a. Organization and Administration of Physical Education: An analysis of the principles governing drawing up of budgets, hiring staff, public relations, curriculum planning, and the planning of athletic activities at all levels. A segment of this course will be devoted to case studies. *(4 lectures a week, 1st semester; half course).*

457a. Current Research and Literature: An overview of recent research in Physical Education and its implications. The student is required to complete a research project and present it for study and discussion. *(1 lecture, 2 laboratory hours; 1st semester; half course).*

460b. History of Physical Education: North American: The development of Physical Education in the United States and Canada. *(2 lectures a week; 2nd semester; half course).*

461a. Camping: One week in a camping environment where the student will receive lectures and practical sessions in this field. *(Half course).*

462b. Principles of Coaching: The principles of coaching and the study of organization and strategy. Stress will be placed on the development of a sound coaching philosophy. *(3 lectures a week; 2nd semester; half course).*

464b. Health Education: A study of current problems in Health Education in the school and community. *(3 lectures a week; 2nd semester; half course).*

466b. Athletic Training: A study of the methods of training and conditioning for the various sports, and the care and prevention of athletic injuries. *(3 lectures, 1 laboratory hour; 2nd semester; half course).*

470. Activities: The year is divided into four quarters of 26 hours each. During each quarter a student may select certain single or paired options depending upon the complexity of the area involved. The activities will be covered at an advanced level, as a progression from P.E. 10, 20 and 30 thus allowing the students to concentrate in the areas of their choice. *(4 hours a week).*

Honours Program Courses (New)

NOTE: The following courses for the new Honours Physical and Health Education program will be introduced beginning with I and II Years in 1967.

11. Introduction to the History and Profession of Physical and Health Education:

This course consists of the following two parts, which together constitute a full course.

11-1: Current Practices: An overview of the profession and professional curriculum to establish a frame of reference for the student. *(3 lectures a week).*

11-2: History of Physical and Health Education: Ancient and European: The study of Physical and Health Education in nations and cultures which have had an influence on North American Physical and Health Education. *(3 lectures a week).*

15. An Introduction to Individual and Team Activities: An introduction to the theory, practice, and officiating of individual and team activities. *(4 laboratory hours a week).*

215. Theory and Practice of Individual and Team Activities: Theory, practice, and officiating of individual and team activities. *(1 lecture, 3 laboratory hours a week; half course).*

251c. Introduction to Measurement and Evaluation: A course designed to acquaint the students with elementary statistics, sports skills tests and the principles of grading with emphasis on elementary and secondary school levels. *(2 lectures, 2 laboratory hours a week, one semester; half course).*

252. Anatomy: The study of gross anatomy with emphasis on its relationship to and importance in physical activity. *(2 lectures, 2 laboratory hours a week).*

253c. Athletic Training: A study of the scientific principles and techniques of training and conditioning for athletic events. This course includes the study of the prevention, care and rehabilitation of athletic injuries. *(3 lectures, 2 laboratory hours a week; one semester; half course).*

254. Health Concepts: The study of man and the factors which affect him: hereditarily, environmentally and interpersonally. *(3 lectures a week).*

315. Theory and Practice of Individual and Team Activities: Theory, practice and officiating of individual and team activities. *(1 lecture, 2 laboratory hours a week).*

351a. Physical Fitness Appraisal: A study of the concept physical fitness with emphasis on the techniques and instruments utilized in its assessment. *(2 lectures, 2 laboratory hours a week; first semester; half course).*

352c. Kinesiology: A study of the principles of mechanics and their use in understanding and interpreting human motion. *(2 lectures, 2 laboratory hours a week; one semester; half course).*

353c. Current Health Problems: The investigation and analysis of current health problems with emphasis on contemporary research. *(2 lectures a week; one semester; half course).*

354b. Research Design: A preliminary course to acquaint the student with proper experimental designs and research paper writing. Advanced statistics are offered as analytic techniques are developed. Current research topics will be included. *(2 lectures, 2 laboratory hours a week, second semester; half course).*

355. Organization and Administration of Physical and Health Education: An analysis of the principles governing drawing up of budgets, equipment considerations, hiring staff, public relations, facility planning and the planning of athletic activities at all levels. A segment of this course will be devoted to case studies. *(2 lectures a week).*

451. Philosophy of Physical and Health Education: A course to review the influence of various philosophies on Physical and Health Education. The presentation of a major paper will be required. *(3 lectures a week, first semester; 1 lecture a week, second semester).*

452a. Advanced Kinesiology: The use of electromyography and cinematography in analysing human motion. *(3 lectures, 2 laboratory hours a week, first semester; half course).*

454. Research Project: A course requiring each student to complete a research project in an area of his own interest. The project is to be submitted as an experimental research paper. *(1 lecture a week).*

455c. Psychology and Sociology of Physical Activity: A study of the psychological and sociological aspects of sport, exercise and physical education. *(2 lectures a week, one semester; half course).*

456c. Adaptive Physical Education: A study of physical handicaps and their associated problems, and the remedial program best adapted to each problem area. *(2 lectures, 1 laboratory hour a week, one semester; half course).*

458a. Physiology of Exercise: The study of physiological systems with respect to exercise. Special attention will be given to skeletal muscles, cardiovascular and cardiorespiratory systems. *(3 lectures, 2 laboratory hours a week, first semester; half course).*

460b. History of Physical and Health Education: North American: The study of the development of Physical and Health Education in the United States and Canada using the problems approach. *(3 lectures a week).*

461a. Camping: One week in a camping environment where the student will receive lectures and practical sessions in this field. *(One semester; half course).*

462c. Principles of Coaching: The principles of coaching and the study of organization and strategy. Stress will be placed on the development of a sound coaching philosophy. *(3 lectures a week, one semester; half course).*

470. Theory and Mechanics of Individual and Team Activities: The study of advanced theories and mechanics of individual and team activities. *(5 lectures a week).*

PHYSICS

Officers of Instruction:

Professors: Lucjan Krause, Ph.D., F. Inst. P. (Head of the Department).
Geza Szamosi, D.Sc.

Visiting Professor: Vachaspati, Ph.D.

Associate Professors: John Huschilt, Ph.D.
Edwin E. Habib, Ph.D.
Nigel E. Hedgecock, Ph.D.
Frank Holuj, Ph.D.
Arie van Wijngaarden, Ph.D.
David Robinson, Ph.D.
Leopold E. Halpern, D.Phil.

Assistant Professor: Hishashi Ogata, Ph.D.

Postdoctorate Fellows and Research Associates:
B. M. Barker, Ph.D.
W. Berdowski, D.Sc.
M. S. Bhatia, Ph.D.
B. P. Kibble, D.Phil.
A. Kossakowski, D.Sc.
M. D. Lombardero, Ph.D.
H. Lozykowski, D.Sc.

Major requirements: six and a half or seven courses, including 10, 22, 23, 25b, 31, 34, 36.

Minor requirements: three to five courses, including 10, 22, 23; or 10, 26, 36.

For the general course with a major in Physics, see p. C-45; for Honours Physics, p. C-50; for Honours Biophysics, p. C-47; for Honours Physics and Chemistry, p. C-48.

1. Basic Physics: (Prerequisite: Grade 12 Physics; corequisite: Mathematics 1 and 2). *(2 lectures and one hour tutorial a week for the whole year, 3 laboratory hours a week for one semester.)*

10. Introductory Physics: Mechanics of particles; heat, gas laws and kinetic theory of gases; wave motion and sound; elementary properties of electrons, atoms and nuclei; concepts of radiative and non-radiative energy transfer. (Prerequisite: Grade 13 Physics or equivalent; corequisite: Mathematics 15). *(3 lectures, 3 laboratory hours a week.)*

11a. Introduction to Mechanics: Statics and dynamics of particles and rigid bodies, conservation of momentum and energy, applications. (Prerequisite: Grade 13 Physics or equivalent; corequisite: Mathematics 15). *(3 lectures a week, 3 laboratory hours every second week, one semester.)*

11b. Heat, Electricity and Magnetism: Fundamentals of heat and kinetic theory of gases; fields of stationary and moving charges, Ohm's law, Kirchhoff's laws, induced electromotive force, elementary A.C. theory, instruments of measurement. (Prerequisite: Physics 11a or equivalent; corequisite: Mathematics 15). *(3 lectures, 3 laboratory hours a week, one semester.)*

13. General Physics: Mechanics, properties of matter, heat and sound, light, magnetism, electricity and modern Physics. Emphasis is placed on an understanding of fundamental principles and their applications with frequent reference to Biology and Medicine. (Prerequisite: Physics 1 or Grade 13 Physics). *(3 lectures, 3 laboratory hours a week.)*

21a. Wave Motion, Sound and Light: Simple harmonic motion, vibrating bodies, acoustical phenomena; nature and propagation of light, reflection and refraction at plane and spherical surfaces, thin lenses and their aberrations, optical instruments, polarization, interference and diffraction. (Prerequisites: Physics 11a, Mathematics 15, or equivalent). *(2 lectures a week, 3 laboratory hours every second week, one semester.)*

22. Light: Elements of geometrical and physical optics. (Corequisite: Mathematics 25 or equivalent). *(3 lectures a week first semester, 2 lectures second semester, 3 laboratory hours a week all year.)*

23. Electricity and Magnetism: Electrostatics, magnetic effects of currents, motion of charged particles, electromagnetic induction, fields in matter, Maxwell's equations, DC and AC circuits and instruments. (Corequisite: Mathematics 25 or equivalent). *(3 lectures a week first semester, 2 lectures second semester, 3 laboratory hours a week all year.)*

25b. Mechanics: Elements of kinematics and dynamics of particles and rigid bodies. (Prerequisite: Physics 10 or equivalent; corequisite: Mathematics 25). *(2 lectures a week, one semester; half course.)*

26. Optics, Electricity and Magnetism: An elementary treatment of geometrical optics, physical optics, electrostatics, D.C. and A.C. circuit theory and magnetism. (Prerequisites: Physics 10 and Mathematics 15, or equivalent). *(3 lectures, 3 laboratory hours a week.)*

29. Contemporary Physics: An outline is given of the aims, methods and conclusions of the physicist, with special reference to the recent theories about the behaviour of matter on the atomic and sub atomic as well as on the cosmic scale. The course is especially designed for the non-scientist. *(2 lectures a week.)*

31. Thermodynamics: A course at the intermediate level. (Prerequisites: Physics 10, Mathematics 25, or equivalent). *(2 lectures a week.)*

34. Electronics: (Prerequisites: Physics 26 and Mathematics 25, or equivalent). *(2 lectures, 3 laboratory hours a week.)*

36. Modern Physics: A review of the properties of electrons, atoms and nuclei. An introduction to statistical mechanics and the properties of solids. (Prerequisites: Physics 26, Mathematics 25, or equivalent). *(2 lectures, 3 laboratory hours a week.)*

Honours Courses

222. Optics: Reflection and refraction of light at plane and curved surfaces; properties of mirrors, prisms and lenses; optical instruments; interference, diffraction and polarization of light. (Corequisite: Mathematics 25 or equivalent). *(3 lectures a week first semester, 2 lectures second semester, 3 laboratory hours a week all year.)*

223. Electricity and Magnetism: Forces on stationary and moving charges, electric and magnetic fields; motion of charged particles; electromagnetic induction; conductors; dielectric and magnetic materials, Maxwell's equations, DC and AC circuits and instruments. (Corequisite: Mathematics 25 or equivalent). *(3 lectures a week first semester, 2 lectures second semester, 3 laboratory hours a week all year.)*

255b. Mechanics: Conservation laws and conservative systems; the harmonic oscillator, central forces, rotating coordinates, angular momentum, kinematics of rigid bodies. (Prerequisite: Physics 10 or equivalent. Corequisite: Mathematics 25 or equivalent). *(2 lectures a week, one semester; half course.)*

331. Thermodynamics and Statistical Mechanics: The nature of heat, the first, second and third laws of thermodynamics and their applications, equations of state, Maxwell's relations and applications of thermodynamics to the properties of matter. The statistical interpretation of thermodynamics, the perfect gas, Boltzmann, Fermi and Bose distributions. (Prerequisite: Physics 10 and Mathematics 25 or equivalent). *(2 lectures a week.)*

334. Electronics: Thermionic emission and impurity conduction in semiconductors, the properties of vacuum tubes and transistors, rectifiers, amplifiers and oscillators, the general theory of feedback systems. Transmission lines, special circuits, including wide band amplifiers, trigger circuits, multivibrators, discriminators, etc. (Prerequisites: Physics 223, Mathematics 25 or equivalent). *(2 lectures a week)*

336. Modern Physics: A selection of topics will be presented, including the atomic properties of matter, the conduction of electricity through gases, the quantum theory, atomic and nuclear structure, the special theory of relativity. (Prerequisites: Physics 222 and 223, Mathematics 25 or equivalent). *(2 lectures a week.)*

355. Classical Mechanics: Dynamics of particles and systems of particles; variational principles, Lagrange's equations and Hamilton's equations of motion; canonical transformations; small oscillations, dynamics of rigid bodies; elements of mechanics of deformable bodies. (Prerequisite: Physics 255b; Mathematics 355b or equivalent). *(3 lectures and one tutorial hour a week.)*

370. Physics Laboratory: May be taken in whole or in part by students attending Physics 334 or 336. (Physics 370/1 indicates one half of the laboratory work, or 3 hours.) (Prerequisites: Physics 222 and 223 or equivalent). *(6 laboratory hours a week.)*

450. Electromagnetic Theory: Maxwell's equations; retarded potentials; boundary value problems; Poynting's vector; electromagnetic waves in dielectrics and conducting media; guided waves; multiple moments and fields; Lorentz transformations; Maxwell's equations in moving media; special theory of relativity. (Prerequisite: Physics 223, Physics 255b, Mathematics 355b or equivalent). *(3 lectures and one tutorial hour a week.)*

452a. Quantum Optics: Emission and absorption of optical radiation, the width of spectral lines, interferometric spectroscopy, Zeeman effect, nuclear magnetic resonance, optical pumping and double resonance, stimulated emission of radiation. (Prerequisites: Physics 336, Mathematics 355b or equivalent). *(3 lectures a week, one semester.)*

454b. Introduction to Plasma Physics: Atomic collisions and kinetic theory, motion of charged particles, elementary processes in the production and decay of ionization in gases, continuum magnetohydrodynamics and elementary stability theory, transport processes; waves, oscillations and radiation in plasmas. (Prerequisites: Physics 336, Mathematics 355b or equivalent). *(3 lectures a week, one semester.)*

455. Introduction to Quantum Mechanics: Particle-wave duality, the uncertainty principle, the Schroedinger equation. The harmonic oscillator and the hydrogen atom. The linear operator, eigenfunctions and eigenvalues, potential well problems, scattering theory. The matrix formulation, perturbation theories and approximation methods; identical particles and spin. (Prerequisites: Physics 336, 355, Mathematics 355b or equivalent). *(3 lectures a week.)*

466a. Solid State Physics: Elements of crystallography; lattice vibrations and thermal properties. Dielectric and optical properties of insulators. Free electron theory of metals, band structure of solids. Transport phenomena and electronic structure of metals and semiconductors. Electronic phenomena in insulators, dia-, para- and ferromagnetism, magnetic resonance phenomena. (Prerequisites: Physics 336, Mathematics 355b or equivalent). *(3 lectures a week, one semester.)*

467b. Nuclear Physics: The interactions of radiation with matter, alpha, beta and gamma decay, nuclear sizes and moments, nuclear reactions, nuclear forces and structure, fission, instruments of nuclear physics. (Prerequisites: Physics 336, Mathematics 355b or equivalent). *(3 lectures a week, one semester.)*

470. Senior Physics Laboratory: May be taken in whole or in part by students attending Physics courses bearing numbers above 400. (Physics 470/1 indicates one-third of the laboratory work, or 3 hours; Physics 470/2 indicates two-thirds, or 6 hours). (Prerequisite: Physics 370 or equivalent). *(9 laboratory hours a week.)*

POLITICAL SCIENCE

Officers of Instruction:

Professor: V. C. Chrypinski, Ph.D.

Associate Professors: W. L. White, Ph.D. (Head of the Department).
R. C. Nelson, Ph.D.

Assistant Professors: E. D. Briggs, Ph.D.
R. H. Wagenberg, Ph.D.
B. E. Burton, M.Soc.Sc.

For major in general course, see p. C-23; for Honours Economics and Political Science, see p. C-26; for Honours Political Science, p. C-37; for Honours Political Science and History, p. C-37; for Honours Political Science and Sociology, p. C-38; for Honours International Relations, p. C-33.

Major and Minor Requirements:

Major: five to seven courses, including 12, 20, and 37.

Minor: three to five courses, including 12.

12. Introduction to Political Science. *(3 hours a week.)*

20. Government of Canada: Emphasis is on federal and provincial institutions. *(3 hours a week.)*

21. American Government. *(3 hours a week.)* (Formerly 33).

23. Major Foreign Governments: Governments and politics of selected modern countries. *(3 hours a week.)*

30. Provincial Governments in Canada. *(3 hours a week.)*

32. Communist Political System. *(2 hours a week.)*

33. Renumbered 21 in 1967.

35. Canadian Public Administration: Emphasis is on the federal level. *(3 hours a week.)*

36. Municipal Government: A survey of functions and administration in Canadian municipalities. *(3 hours a week.)*

37. Development of Political Thought. *(3 hours a week.)*

Honours Courses

212. Elements of Political Science: (a) The state, its origin and activities; evolution, structure and function of democratic government and institutions, particularly in Canada, the United Kingdom, the United States. (b) Political ideas of Capitalism, Communism, Socialism and Fascism, and the relationship of each to modern democracy. *(3 hours a week.)* (Discontinued, 1967).

220. Canadian Government and Politics: General character of the Canadian Government and constitutional system. Structure, powers and functions of the executive, legislative and judicial branches at the national, provincial and local levels. Problems of federalism; franchise, elections, political parties, pressure groups, public opinion. *(3 hours a week.)*

221. American Government: A study of American Government as set forth in the Constitution. Particular attention is given to the organization, procedure and functioning of the National Government. *(3 hours a week.)* (Formerly 333).

223. Comparative Government: The governments and politics of major foreign countries. *(3 hours a week.)*

234. Introduction to Statistical Methods: Quantitative methods in Political Science. *(2 lectures, 2 laboratory hours a week.)*

330. Provincial Governments in Canada: The structure and development of provincial governments. *(3 hours a week.)*

332. Communist Political System: The organization and operation of the government of the U.S.S.R., and communist-dominated countries. A survey of contemporary political issues and problems in the communist bloc. *(2 hours a week.)* (Formerly 432).

333. Renumbered 221 in 1967.

334. The Commonwealth of Nations: A study of the Commonwealth of Nations as an organization of autonomous nations, and a survey of the governmental structures and politics of its components. *(3 hours a week.)*

336. Municipal Government in Canada: The structure and administration of municipal government in provincial jurisdictions. *(3 hours a week.)*

337. Development of Political Thought: History of political theory, stressing the major schools of thought. *(3 hours a week.)* (Formerly 352).

343. Introduction to International Politics: A study of fundamental and persistent forces in world politics. *(3 hours a week.)*

352. Renumbered 337 in 1967.

432. Renumbered 332 in 1967.

435. Canadian Public Administration: An intensive study of Canadian public administration at the federal level. *(3 hours a week.)*

440. Asian Government and Politics: An analysis of the political systems of Asia with emphasis on China, Japan, India and Pakistan. *(2 hours a week.)*

452. Political Theory: The works of major political thinkers. *(2 hours a week.)*

460. International Institutions: International institutions, including an examination of functionalism and regionalism, with emphasis on the United Nations. *(2 hours a week.)*

461. Foreign Policy of Canada and the Great Powers: The foreign policies of Canada, the United States, Great Britain, the Soviet Union and China, with emphasis on the post-war period. *(2 hours a week.)*

PSYCHOLOGY

Officers of Instruction:

Professor Emeritus: Brother R. Philip, F.S.C., Ph.D.

Professors: Rev. R. C. Fehr, C.S.B., Ph.D. (Head of the Department).
A. A. Smith, Ph.D.
V. B. Cervin, Ph.D.

Associate Professors: Rev. M. A. Record, C.S.B., M.A.
Rev. J. A. Malone, C.S.B., Ph.D.
M. E. Bunt, Ph.D.
O. Worden, Ph.D.

Assistant Professors: Rev. T. J. McGouey, C.S.B., B.A.
M. Starr, M.A.
H. W. Kirby, Ph.D.
B. P. Rourke, Ph.D.
S. A. Kushnick, Ph.D.
D. Richardson, M.A.
E. P. Sheridan, Ph.D.
C. J. Holland, Ph.D.
J. A. Neill, Ph.D.
R. Daley, Ph.D.

Sessional Instructor: A. Ortiz, M.D.

Major requirements: five to seven courses, including 15 and 28.

Minor requirements: three to five courses, including 15.

For major in general course, see p. C-23; for Honours Psychology, p. C-39; for Honours Psychology and Science, p. C-40; for Honours Philosophy and Psychology, p. C-36; for Honours Psychology and Sociology, p. C-40; for Honours Theology and Psychology, p. C-42.

15. Introduction to Psychology: A general orientation to Psychology from the scientific viewpoint. *(3 hours a week.)*

Psychology 15 is a prerequisite for all other courses in Psychology, except Psychology 35a and 454. Psychology 28 is required of all majors.

22. Developmental Psychology: The growth and development of the child and the adolescent. *(3 hours a week.)*

26a. Educational Psychology: Psychology of the learning processes; motivation; dynamics of social learning; classroom techniques. *(3 hours a week, one semester (half course).)*

26b. Educational Psychology: Counselling and guidance in the school situation: application of the principles of psychological measurement to academic and vocational guidance; mental health in the classroom. *(3 hours a week, one semester (half course).)*

28. Statistical Methods in Psychology: Basic principles and methods in the application of statistics to psychological problems. Required of all majors. *(3 hours a week.)*

30. General Experimental Psychology: A general introduction to experimental psychology through lecture and laboratory exercises. Experimental method and analysis in reference to both human and animal behaviour. *(2 lectures, 2 laboratory hours a week.)*

Psychology — Details of Subjects

31. Abnormal Psychology: Historical antecedents of abnormal psychology – psychiatric classification and objective indices of abnormal behaviour. Neurosis, psychosis, mental retardation, principles of psychotherapy and behaviour therapy – psycho-analytic theory. *(3 hours a week.)*

34. Social Psychology: A study of man as a psychological unit of society. Language, learning, leadership, propaganda, competition, culture, conflict, etc., are studied as areas of social interaction. *(3 hours a week.)*

35a. Human Engineering: An introduction to the use of psychological principles required in the design of man-machine systems. The purpose of the course is to acquaint the student with the kinds of "human design parameters" needed, and with the sources of pertinent data. *(3 hours a week, one semester (half course).)*

Honours Courses

Honours courses, assigned at the discretion of the Department Head, may form part or all of the requirements for the first year of the two year program leading to the degree of Master of Arts.

222. Developmental Psychology: The growth and development of the child and the adolescent. Special reading in theory and research of development including works of Gesell, Piaget, Freud, Montessori. Six hours observation and analysis of psychological testing of children.

225. History of Psychology: The origin and development of scientific psychology. *(3 hours a week.)*

228. Statistical Methods: Principles and methods relating to psychology and education; tests of significance. *(3 hours a week.)*

230. Experimental Psychology: Introduction to laboratory methods and interpretation of results, psychophysical approach to individual differences, the principles of learning in human and animal experiments; a short independent experiment is required of each student. *(2 lectures, 2 laboratory hours a week.)*

231. Abnormal Psychology: Concepts of and criteria of the normal and abnormal. A consideration of the organic and psychological sources of mental illness with special emphasis on the etiology, symptoms and dynamics of neuroses, psychoses and psychopathies. *(3 hours a week.)*

320. Differential Psychology: The objective and quantitative investigation of individual and group differences in behaviour. *(3 hours a week.)*

327. Psychological Tests and Measurements: Theoretical bases of test construction; study of tests used in measuring intelligence and personality; practice in the administration and evaluation of tests. *(3 hours a week.)*

332. Psychology of Perception: Theories of perception and relevant research; perception as related to other areas of psychology, particularly cognition, learning, attitudes and personality. *(3 hours a week.)*

333. Physiological Psychology: A detailed study of the nervous systems in their relation to psychological functions. Recent findings of the effect of the endocrine glands on behaviour. An evaluation of drug therapy in the treatment of mental illness. *(3 hours a week.)*

334. Social Psychology: A study of man as a psychological unit of society. Language, learning, leadership, propaganda, competition, culture, conflict, etc., are studied as areas of social interaction. Honours students will be required to carry out a social study project in addition to their regular assignments. *(3 hours a week.)*

353. Learning: Introduction to basic principles of and experiments in individual and social learning and behaviour. Factors affecting changes in and maintenance of perceptual, motor, and emotional behaviour. *(2 lectures and 2 laboratory hours a week.)*

410. Advanced Research Tutorial: Individual research and reading in specialized areas of psychology. *(2 hours a week.)*

429. Personality: A study of the theories of trait organization and the development and assessment of personality, with emphasis on individual differences. Ideas, values, attitudes and motives are considered. A special experimental study of trait relationship is undertaken by each student. *(3 hours a week.)*

450. Projective Techniques: The nature and purpose of Projective Testing. The administration, scoring, and interpretation of such tests as the Rorschach, T.A.T., C.A.T., D.A.P., H-T-P., Bender Gestalt, etc. Limited participation in clinical testing, attendance at case conferences. *(3 hours a week.)*

451. Statistical Principles and Experimental Design: Tests of significance, non-parametric tests and analysis of variance. *(3 hours a week.)*

452. Emotions: A study of the physiological basis of emotion and the more recent investigations in this area. A historical study of the development of theories of emotion and motivation. (Prerequisite: Psychology 333). *(3 hours a week.)*

454. Industrial Psychology: A study of the principles and techniques of personnel relations, managerial decision-making, and human interaction in industry. *(3 hours a week.)*

455. Comparative Psychology: Behaviour in infra-human organisms with emphasis on vertebrates. Experiments on innate behaviour, motivation, learning, retention and problem solving. *(2 lectures, 2 laboratory hours a week.)*

RUSSIAN

(See p. C-100).

SOCIAL WORK

Officers of Instruction:

Associate Professors: H. M. Morrow, M.S.W. (Head of the Department).
Miss R. M. Bruce, M.S.W.

For programs in Social Work, see p. C-58.

21. Introduction to Social Welfare: The role of the social worker in meeting human needs; review of social science concepts and explanation of their relevance to social work. *(3 hours a week.)*

23. Social Welfare Organization and Policy: The history of social welfare, public and private agencies designed to meet needs; major policies in the main organization of the field of social assistance; social insurance, medical care, child welfare, the value basis of social work. *(60 hours.)*

31. Case Work: Concepts and principles of the social case work method. Overseeing the helping process. Emphasis on the case relationship. Interviewing processes and recording practices. Case work in public and private agencies. *(60 hours.)*

32. Group Work: Group work as a special approach to the helping process. The observation and description of behaviour. Concepts of problem solving. Interaction with small groups. The uses of process recording. *(60 hours.)*

35. An Introduction to Social Work Methods: This course will give all students an introduction to the principal methods – case work, group work, community organization – some understanding of Social Work practice, and knowledge of the different methods. *(60 hours.)*

41. Principles of Social Service Organizations: Board structures, leadership development and value bases of social work agencies and their relation to the field of social work. *(60 hours.)*

43. Community Organization: Planning and co-ordination of social welfare services, problems of the community; identifying and meeting of social needs through various types of community structures and settings. *(60 hours.)*

45. Human Behaviour and the Social Environment: This course examines the factors that underlie an individual's social functioning. Personality growth and development, the socio-cultural elements in human behaviour, physical and mental illness as factors affecting individual growth, development and the social consequuences of ill-health in relation to family and community will be discussed. Emphasis will be placed on the implications for realizing social work objectives and maintaining, restoring or enhancing individual functioning. *(60 hours.)*

Seminar II for 2nd year students to help integrate class work with developing social work knowledge. *(1 hour a week.)*

Seminar III for 3rd year students to help integrate class work with developing social work knowledge. *(1 hour a week.)*

Field Observation: Students are required, under the supervision and control of the Department of Social Work, to acquaint themselves with the principles and organizational patterns of various types of social work agencies. They are required to record their observations and present these to the faculty in seminar meetings. *(20 hours a week, 12 weeks; first summer session.)*

Field Practice: Field work instruction designed to meet the special training needs of the students. Students are required to work under the supervision of social workers in those agencies which are approved by the Department of Social Work or in conjunction with the field instructors of the department. *(20 hours a week, 12 weeks; second and third summer sessions.)*

SOCIOLOGY AND ANTHROPOLOGY

Officers of Instruction:

Professor: *R. A. Helling, Ph.D. (Head of the Department).

Associate Professor: W. Y. Wassef, Ph.D.

Assistant Professor: W. W. Isajiw, Ph.D. (Acting Head).

Lecturers: S. Faber, M.A.
D. R. Stewart, M.A.
Rev. C. L. Vincent, C.S.B., M.A.
Rev. J. R. Lee, C.S.B., M.A.

*On leave.

I. SOCIOLOGY

Major requirements: five to seven courses, including 12; and at least two of 23, 24, 25, 29; and two of 31, 35, 37.

Minor requirements: three to five courses, including 12.

For major in general course, see p. C-23; for Honours Economics and Sociology, p. C-26; for Honours Political Science and Sociology, p. C-38; for Honours Psychology and Sociology, p. C-40; for Honours Sociology and Anthropology, p. C-41; for Honours Theology and Sociology, p. C-42.

12. Introduction to Sociology: The study of social organization and the social process; the analysis of group life, social contacts, interaction, social forces, conflicts, accommodation, assimilation, amalgamation, and methods of social control. *(3 hours a week.)*

23. Social Problems: The study of diverse problem areas of complex, industrial societies. The delineation of underlying forces through systematic and comparative theoretical analysis. *(3 hours a week.)*

24. Intergroup Relations: The study of the interaction between various racial, ethnic and religious groups. Problems of biculturalism, cultural pluralism, acculturation and other forms of culture contact. *(3 hours a week.)*

25. Criminology: A study of the theories of causation of crime and juvenile delinquency. The treatment of the convicted adult and juvenile offender. The operation of prison systems and probation and parole. *(3 hours a week.)*

27. Introduction to Social Work: Historical background and development of the principles of social service; analysis of the methods of case work, group work and community organization. *(2 hours a week.)*

29. Urban Community: History, nature and form of urban communities. Emphasis on theoretical formulations supported by empirical documentation of: ecological and demographic characteristics; social organization and mass phenomena. (Prerequisite: Sociology 12, or permission of the Department). *(2 hours a week.)*

31. Social Organization: The analysis of social institutions as patterned social behaviour. The study of social stratification and power structures and their impact upon personality and intergroup relations. (Prerequisite: Sociology 12, or permission of the Department). *(3 hours a week.)*

35. The Development of Sociological Theory: European and American social theory. (Prerequisite: Sociology 12, or permission of the Department). *(3 hours a week.)*

37. Social Research: Methods of research and their application in the analysis of social phenomena. Emphasis is given to the formulation of research problems, the selection of samples, the methods of data collection and alternate forms of statistical analysis. (Prerequisite: Sociology 12, or permission of the Department). *(2 lectures, 2 seminar hours a week.)*

Honours Courses

Prerequisite: Sociology 12, or permission of the Department.

224. Race and Ethnic Relations: The study of the interaction between various racial, ethnic and religious groups. Problems of biculturalism, cultural pluralism, acculturation and other forms of culture contact. *(3 hours a week.)*

225. Criminology and Penology: A study of the theories of causation of crime and juvenile delinquency. The treatment of the convicted adult and juvenile offender. The operation of prison systems and probation and parole. *(3 hours a week.)*

229. Urban Community: Form and development of the urban community. Social planning for urban redevelopment. Study of social patterns in the city. Urban rehabilitation and neighbourhood conservation. A comparative evaluation of different functional designs of cities. *(3 hours a week.)*

331. Institutions and Social Structures: The study of social institutions and structures and their impact upon personality and intergroup relations. The consequences of industrialization and automation upon the social structure of a given society. *(3 hours a week.)*

335. The Development of Sociological Theory: European and American social theory. Pioneers of sociology, contributions of sociologists in Germanic countries, Slavic countries; French sociology, English sociology and North American sociology. The recent trend in sociological theory; the theory of action. *(3 hours a week.)*

337. Social Research: Methods of research and their application in the analysis of social phenomena. Emphasis is given to the formulation of research problems, the selection of samples, the methods of data collection and alternate forms of statistical analysis. *(3 hours a week.)*

400. Scientific Study of Society: A systematic study of the central concepts and principles of sociology. The role of sociology among the social sciences. *(3 hours a week.)*

410. Directed Research Problems: The systematic study of selected problems in sociology and the analysis of the methods employed under the direction of the academic adviser. *(3 hours a week.)*

II. ANTHROPOLOGY

Minor requirements: three to five courses, including 10, 28, 31 and/or 32.

10. Introduction to Anthropology: A general survey course intended to give the student an overview of the various subdisciplines of anthropology. *(3 hours a week.)*

28. Cultural Anthropology: A discussion of the concept of culture as applied to both simple and complex societies. Course content includes the ethnology of pre-literate peoples with emphasis on their social, economic and political organization. *(3 hours a week.)*

31. Culture Contact and Culture Change: A study of historical contact between human groups and of the processes of cultural change which result from such contact. *(3 hours a week.)*

32. Ethnology: An intensive examination of a number of indigenous cultures, both in terms of material and non-material aspects. *(3 hours a week.)*

Honours Courses

228. Social Structure of Preliterate Peoples: The ethnology of pre-literate peoples with emphasis on their social, economic and political organization. The theoretical framework within which this material is treated is discussed. *(3 hours a week.)*

331. Contemporary Societies in Transition: Contemporary cultural changes in non-European areas, with material drawn from current international programs for the social and economic development of underdeveloped areas. *(3 hours a week.)*

332. North American Ethnology: A course with regional specialization in the study of indigenous groups in the United States and Canada, using material from the period of white contact. *(3 hours a week.)*

SPANISH

(See p. C-100).

SPEECH

(See p. C-72).

THEOLOGY

Officers of Instruction:

Associate Professors: Rev. E. R. Malley, C.S.B., S.T.D. (Head of the Department).
Rev. E. J. Crowley, C.Ss.R., S.S.L.
Rev. D. L. Egan, C.Ss.R., S.T.L.

Assistant Professors: Rev. J. C. Hoffman, Th.D.
J. N. King, M.A.
Rev. T. C. Akeley, O.G.S., Ph.D.
Rev. V. E. McEachern, Th.D. (Part-time).

Lecturers: *Rev. J. T. Culliton, C.S.B., M.A.
Rev. J. J. Kiessling, C.S.B., S.T.B.

*On leave.

For major in the general course, see p. C-23; for Honours History and Theology, p. C-32; for Honours Theology and Philosophy, p. C-41; for Honours Theology and Psychology, p. C-42; for Honours Theology and Sociology, p. C-42.

NOTE: 1) (R) designates courses offered by Roman Catholic theologians.
(A) designates courses offered by Anglican theologians.
(U) designates courses offered by United Church theologians.

2) Major requirements: five to seven courses, including 18 and 28.

3) Courses 10, 18, 20, 28, 30 are recommended to students who wish to **minor** in theology or choose **options** in theology. These courses also form a basis for those who wish to **major** in theology.

4) Courses 10, 20, 30 respectively have identical descriptions and are offered in each section (R, A, U).

Courses offered by Roman Catholic theologians:

10(R). Faith and Doubt in the Twentieth Century: An examination of challenges to Christian belief: the 'death of God' and atheism; evolution, creation and science; sin, pain, evil; significance of Christ; freedom and personal development. Periodic seminars will be required. *(2 hours a week.)*

12(R). Renumbered 18(R) in 1967.

13(R). Great Minds: A study of theological thought and ferment of the 19th and 20th centuries, concentrating on Newman, de Chardin, Tillich. Periodic seminars will be required. *(2 hours a week.)* (Discontinued, 1967).

18(R). Sacred Scripture: General introduction to the Bible: inspiration; literary forms; the theologies of the Old Testament; the Old Testament and Christian faith; convergent biblical themes; covenant, creation, election, redemption, messianism. Periodic seminars will be required. *(2 hours a week.)* Formerly 12(R).

20(R). Christian Living in the Twentieth Century: A biblical approach to Christian ethics, exploring problems such as 'the new morality', the tension between justice and love, problems of the individual in sex, conscience, law, liberty, family life, and other temporal values. *(3 hours a week.)*

22(R). Renumbered 28(R) in 1967.

24(R). Theological Investigations of the Mysteries of Christianity: Problem of Faith —revelation of personal God—free response of man; revelation of Father, Word, Spirit; Act of creation; problem of good and evil; Christ as final act of revelation; saving acts of Christ—life, death, resurrection; the Church; theology of Mary. Periodic seminars will be required. *(2 hours a week.)*

25(R). Catechetics — Communications in Theology: History, structure, goal, of catechetics; kerygma and catechetics. Psychic attitudes and psychological orientation in the art of communication. Great themes in catechesis—faith, sacraments, morality, sin, salvation, history, etc. *(3 hours a week.)* (Not offered in 1967-68).

27(R). Christian Commitment Today: The Biblical foundation for Christian morality. Temporal values—person, liberty, law, love, conscience, population explosion, nuclear arms, contraception, etc. *(3 hours a week.)* (Discontinued, 1967).

28(R). The Christology of the New Testament: The Kerygma; the Gospels: their formation, literary forms and theological ideas; Christological titles in the New Testament; a comparison of Johannine and Pauline theologies; exegesis of selected pericopes of the New Testament. *(3 hours a week.)* Formerly 22(R).

29(R). Vatican II Documents: Historical, theological and practical study of major problems arising from principal documents of the Council. *(3 hours a week.)* (Not offered in day division, 1967-68).

30(R). Christian Faith and Society: A study of moral responsibility in social problems on local, national and international levels: poverty, peace, technological developments; business and advertising, race relations, nuclear arms. Emphasis will be placed on historical Christianity as a significant force in society. *(3 hours a week.)*

31(R). Nature and History of the Church: Nature and structure of the Church in the light of the history of ecclesiology and Vatican Councils I and II. A study of the evolution of the Church of Christ through its major historical developments such as: the Roman persecutions, the major heresies, the eastern schism, the protestant reformation, the French revolution and modern secularism. *(3 hours a week.)*

33(R). Revelation and Apologetics: Sources of revelation; nature, meaning and purpose of theology; verifiable claims of the Church. *(3 hours a week.)* (Discontinued, 1967).

34(R). The Sacraments—Encounters with God: Theological investigations about the nature and role of each of the sacraments in the Christian life; special emphasis on marriage as a sacrament and sign of the Church and union between God and man. *(3 hours a week.)*

35(R). Modern Approaches to Christian Unity: An historical appreciation of divisions in the Church; recent developments; an analysis of papal documents and the World Council of Churches; a comparative religion treatment. *(3 hours a week.)* (Not offered in 1967-68).

Courses offered by Anglican Theologians:

10(A). Faith and Doubt in the Twentieth Century: An examination of challenges to Christian belief: the 'death of God' and atheism; evolution, creation and science; sin, pain, evil; significance of Christ; freedom and personal development. Periodic seminars will be required. *(2 hours a week.)*

12(A). Introduction to the Bible: Critical study of the development of the Old and New Testaments in their historical context from oral tradition to canonization. The apocryphal literature and the Dead Sea Scrolls. Periodic seminars will be required. *(2 hours a week.)* (Discontinued, 1967).

18(A). Sacred Scripture: the Old Testament. (Not offered, 1967-68).

20(A). Christian Living in the Twentieth Century: A biblical approach to Christian ethics, exploring problems such as 'the new morality', the tension between justice and love, problems of the individual in sex, conscience, law, liberty, family life, and other temporal values. *(3 hours a week.)*

24(A). Theological Investigations of the Mysteries of Christianity: Christian faith: the doctrines of God—The Trinity, creation, incarnation, redemption—the Church: the sacraments; holy orders. The relevance of Christianity to the twentieth century. The creeds. Periodic seminars will be required. *(2 hours a week.)*

26(A). Renumbered 34(A) in 1967.

28(A). Sacred Scripture: The New Testament—the Gospels: their formation, literary forms and theological ideas. Christology and the Kerygma. Comparison of Johannine and Pauline theologies. *(3 hours a week.)*

30(A). Christian Faith and Society: A study of moral responsibility in social problems on local, national and international levels: poverty, peace, technological developments; business and advertising, race relations, nuclear arms. Emphasis will be placed on historical Christianity as a significant force in society. *(3 hours a week.)* (Not offered in 1967-68).

31(A). Christian Belief: Development of theological thought: concerning the Trinity; the Church; the Atonement; grace; priesthood; man's nature. Periodic seminars will be required. *(2 hours a week.)* (Discontinued, 1967).

34(A). The Theology of Worship: Hebrew, New Testament, and early Christian worship. Eastern and Western Liturgies. Reformation and contemporary Protestant worship. The Anglican tradition. The Liturgical and Ecumenical Movements. *(3 hours a week.)* Formerly 26(A).

37(A). Christian Moral Living: Freedom and responsibility; legalism and grace; family and sex; communism and other political questions; war and justice; prayer, pain, and the post-Christian society. Periodic seminars will be required. *(2 hours a week.)* (Discontinued, 1967).

Courses offered by United Church theologians:

10(U). Faith and Doubt in the Twentieth Century: An examination of challenges to Christian belief: the 'death of God' and atheism; evolution, creation and science; sin, pain, evil; significance of Christ; freedom and personal development. Periodic seminars will be required. *(2 hours a week.)*

12(U). Understanding the Bible: Introduction to the Old and New Testaments, outlining their origin, formation and contents from the viewpoint of modern scholarship, the life and teaching of Jesus, the Church's beginnings, and the relevance of the Bible today. Periodic seminars will be required. *(2 hours a week.)* (Discontinued, 1967).

18(U). Understanding the Old Testament: Introduction to the Old Testament, outlining its origin, formation and contents from the viewpoint of modern scholarship; its relevance for today. Periodic seminars will be required. *(2 hours a week.)*

20(U). Christian Living in the Twentieth Century: A biblical approach to Christian ethics, exploring problems such as 'the new morality', the tension between justice and love, problems of the individual in sex, conscience, law, liberty, family life, and other temporal values. *(3 hours a week.)*

22(U). Biblical Theology: A study of great Biblical themes in the Old and New Testaments: God and Creation, Man and Sin, Law and Grace, Judgment and Salvation, Christology, the Kingdom of God, Body and Spirit, the Church and its Mission, the Resurrection and Consummation etc. (Prerequisite: Theology 12). Periodic seminars will be required. *(2 hours a week.)* (Discontinued, 1967).

24(U). Basic Christian Beliefs: Nature and function of theology will be examined and illustrated by reference to the practical significance of certain primary affirmations of the Christian Faith. Periodic seminars will be required. *(2 hours a week.)* (Not offered, 1967-68).

28(U). Understanding the New Testament: Introduction to the New Testament, including the Apocrypha and Dead Sea Scrolls, the life and teaching of Jesus, the early Christian Church. *(3 hours a week.)*

30(U). Christian Faith and Society: A study of moral responsibility in social problems on local, national and international levels: poverty, peace, technological developments; business and advertising, race relations, nuclear arms. Emphasis will be placed on historical Christianity as a significant force in society. *(3 hours a week.)*

37(U). Applied Christianity: The contemporary relevance of Christian ethics will be explored, the tension of love and justice, significant ethical stances in church history, specific problems such as sexuality and the family, international relations and nuclear armaments, race relations. Periodic seminars will be required. *(2 hours a week.)* (Discontinued, 1967).

38(U). Theology and Science: Science and scientific theory—religion and theology—their nature, relationship and mutual relevance with illustration drawn from the history and thought of each. Periodic seminars will be required. This course is specially orientated for science students. *(2 hours a week.)*

32. The Judaeo-Christian Tradition: A study of the understanding of the religious community, worship, theology and the religious calendar in modern Judaism and Christianity. Offered in Extension only. (Not offered in 1967-68). *(3 hours a week.)*

39. Theological Background of Modern Civilization: Formative ideas, with examples taken from Judaism, New Testament Christianity, the Middle Ages, the Renaissance, the Twentieth Century. Periodic seminars will be required. This course is specially orientated for Science students. *(2 hours a week.)*

Honours Courses

220. Christian Commitment Today: A biblical approach to Christian ethics, exploring problems such as 'the new morality', the tension between justice and love, problems of the individual in sex, conscience, law, liberty, family life, and other temporal values. *(3 hours a week.)*

222. Biblical Theology: A study of great themes in the Bible—such as God—Creation; man—sin; law—grace; christological titles in the New Testament; Pauline—Johannine themes. *(3 hours a week.)*

224. Theological Investigations of the Great Christian Mysteries: Depth study of the problem of God, the Trinity; Creation, Man, Evil, revelation of God to man in the Word; practical significance of certain primary affirmations of the Christian Faith. *(3 hours a week.)*

226. Renumbered 334 in 1967.

227. Christian Commitment Today: The necessity for a revealed morality—meaning of person, liberty, law, love, conscience, current problems facing contemporary man such as nuclear arms, family planning, race relations, temporal values, etc. *(3 hours a week.)* (Discontinued, 1967).

228. New Testament Theology: A literary analysis and a study of the great themes of the New Testament. *(3 hours a week.)*

324. Christian Doctrine: The nature and purpose of theology will be examined and illustrated by reference to the development of various Christian beliefs and their relationship to contemporary knowledge. *(3 hours a week.)*

330. Christian Faith and Society: A study of moral responsibility in social problems on local, national and international levels: poverty, peace, technological developments; business and advertising, race relations, nuclear arms. Emphasis will be placed on historical Christianity as a significant force in society. *(3 hours a week.)*

331. Nature and History of the Church: Nature and structure of the Church in the light of the history of ecclesiology and Vatican Councils I and II. A study of the evolution of the Church of Christ through its major historical developments such as: the Roman persecutions, the major heresies, the eastern schism, the protestant reformation, the French revolution and modern secularism. *(3 hours a week.)*

334. The Sacraments: Liturgical development and the nature of sacramentalism. A biblical and historical presentation. *(3 hours a week.)* (Formerly 226).

337. Basic Christian Ethics: Theological foundation for Christian action, main types of Christian ethics in the history of the Church, specific contemporary issues such as sexuality and family life, the Christian and the political and economic order, race relations, nuclear warfare. *(2 hours a week lectures, 1 hour a week seminar-tutorial.)* (Discontinued, 1967).

340. History of the Early Church to 500 A.D.: The development of the Church as an Institution from the post-apostolic era until the sixth century. Special attention will be paid to the relationship of the Church to the pagan and Christian Empires, the development of Christian institutions with particular reference to the first four Ecumenical Councils and Christian life and thought. The course emphasizes use of documents. *(3 hours a week., lectures and seminars.)* This course is offered by the Department of History.

435. Modern Approaches to Christian Unity: A study of the history of the Church in reference to the schisms and attempts at reunification of Christendom. Analysis of papal documents and World Council of Churches. Comparative religions treatment. *(3 hours a week.)*

438. Theology and Science: An examination of the fundamental nature of each discipline seen through their relationships and contrast. The theology and science of Aquinas, Luther, Calvin, Boyle, Newton, Darwin, Tillich, Buber. The doctrine of creation and a contemporary treatment of providence, miracle, the natural and the supernatural. *(3 hours a week.)*

441. Great Minds: A study of theological thought and ferment of the 19th and 20th centuries. *(3 hours a week.)*

ZOOLOGY

(See p. C-64).

SEMESTER-HOUR EQUIVALENTS

The following list has been compiled for the convenience of evaluating committees in institutions which employ a semester-hour credit system.

I. Grade 13 Subjects:

English, French, German, Greek, Italian, Latin, Spanish, Mathematics A 6

Chemistry, Physics, Biology (each) 4

Algebra, Geography, Geometry, History, Mathematics of Investment, Music, Trigonometry, Mathematics B (each) 3

II. University Subjects:

	Semester Credits
Anthropology	
10	6
28	6
31	6
32	6
228	6
331	6
332	6
Asian Studies	
10	6
20	6
Biology (see also Botany, Microbiology, Zoology)	
11	6
16a	4
28a	3
29b	3
30b	3
34	6
35	6
37a	3
38c	2
228a	3
229b	3
237a	3
330b	3
438c	3
442b	3
443	6
449b	3
Botany	
10	6
22a	3
22b	3
30a	3
30b	3
34	6
37a	3
222a	3
222b	3
334	6
400	4
430a	3
430b	3
437a	3
441b	3
Chemistry	
1	5
10	8
22	6
22z	4
23	6
23z	5
24	4
24y	2
33	6
33x	4
34	8
34x	6
36	6
36x	4
222	6
223	8
224	4
232	8
332	6
333	7
334	8
334x	6
335	5
336	8
336x	6
344	10
444	6
444x	4
446a	4
446b	4
449	12
450y	2
451y	2
456a	3
456b	3
464	6
464x	4
Drama	
10	6
22	6
25	6
28	6
34	6
38	6
222	6
228	6
335	6
338	6
425	6
434	6
Economics	
15	4
19	6
21	6
23	6
24	6
27a	3
27b	3
31	6
35	6
36	6
221	6
223	6
224	6
227a	3
227b	3
301	6
331	6
335	6
336	6
338	6
353	6
400	6
401	6
402	6
404	6
406	6
410	6
432	6
English	
5	6
15	6
20	6
21	6
24	6
25	6
26	6
27	6
30	6
31	6
32	6
33y	2
38	6
39	6
200y	3
201y	3
235	6
236	6
237	6
250	6
260	6
261	6
270	6
337	6
338	6
339	6
340	6
341	6
350	6
356	6
363	6
370	6
441y	2
450	6
451	6
459	6
460	6
461	6
463	6
464	6
470y	2
480	6
499y	3

	Semester Credits
Fine Art	
10	6
20	6
23	6
24	6
30	6
32	6
33	6
34	6
220	6
224	6
230	6
233	6
330	6
332	6
333	6
334	6
434	6
436y	3
437y	3
440	6
441	6
442	6
French	
A	6
2	6
4	10
11	6
12	6
13	6
14	6
22y	3
23y	3
27	6
31	6
37	6
260y	3
261y	3
270	6
375y	3
376b	3
378a	3
380	6
490	6
495	6
496y	3
Geography	
10	6
23	6
24	6
25	6
32	6
34	6
35	6
36	6
37	6
38	6

	Semester Credits
223	6
224	6
225	6
332	6
334	6
335	6
336	6
337	6
433	6
438	6
444	6
446	6
447	6
Geology	
10	6
11	5
20	6
22	6
23a	3
24b	3
25	6
36	6
37	6
38	6
German	
A	6
Ax	6
2	6
4	10
12	6
21	6
22y	3
23y	3
31	6
34	6
Greek	
A	6
2	6
4	10
12	6
37	6
322	6
History	
4	6
10	6
11	4
22	6
24	6
25	6
26	4
27	6
30	6
32	6
34	4
35	6

	Semester Credits
37	6
38	6
222	6
225	6
257	6
324	6
330	6
331	6
332	6
333	6
334	6
335	6
337	6
340	6
353	6
425	6
438	6
439	6
452	6
455	6
458	6
461	6
Home Economics	
10	6
25a	3
25b	3
27	6
30	6
31	6
37	6
Italian	
A	6
2	6
12	6
Latin	
A	6
2	6
4	10
12	6
21	6
22	6
24	6
25	6
26	6
31	6
35	6
38	6
222	6
224	6
225	6
331	6
332	6
333	6
338	6
450	6
451	6
463y	2

	Semester Credits
Mathematics	
1	6
2	6
1y	3
2y	3
3y	3
4a	3
4b	3
11	6
11a	3
11b	3
12b	3
13	6
15	6
20a	4
21	6
23	4
25	7
27a	2
27b	3
29a	3
30	8
31a	3
32a	3
32b	3
33b	3
35a	2
35b	3
37	6
40	4
221	6
227	6
229	8
254a	5
254b	5
300	6
330	8
331b	3
332	6
337	6
338a	3
338b	3
342b	3
354b	3
355b	3
399y	3
400	6
429b	3
431a	3
431b	3
435	6
444	6
448	6
449a	3
449b	3
450	6
451	6
453	6
499	6

	Semester Credits
Microbiology	
16b	3
26a	3
26b	3
31a	3
32b	3
33b	3
326a	3
326b	3
400	4
431a	3
432b	3
433b	3

	Semester Credits
Music	
1	6
10	6
11	6
12y	2
18	4
20	6
21	6
28	6
31	6
38	6
200	6
201y	3
202y	3
203y	3
221	6
222y	3
223y	3
228	6
229y	3
300	6
301y	3
302y	3
303	6
304	6
305y	3
331	6
333y	3
334y	3
335y	3
336	6
338	6
350	6
400	6
402y	3
403	6
404	6
406y	3
443y	3
444y	3
445y	3
447	6
450	6

	Semester Credits
Nursing	
1a	2
10y	2
30a	3
31	8
32b	2
33a	2
34	8
35	6
36b	2
37	4
38	5
39b	1

	Semester Credits
Philosophy	
15	6
19	4
21a	3
21	4
22	4
23	6
24	6
25a	3
25b	3
25	4
26	4
27	4
28	6
28b	3
29	4
30	6
31	6
32	4
34	6
35	6
36	6
37	6
38	4
39	6
221	6
224	6
228	6
323	6
327	6
332	6
334	6
336	6
411	6
426	6
430	6
431	6
435	6
438	6
439	6
447	6
462	6

	Semester Credits
Physical Education	
11	6
15	3
30	6
215	2
251c	3
252	6
253c	3
254	6
315	4
351a	3
352c	3
353c	2
354b	3
355	4
400a	3
400b	3
401a	3
402b	2
405b	3
407b	3
409b	3
413b	3
415a	3
420	3
444	8
450	9
451a	3
453a	4
457a	2
460b	2
461a	
462b	3
464b	3
466b	3
470	7

	Semester Credits
Physics	
1	5
10	8
11a	4
11b	4
13	8
21a	3
22	7
23	7
25b	2
26	8
29	4
31	6
34	6
36	6
39	4
222	7
223	7
255b	3
331	6
334	6

	Semester Credits
336	6
355	6
370	6
450	6
452a	3
454b	3
455	6
466a	3
467b	3
470	6

	Semester Credits
Political Science	
12	6
20	6
21	6
23	6
30	6
32	4
35	6
36	6
37	6
212	6
220	6
221	6
223	6
234	6
330	6
332	6
334	6
336	6
337	6
343	6
435	6
440	6
452	6
460	6
461	6

	Semester Credits
Psychology	
15	6
22	6
26a	3
26b	3
28	6
30	6
31	6
34	6
35a	3
222	6
225	6
228	6
230	6
231	6
320	6
327	6
332	6
333	6
334	6

	Semester Credits
353	6
410	6
429	6
450	6
451	6
452	6
454	6
455	6

Russian

A	6
Ax	6
2	6
4	10
12	6

Social Work

21	6
23	4
31	4
32	4
35	4
41	4
43	4
45	4

Sociology

12	6
23	6
24	6
25	6
27	4
29	4
31	6
35	6
37	6
224	6
225	6
229	6
331	6
335	6
337	6
400	6
410	6

Spanish

A	6
2	6
3	10
4	10
12	6
14	10
20	6
21	4
22y	3
25	6
30	6
31	6
32y	2
33	6
34	6
37	6
38	6
39y	2
220	10
221	6
222y	3
223y	3
225	6
322y	3
330	6
331	6
338y	3
374	6
380	6
490	6
495	6
496y	3

Speech

15y	2
20	4
24	4
30	4
32	4
220	6
330	6
424	6
432	6

Theology

10(R)	4
13(R)	4
18(R)	4
20(R)	6
24(R)	4
27(R)	6
28(R)	6
29(R)	6
30(R)	6
31(R)	6
33(R)	6
34(R)	6
10(A)	4
12(A)	4
20(A)	6
24(A)	4
28(A)	6
31(A)	4
34(A)	6
37(A)	4
10(U)	4
12(U)	4
18(U)	4
20(U)	6
22(U)	4
24(U)	4
30(U)	6
37(U)	4
38(U)	4
39	4
220	6
222	6
224	6
227	6
228	6
324	6
330	6
331	6
334	6
337	6
340	6
435	6
438	6
441	6

Zoology

10	6
22	6
30a	3
34a	3
35b	3
36	6
37	6
222	6
336	6
400	4
430a	4
434a	3
435b	3
437	6
444b	3
448b	3

THE FACULTY OF APPLIED SCIENCE

Essex Hall

FACULTY OF APPLIED SCIENCE

THE SENATE COMMITTEE ON APPLIED SCIENCE STUDIES

The Dean of Applied Science (Chairman); the President; the Vice-President; the Registrar (Secretary); the Associate Dean of Applied Science; the Heads of the Departments in the Faculty of Applied Science; two members of the Faculty of Applied Science elected to the Senate.

ACADEMIC REGULATIONS

I. Special Admission Requirements: (see also General Admission Requirements, p. B-5).

Grade 13 English, Mathematics A and B, Chemistry, Physics, with an overall average of 60%. An average of 60% is required in Mathematics and in Science. **OR** Preliminary Year Science.

II. General Regulations: see p. B-10 ff.

III. Particular Regulations:

1. The student must hand in all laboratory reports and specified homework assignments before he can present himself for the final examination.

2. The student must attend **all** laboratories unless he has special permission from his instructor or a medical certificate to account for his absence.

3. **Failure**

   A student who fails to gain a passing mark in more than four courses, with the total weight* not exceeding 15, or fails to gain a passing mark in more than three courses should the total weight exceed 15, fails his year and is not allowed to write supplementals. (A **course** means a semester or year course which receives a separate grade). He is required to repeat his year retaining credit in courses in which he obtained Class I standing and possibly other courses at the discretion of the Academic Standing Committee. For subjects taken outside the Faculty of Applied Science, see p. B-11.

   A student who fails to obtain a weighted* average of 55% before supplementals fails his year and the same conditions apply as in the above paragraph.

   *Weight, and weighted average, are determined according to:

   One lecture hour per semester is 1 unit weight.

   One laboratory hour or tutorial hour per semester is 0.5 unit weight.

4. **Repeated Year**

No student while repeating his year is allowed to take courses in the next higher year.

A student who is repeating his year must obtain a passing grade in each subject and a weighted average of 60% in the subjects of the repeated year. If a repeating student fails final exam(s) in January he may be asked to withdraw at the end of the first semester.

5. **Supplementals**

A student who has an overall 55% weighted final mark average and satisfies the other requirements of section 3, is allowed to write supplementals in failed courses.

Supplemental examinations in all Applied Science courses are offered in August only. Supplemental examinations must be written in all failed courses at the first opportunity and at the designated time and place.

The final grade after a supplemental will include the term mark for the year. Where laboratory work is not considered satisfactory some additional work in the laboratory portion of the course may be required at the discretion of the instructor and his department head.

A student who fails courses exceeding a weight of 9 or has failed more than two courses after supplementals fails his year; otherwise he may be allowed conditions. (See below).

If a student fails a supplemental in Fourth Year his case will be considered by the Academic Standing Committee.

6. **Conditions**

A condition is defined as a course or part of a course in which pass standing has not been obtained. Such courses should be repeated in their entirety but where time-tabling makes this impossible a student is allowed to "carry" the course by attending instructional sessions whenever possible and by self-study.

A condition must be cleared at the first time an examination in that subject is offered.

A condition may not be carried for more than one year. That is, a First Year subject cannot be carried into the Third Year, and a Second Year subject cannot be carried into the Fourth Year. If it is not cleared in that year the student must repeat the course or the entire year or otherwise fulfil the requirements on the decision of the Academic Standing Committee. No student is permitted to carry a subject into the next higher year unless he has tried the supplemental examination in that subject.

Supplementals are allowed in "condition" subjects provided that the total number of supplementals is within the restrictions described under "3. Failure", p. **D-2.**

In the case of Fourth Year students carrying a condition, if at any time during the fourth year a student and his instructor feel that the student is prepared to clear the condition, application may be made for a special examination in that subject (see p. B-12, par. 3, for regulations). Such examination will be subject to department heads' approval and must be written before March 1 subject to the usual fees. If a special examination is not passed then a supplemental (subject to the usual regulations) may be written in the Spring.

7. Grading

Candidates in the Engineering course will be ranked in order of merit in each year and in each subject in four classes: those who obtain 75% or over of the total number of marks will be placed in Class I (those who obtain 85% or over will be granted "honours with distinction"); those who obtain 66% to 74% will be placed in Class II; those who obtain 60% to 65% will be placed in Class III; those who obtain 50%, the minimum for pass, to 59%, will be placed in Class IV. Standing in general subjects will be indicated by letter grades as follows: A (75-100), B (66-74), C (60-65), D (50-59), F (below 50).

8. Requirements for Graduation

In order to present himself as a candidate for the Bachelor of Applied Science degree a student must have obtained a passing grade in all of the required and optional subjects and must have completed all other requirements. (See also p. B-13).

9. Honours Standing

A candidate will graduate with honours if he has fulfilled all the requirements above and if in addition he has obtained honours (75% or better) standing in his final year and one other undergraduate year.

10. Extracurricular Activities

Each student must report to his counsellor on all extra-curricular activities. A student who does not maintain a standing of 60% at any time during the year will be automatically suspended from major extracurricular activities (intercollegiate sports, holding office in Student Council, Engineering Society or other clubs which are active on an all-year basis), and possibly suspended from minor activities (intramural sports and all activities of a minor nature or short duration). A student who does not have a 60% average may not be a candidate for student government office or for the intercollegiate basketball team without special written consent of the Dean.

BACHELOR OF APPLIED SCIENCE

The Curriculum:

The engineering curriculum has been designed to offer students an education that is immediately valuable to them on graduation and which, at the same time, provides a foundation to accommodate their further education in industry or research.

While an engineer must work within the technologies of the times, he is also responsible for their continual development: the creation of new processes, structures, materials, machines. The flexibility demanded of him must be based upon proficiency in the physical sciences, and a confident ability to apply the sciences to the benefit of mankind. Therefore our engineering programs are founded upon a substantial content of mathematics, physics and chemistry; and our engineering subjects are taught with a view to familiarising the student with contemporary practice, and teaching him those methods of analysis, design and realisation which he will be able to apply to a continually developing discipline.

The aim of the engineer is to use natural resources for the betterment of society: he must, therefore, realise his duties to society and, as a prerequisite, appreciate how civilisations have developed to their present states. To provide that perspective, then, in which the engineer may see the meaning of his work, the curriculum includes a carefully developed program of humanities and social science.

The independent responsibility that we wish to see in practising engineers is impressed upon our students by an emphasis on assignments, the completion of which is made realistically possible through economical course load. Further, the student is assisted in his individual studies by a counselling program, which encourages a close and profitable student-teacher relationship.

NOTE: The curricula for Chemical, Civil, Electrical and Mechanical Engineering, and Engineering Materials, have been accepted by the Association of Professional Engineers of Ontario for purposes of registration of the graduates.

		First Semester		Second Semester	
FIRST YEAR (common to all Engineering courses)		Lect.	Lab.	Lect.	Lab.
English 15	(Gen. Lit. and Comp.)	3	0	3	0
Chem. 10	(Gen. Chem., Qualitative Analysis)	3	3	3	3
Math. 11a	(General Mathematics I)	2	2	0	0
Math. 12b	(Linear Algebra)	0	0	2	2
Math. 15	(Differential & Integral Calculus)	3	0	3	0
Phys. 11a	(Introduction to Mechanics)	3	1½	0	0
Phys. 11b	(Heat, Electricity & Magnetism)	0	0	3	3
C. E. 100	(Graphics & Descriptive Geometry)	0	3	0	3
C. E. 101b	(Engineering Mechanics)	0	0	3	1
G. E. 103a	(Engineering Analysis & Design)	3	0	0	0
G. E. 102	(Practical Experience) (see p. D-18).				

For descriptions of courses in the Faculty of Applied Science, see "Details of Subjects".

I. CHEMICAL ENGINEERING

The expanding chemical industry requires more and more chemical engineers to spearhead its operation. Students contemplating careers in Chemical Engineering can therefore look forward to employment opportunities in technical sales, plant and equipment design, process design and control, production, and basic research in such fields as fermentation, petroleum, synthetic plastics and detergents, protective coatings and a host of other related industries. The Chemical Engineering program is designed to give the student the basic requirements for such a future and allows him maximum opportunity to choose his field of interest.

The department laboratories are spacious, the equipment is modern and designed to illustrate all the up-to-date scientific principles used in Chemical Engineering practice. A considerable amount of highly specialized equipment, useful in special projects, particularly in the senior year and in post-graduate studies, is also available.

The Chemical Institute of Canada has accredited this course for the purpose of granting professional membership to its graduates. A Student Chapter of the C.I.C. is active on campus. This course has also been accredited by the Association of Professional Engineers of Ontario for purposes of registration of the graduates.

			First Semester		Second Semester	
Second Year			Lect.	Lab.	Lect.	Lab.
Philosophy	19	(Great Ideas in Western Civilization)	2	0	2	0
Math.	25	(Inter. & Vector Calc. Diff. Eqns.)	3	1	3	1
Math.	27a	(Linear Algebra)	2	0	0	0
Math.	27b	(Complex Variables)	0	0	3	0
Chem.	22z	(Quantitative Analysis)	2	1½	2	1½
Phys.	21a	(Wave Motion, Sound and Light)	2	1½	0	0
E. M.	200bx	(Intro. to Engineering Materials)	0	0	2	0
Ch. E.	201b	(Chemical Processes)	0	0	0	3
Ch. E.	202a	(Intro. to Thermodynamics)	2	1½	0	0
Ch. E.	205b	(Elementary Process Calculations)	0	0	2	1½
E. E.	202a	(Circuit Analysis I)	2	3	0	0
E. E.	206b	(Electronic Circuits I)	0	0	2	3
C. E.	201a	(Mech. & Properties of Materials)	2	1½	0	0
G. E.	102	(Practical Experience) (see p. D-18).				
Third Year						
Philosophy	29	(Science & Man in West. Civiliz.)	2	0	2	0
Chem.	23z	(Organic Chemistry)	2	3	2	0
Math.	35a	(Fourier Series, Part. Diff. Eqns.)	2	0	0	0
Math.	35b	(Numerical Analysis)	0	0	3	3
Ch. E.	301a	(Transport Phenomena I)	2	3	0	0
Ch. E.	301b	(Transport Phenomena II)	0	0	3	3
Ch. E.	302	(Thermodynamics II)	2	1	2	1
Ch. E.	303	(Instrumental Analysis)	1	3	1	3
Chem.	34x	(Physical Chemistry II)	3	0	3	0
G. E.	102	(Practical Experience) (see p. D-18).				

Fourth Year

Theology	39*		2	0	2	0
Economics	15	(Principles of Economics)	2	0	2	0
Math.	31a	(Probability and Statistics)	2	1	0	0
G. E.	400b	(Engineering Profession and Law)	0	0	2	0
Ch. E.	401	(Mass Transfer)	2	0	2	0
Ch. E.	411	(Mass Transfer Laboratory)	0	3	0	3
Ch. E.	404	(Kinetics)	3	0	3	0
Ch. E.	405	(Plant Design)	0	3	0	3
Ch. E.	499	(Senior Project)	0	6	0	6
Options			4-5	0	4-5	0

Options may be chosen from the following in consultation with the department:

Chem.	464x	(Surface Chemistry)	2	0	2	0
Chem.	33x	(Organic Chemistry)	2	0	2	0
Chem.	36	(Biochemistry)	2	0	2	0
Ch. E.	403b	(Process Dynamics and Control)	0	0	3	0
Ch. E.	506	(Applied Mathematics)	3	0	0	0
E. E.	307az	(Control Theory)	2	½	0	0
Ch. E.	502c	(Thermodynamics III)	3	0	0	0
Math.	338a	(Complex Variables)	3	0	0	0
Math.	227	(Modern Algebra)	3	1	3	1
I. E.	301a	(Intro. to Industrial Engineering)	2	3	0	0
I. E.	401a	(Engineering Economy)	2	2	0	0

and a choice from:

I. E.	301b	(Work Analysis & Measurement)	0	0	2	2
I. E.	302b	(Engin. Appl. – Probability & Statistics)	0	0	2	2
I. E.	401b	(Production Control & Management)	0	0	2	2

*or Theology 38 or other Humanities option.

II. CIVIL ENGINEERING

Civil Engineering comprises the conception, design, operation and maintenance of buildings, railroads, waterways, bridges, harbours, tunnels, water supply and purification systems, sewage collection and treatment facilities, hydraulic structures and water power developments. The Civil Engineering curriculum provides a diversity of applied course work to aid the student in selecting his major field of endeavour as well as a thorough background in the basic sciences and a broad understanding of the social sciences and humanities.

The Civil Engineering Department provides modern and comprehensive laboratory facilities in the following fields: Strength of Materials, Soil Mechanics, Hydraulics, Structures, Reinforced Concrete, Sanitary Engineering and Surveying.

A graduate in Civil Engineering from this University will be allowed the full reduction in time of apprenticeship according to Section 23 (a) of the Ontario Land Surveyor's Act. The apprenticeship will be two years instead of the usual four years, under articles with a practising surveyor, duly filed as required by Section 27 of the same Act.

This course has been accredited by the Association of Professional Engineers of Ontario for purposes of registration of the graduates.

			First Semester		Second Semester	
Second Year			Lect.	Lab.	Lect.	Lab.
Phil.	19	(Great Ideas in Western Civilization)	2	0	2	0
Econ.	15	(Principles)	2	0	2	0
Geol.	11	(Introductory Geology for Engineers)	2	1	2	1
Math.	25	(Interm. and Vector Calc., Diff. Eqns.)	3	1	3	1
Phys.	21a	(Wave Motion, Sound and Light)	2	1½	0	0
E.E.	202a	(Circuit Analysis I)	2	3	0	0
E.M.	200bx	(Introd. to Eng. Materials)	0	0	2	0
C.E.	200b	(Graphic Statics)	0	0	0	2
C.E.	201	(Mech. and Prop. of Materials)	2	1½	3	1½
C.E.	202	(Surveying and Photogrammetry)	2	2	2	2
G.E.	102	(Practical Experience) (see p. D-18).				
Third Year						
Phil.	29	(Science and Man in Western Civilization)	2	0	2	0
Math.	27a	(Linear Alg.)	2	0	0	0
Math.	27b	(Complex Var.)	0	0	3	0
Math.	35b	(Numerical Analysis)	0	0	3	3
M.E.	303a	(Introd. to Thermodynamics)	2	1½	0	0
M.E.	300ab	(Fluid Mechanics)	2	1½	2	1½
C.E.	300	(Structure Analysis + Design I)	3	2	3	2
C.E.	302	(Hydrology)	2	1½	1	1½
C.E.	303	(Soil Mechanics)	2	1½	2	1½
C.E.	304	(Reinforced Concrete)	2	1½	2	1½
G.E.	102	(Practical Experience) (see p. D-18).				

Fourth Year

Theology 39†		2	0	2	0
G.E. 400b	(Engineering Profession + Law)	0	0	2	0
C.E. 400	(Structural Analysis + Design II)	2	3	2	3
C.E. 401	(Surveying Camp)				
C.E. 402	(Advanced Hydraulics)	2	1½	2	1½
C.E. 403	(Foundation Engineering)	2	1	2	1
C.E. 404	(Transportation Engineering)	2	1½	2	0
C.E. 405	(Sanitary Engineering)	2	2	2	2
C.E. 406a	(Construction Methods, Machines)	2	0	0	0
C.E. 407	(Urban Planning)	1	0	1	0
C.E. 410b	(Essay and Seminar)				
Either C.E. 554c	(Treatment of Experimental Data)				
or Math. 31a	(Probability and Statistics)	2	1	0	0

For a student with a "B" average or better, who intends to proceed to graduate work, additional courses, chosen from those listed below, may be required as directed by the Department Head:

Math. 35a (Fourier Series, Part. Diff. Eqns.)

E.E. 203b (Electrical Energy Conversion I).

† or Theology 38 or other Humanities option.

III. ELECTRICAL ENGINEERING

The electrical engineer is one who practises the science and art of economically "directing the sources of electrical energy in nature for the uses and conveniences of man". He may design, manufacture, install, operate or sell electrical machinery and equipment, manage plants or promote engineering projects. Our curriculum gives the student a strong program in general education and a sound technical training — a foundation sufficiently fundamental to facilitate his placement in any branch of the wide field of Electrical Engineering which today ranges from microwave communications to central power-station generation and transmission.

The Electrical Engineering Department has well equipped laboratories for conducting practical instruction in the main fields of Circuit Theory and Measurements, Electronics, Energy Conversion, Communications, Control Systems and Switching Logic.

A contemporary approach is assured by the use of basic equipment rather than the installation of large, quickly outdated apparatus.

This course has been accredited by the Association of Professional Engineers of Ontario for purposes of registration of the graduates.

			First Semester		Second Semester	
Second Year			Lect.	Lab.	Lect.	Lab.
Phil.	19	(Great Ideas in Western Civilization)	2	0	2	0
Math.	25	(Inter. & Vector Calc., Diff. Eqns.)	3	1	3	1
Math.	27a	(Linear Algebra)	2	0	0	0
Math.	27b	(Functions of Complex Variable)	0	0	3	0
Phys.	21a	(Wave Motion, Sound & Light)	2	1½	0	0
E.M.	200bx	(Mechanics & Properties of Materials)	0	0	2	0
C.E.	201a	(Mechanics of Materials)	2	1½	0	0
Ch.E.	202a	(Intro. to Thermodynamics)	2	1½	0	0
E.E.	202a	(Circuit Analysis I)	2	3	0	0
E.E.	202b	(Circuit Analysis II)	0	0	2	3
E.E.	203b	(Electrical Energy Conversion I)	0	0	2	3
E.E.	206b	(Electronic Circuits I)	0	0	2	3
G.E.	102	(Practical Experience) (see p. D-18).				
Third Year						
Phil.	29	(Science & Man in Western Civilization)	2	0	2	0
Math.	35a	(Fourier Series, Part. Diff. Eqns.)	2	0	0	0
Math.	35b	(Numerical Analysis)	0	0	3	3
Ch.E.	301az	(Transport Phenomena I)	2	1½	0	0
E.E.	300	(Electromagnetic Theory)	2	2	2	2
E.E.	302	(Circuit Analysis III)	2	1½	2	1½
E.E.	303	(Electrical Energy Conversion II)	2	2	3	1½
E.E.	306	(Electronic Circuits II)	2	2	3	2
E.E.	307a	(Control Theory I)	2	2	0	0
G.E.	102	(Practical Experience) (see p. D-18).				

Fourth Year

Theo.	39 or option		2	0	2	0
Econ.	15	(Principles)	2	0	2	0
Math.	31a	(Probability & Statistics)	2	1	0	0
G.E.	400b	(Engineering Profession & Law)	0	0	2	0
E.E.	408a	(Electrical Transmission)	2	1½	0	0
E.E.	409b	(Communications)	0	0	2	3
E.E.	410	(Project & Seminar)	0	1½	0	1½
C.S.	310a	(Logic Design)	2	2	0	0
E.E.	405b	(Elect. Engg. Mats.)	0	0	2	1½

4 of the following courses (only 5 E.E. Courses offered in any one year):

E.E.	401c	(Physical Electronics)	2	1½ each
E.E.	403c	(Elect. Energy Conversion III)		
E.E.	407b	(Control Theory II)		
E.E.	411b	(High Frequency Electronics)		
E.E.	413c	(Pulse Circuits)		
E.E.	414a	(Power Systems)		
C.S.	311b	(Switching Theory)		

COMPUTER SCIENCE OPTION

First Year

Common to all Engineering.

Second Year

Common with Electrical Engineering.

			First Semester		Second Semester	
Third Year			Lect.	Lab.	Lect.	Lab.
Phil.	29	(Science & Man in West. Civil.)	2	0	2	0
Math.	35a	(Fourier Series, Part. Diff. Eqn.)	2	0	0	0
Math.	435	(Numerical Analysis)	3	0	3	0
Math.	331b	(Theory of Probability)	0	0	3	0
E.E.	302	(Circuit Analysis III)	2	1½	2	1½
E.E.	306	(Electronic Circuit II)	2	2	3	2
C.S.	300	(Computer Organization & Progr.)	2	0	2	2
C.S.	310a	(Logic Design)	2	2	0	0
C.S.	311b	(Switching Theory)	0	0	2	1½
E.E.	307a	(Control Theory I)	2	2	0	0
G.E.	102	(Practical Experience) (see p. D-18).				
Fourth Year						
Theology 39 or option			2	0	2	0
Econ.	15	(Principles of Economics)	2	0	2	0
G.E.	400b	(Engineering Profession & Law)	0	0	2	0
E.E.	300	(Electromagnetic Theory)	2	2	2	2
E.E.	413a	(Pulse Circuits)	2	1½	0	0
C.S.	400ab	(Advanced Programming I, II)	2	2	2	2
C.S.	410b	(Computer Design)	0	0	2	0
C.S.	411a	(Constructive Logic)	2	1	0	0
C.S.	412b	(Introduction to Automata Theory)	0	0	2	1
C.S.	420	(Project)	0	3	0	3
One full course (or equivalent) from the following:						
I.E.	402b	(Operations Research)	0	0	3	3
C.S.	401a	(System Theory)	3	0	0	0
E.E.	401c	(Physical Electronics)	2	1½	0	0
E.E.	407b	(Control Theory II)	0	0	2	1½
Math.	337	(Modern Algebra)	3	0	3	0
Math.	431ab	(Probability; Statistics)	3	0	3	0

INDUSTRIAL ENGINEERING OPTION

First Year

Common to all Engineering.

Second Year

Common with Electrical Engineering.

			First Semester		Second Semester	
Third Year			Lect.	Lab.	Lect.	Lab.
Phil.	29	(Science & Man in West. Civil.)	2	0	2	0
Math.	31a	(Probability & Statistics)	2	1	0	0
Math.	35b	(Numerical Analysis)	0	0	3	3
Psych.	454	(Industrial Psych.)	3	0	3	0
E.E.	302	(Circuit Analysis III)	2	1½	2	1½
E.E.	303	(Electrical Energy Conversion II)	2	2	3	1½
Ch.E.	301az	(Transport Phenomena I)	2	1½	0	0
E.M.	310a	(Engineering Metallurgy)	2	1½	0	0
I.E.	301a	(Intro. to Industrial Engineering)	2	3	0	0
I.E.	301b	(Work Analysis & Measurement)	0	0	2	2
I.E.	302b	(Engin. Applications of Prob. & Stat.)	0	0	2	2
G.E.	102	(Practical Experience) (see p. D-18).				
Fourth Year						
Theology 39 or option			2	0	2	0
Econ.	15	(Principles)	2	0	2	0
Bus.Ad.	15a	(Business Organ. & Management)	3	0	0	0
Bus.Ad.	15b	(Intro. to Financial Statements)	0	0	3	0
E.E.	306	(Electronics Circuits II)	2	2	3	2
E.E.	307a	(Control Theory)	2	2	0	0
C.S.	310a	(Logic Design)				
or						
E.E.	414a	(Power Systems)	2	2	0	0
G.E.	400b	(Engineering Profession & Law)	0	0	2	0
I.E.	401a	(Engineering Economy)	2	2	0	0
I.E.	401b	(Production Control & Management)	0	0	2	2
I.E.	402a	(Intro. to Systems Engineering)	2	3	0	0
I.E.	402b	(Operations Research)	0	0	3	3
I.E.	410b	(Project)	0	0	0	3

IV. MECHANICAL ENGINEERING

Due to the broad scope and almost unlimited number of specialties falling within the field of mechanical engineering, it becomes impossible to concentrate on specialized fields of study. A firm foundation in the basic sciences and mathematics is essential. This emphasis is also made necessary because increasing numbers of mechanical engineering graduates are being employed in research and development in government and industry, or going on to further studies at the post-graduate level. Upon graduation, the mechanical engineer has open to him a great variety of jobs, the following fields being a few examples: power plant and engine design, refrigeration and air conditioning, turbomachinery design, gas dynamics and aeronautics, production and general industrial engineering. Such fields as Business Administration may also be followed at the graduate level. Since many mechanical engineers advance to management positions in industry and take on social responsibilities within their communities, the broad education as provided by study of the humanities is deemed necessary. The Department of Mechanical Engineering has modern up-to-date laboratories for both undergraduate and graduate studies. Equipment of special interest includes a closed circuit wind tunnel for boundary layer research, a hydraulic servo lab for control work and a diesel engine test bed completely instrumented for energy balance as well as cylinder pressure readings.

This course has been accredited by the Association of Professional Engineers of Ontario for purposes of registration of the graduates.

			First Semester		Second Semester	
Second Year			Lect.	Lab.	Lect.	Lab.
Phil.	19	(Great Ideas in Western Civilization)	2	0	2	0
Math.	25	(Inter. & Vector Calc., Diff. Eqns.)	3	1	3	1
Math.	27a	(Linear Algebra)	2	0	0	0
Math.	27b	(Functions of a Complex Variable)	0	0	3	0
Phys.	21a	(Wave Motion, Sound and Light)	2	1½	0	0
C.E.	201	(Mechanics and Properties of Materials)	2	1½	3	1½
E.M.	200bx	(Introd. to Eng. Materials)	0	0	2	0
M.E.	200a	(Kinematics and Dynamics)	2	3	0	0
M.E.	200b	(Mechanics of Machinery)	0	0	2	3
E.E.	202a	(Circuit Analysis I)	2	3	0	0
E.E.	203b	(Electrical Energy Conversion I)	0	0	2	3
G.E.	102	(Practical Experience) (see p. D-18).				
Third Year						
Phil.	29	(Science & Man in Western Civilization)	2	0	2	0
Math.	31a	(Probability and Statistics)	2	1	0	0
Math.	35a	(Fourier Series, Part. Diff. Eqns.)	2	0	0	0
Math.	35b	(Numerical Analysis)	0	0	3	3
E.E.	206b	(Electronic Circuits I)	0	0	2	3
E.M.	310a	(Engineering Metallurgy)	2	1½	0	0
M.E.	300	(Fluid Mechanics I)	2	1½	2	1½
M.E.	301a	(Elasticity)	2	2	0	0
M.E.	301b	(Vibrations)	0	0	2	2
M.E.	303	(Introd. to Thermodynamics)	2	1½	2	1½
M.E.	304	(Principles of Heat Transfer)	2	1½	2	1½
G.E.	102	(Practical Experience) (see p. D-18).				

Fourth Year

Theology 39†		2	0	2	0
*Econ. 15	(Principles)	2	0	2	0
M.E. 401	(Engineering Design)	2	3	2	3
M.E. 403	(Engineering Thermodynamics)	2	3	2	3
M.E. 407a	(Control Systems)	2	2	0	0
M.E. 410b	(Project Laboratory)	0	0	0	3
G.E. 400b	(Engineering Profession and Law)	0	0	2	0

Electives chosen from the following:

C.E. 402 (Advanced Hydraulics)
M.E. 402 (Internal Combustion Engines)
M.E. 404 (Heating and Air Conditioning)
M.E. 405 (Power Plant Engineering)
M.E. 406a (Potential Flow Theory)
M.E. 408b (Gas Turbines)
M.E. 409 (Kinematics of Mechanisms)
Business Administration

For a student with a B average or better, who intends to proceed to graduate work, the electives may be chosen from Mathematics or the graduate course offerings. The choice of electives must be made in consultation with the Department Head.

† or Theology 38 or other Humanities option.

*Not required in 1966-67.

INDUSTRIAL ENGINEERING OPTION

First Year (Common to all Engineering).

Second Year (Common with Mechanical Engineering).

		First Semester		Second Semester	
Third Year		Lect.	Lab.	Lect.	Lab.
Phil. 29	(Science & Man in Western Civilization)	2	0	2	0
Math. 31a	(Probability & Statistics)	2	1	0	0
Math. 35b	(Numerical Analysis)	0	0	3	3
Psych. 454	(Industrial Psych.)	3	0	3	0
E.E. 206b	(Electronic Circuits I)	0	0	2	3
E.M. 310a	(Engineering Metallurgy)	2	1½	0	0
M.E. 303a	(Introd. to Thermodynamics)	2	1½	0	0
M.E. 306	(Mechanics of Fluids & Energy Transfer)	2	1½	2	1½
I.E. 301a	(Introd. to Industrial Eng.)	2	3	0	0
I.E. 301b	(Work Analysis & Measurements)	0	0	2	2
I.E. 302b	(Engin. Applic. of Probab. & Statist.)	0	0	2	2
Fourth Year					
Theology 39		2	0	2	0
Econ. 15	(Principles)	2	0	2	0
M.E. 401	(Engineering Design)	2	3	2	3
M.E. 407a	(Control Theory)	2	2	0	0
G.E. 400b	(Profession and Law)	0	0	2	0
Bus.Ad. 15a	(Survey of Bus. Organiz. & Manag.)	3	0	0	0
Bus.Ad. 15b	(Introd. to Financial Statements)	0	0	3	0
I.E. 401a	(Engineering Economy)	2	2	0	0
I.E. 401b	(Production Control & Management)	0	0	2	2
I.E. 402a	(Introd. to Systems Engineering)	2	3	0	0
I.E. 402b	(Operations Research)	0	0	3	3
I.E. 410b	(Project)	0	0	0	3

V. ENGINEERING MATERIALS

One of the most diversified and challenging avenues open to future scientists and engineers is offered in the study of materials. Technological progress is dependent on how successfully the materials engineer can produce materials that will meet the demands of designers of nuclear reactors, gas turbine power plants, jet and rocket motors and many other space-age products. In addition, the materials engineer is concerned with the development and fabrication of materials for traditional use in structures, machines, plants, etc.

The Engineering Materials curriculum is essentially that of a scientifically oriented metallurgical program providing basic education in non-metallic as well as metallic materials and is designed to give the student, interested in the broad areas of materials generally, a strong background in the physical sciences, engineering principles and professional subjects.

The laboratories contain the latest instruments and equipment for undergraduate and graduate instruction and research. Of particular interest are the following major items: an electron probe micro-analyzer; a Philips X-ray diffractometer with complete accessories; Leitz and Unitron metallographs and metallographic preparation and microscopy equipment; a materials testing laboratory including an Instron Universal testing machine; processing equipment including a Philips high frequency induction melting unit and other standard heat-treating equipment. In addition the Department has a well-equipped photographic laboratory.

This course has been accredited by the Association of Professional Engineers of Ontario for purposes of registration of the graduates.

			First Semester		Second Semester	
Second Year			Lect.	Lab.	Lect.	Lab.
Phil.	19	(Great Ideas in Western Civilization)	2	0	2	0
Math.	25	(Inter. & Vector Calc. Diff. Eqns.)	3	1	3	1
Math.	27a	(Linear Algebra)	2	0	0	0
Math.	27b	(Functions of a Complex Variable)	0	0	3	0
Phys.	21a	(Wave Motion, Sound and Light)	2	1½	0	0
Ch.E.	202a	(Introduction to Thermodynamics)	2	1½	0	0
Ch.E.	205b	(Elementary Process Calculations)	0	0	2	1½
C.E.	201	(Mechanics and Properties of Materials)	2	1½	3	1½
E.E.	202a	(Circuit Analysis I)	2	3	0	0
E.E.	206b	(Electronic Circuits I)	0	0	2	3
E.M.	200b	(Introduction to Eng. Materials)	0	0	2	3
G.E.	102	(Practical Experience) (see p. D-18).				
Third Year						
Phil.	29	(Science and Man in Western Civilization)	2	0	2	0
Math.	31a	(Probability and Statistics)	2	1	0	0
Math.	35b	(Numerical Analysis)	3	3	0	0
Math.	355b	(Diff. Eqns. and Special Functions)	0	0	3	0
Chem.	334	(Physical Chemistry II)	3	3	3	3
Phys.	36	(Modern Physics)	2	3	2	3
Phys.	331	(Thermodynamics)	2	0	2	0
E.M.	300	(Fund. Prop. of Materials)	2	3	2	3
G.E.	102	(Practical Experience) (see p. D-18).				

Fourth Year

Theology 39†			2	0	2	0
Econ.	15	(Principles)	2	0	2	0
Phys.	466a	(Solid State Physics)	3	0	0	0
C.E.	300	(Structural Anal. and Design I)	3	2	3	2
G.E.	400b	(Engineering Profession and Law)	0	0	2	0
E.M.	400	(Physical Metallurgy Principles)	3	3	3	3
E.M.	401b	(Advanced Mechanical Metallurgy)	0	0	2	3
E.M.	402	(Materials Technology)	2	0	2	0
E.M.	403	(Materials Research Project)	0	6	0	6

† or Theology 38 or other Humanities option.

DETAILS OF SUBJECTS

(For details of subjects taken by Engineering students and not listed below, see "Details of Subjects" in Faculty of Arts and Science or Faculty of Business Administration).

GENERAL ENGINEERING

G.E. 102. Practical Experience: Students in all branches of engineering are required to have, before graduation, practical work of a nature acceptable to the department concerned. Work done prior to admission to the University may be accepted.

Summer essays or reading assignments may be required in lieu of, or in addition to, practical work. Each student has the responsibility to make definite arrangements with his department head to clear this requirement.

In the senior year field trips may be required by departments, in which case the student is expected to pay the costs involved.

G.E. 103a. Engineering Analysis and Design: Historical introduction leading to a description of contemporary engineering. The principles of engineering analysis and design; illustrated with examples of engineering problems drawn from many disciplines. *(3 lectures a week, first semester.)*

G.E. 400b. Engineering Profession and Law: The development of the engineering profession; professional engineering associations, societies and services; the status of the engineer in the community; professional ethics. The duties and liabilities of engineers. The law and the engineer; contract law and specifications; preparation of specifications and engineering contract documents. *(2 lectures a week, second semester.)*

CHEMICAL ENGINEERING

Officers of Instruction:

Professors: Maurice Adelman, Ph.D. (Head of the Department).
Frank A. DeMarco, Ph.D.

Associate Professors: A. W. Gnyp, Ph.D.
R. A. Stager, Ph.D.

Assistant Professors: G. P. Mathur, Ph.D.
C. C. St. Pierre, Ph.D.

Ch.E. 201b. Chemical Processes: The study of unit processes in chemical engineering and their integration in some selected industries, taught through discussion, laboratory exercise and a research approach to the development of simple known chemical processes on a laboratory scale. *(3 hours a week, second semester; laboratory and discussion periods.)*

Ch.E. 202a. (M.E. 303a). Introduction to Thermodynamics: Fundamental concepts and definitions, First Law, physical properties, ideal and real gases, Second Law, entropy and Maxwell's Equations. *(2 lectures a week, 3 laboratory hours alternate weeks, first semester.)*

Ch.E. 205b. Elementary Process Calculations: Introduction to graphical methods. Stoichiometry, material and energy balances in chemical and metallurgical processes. *(2 lectures, one 3 hour laboratory on alternate weeks, second semester.)*

Ch.E. 301. Renumbered 301ab in 1967.

Ch.E. 301a. Transport Phenomena I: The simultaneous study of heat and momentum transfer; derivation of the diffusion equation, Laplace's equation, the Navier-Stokes equation and Bernoulli's equation; forced and free convection, laminar and turbulent flow; dimensional analysis; solution of the equations; radiative heat transfer. Laboratory periods embodying experiments and calculations to demonstrate practical problems in heat and momentum transfer. *(2 lectures, 3 laboratory hours a week, first semester.)*

Ch.E. 301az. Transport Phenomena I: Same as Ch.E. 301a but with reduced laboratory schedule. *(2 lectures, 1½ laboratory hours a week, first semester.)*

Ch.E. 301b. Transport Phenomena II: Practical heat transfer; design of heat transfer equipment. Pressure drop and energy requirement calculations, one and two phase systems. The physical separation of solids, screening, filtration, elutriation, fluidization. *(3 lectures, 3 laboratory hours a week, second semester.)*

Ch.E. 302. Chemical Engineering Thermodynamics II: The application of thermodynamic principles to chemical engineering practice. *(2 lectures, 1 tutorial a week, both semesters.)*

Ch.E. 303. Instrumental Analysis: Physico-chemical measurements used in industry, and the determination of properties. *(1 lecture, 3 laboratory hours a week, both semesters.)*

Ch.E. 401. Mass Transfer: Methods of solution of problems in distillation, extraction, gas absorption, leaching. Introduction to the general theory of transport phenomena. *(2 lectures a week, both semesters.)*

Ch.E. 403b. Process Dynamics and Control: Mathematical modelling, Laplace transform solution of differential equations, transfer functions, feedback control modes, open and closed loop transient response under various control modes, stability, applications to practical Chemical Engineering problems. *(3 hours a week, one semester.)*

Ch.E. 404. Chemical Engineering Kinetics: The rate equation, classification of chemical reactions. The ideal reactor concept. Design of batch reactors, backmix reactors, and plug flow reactors. Design considerations for multiple reactions. Introduction to the theory of catalysis. Physical factors in heterogeneous reactions. *(3 lectures a week, both semesters.)*

Ch.E. 405. Plant Design: Design of pilot plant and larger equipment. *(3 tutorial hours a week, both semesters.)*

Ch.E. 411. Mass Transfer Laboratory: Illustration of the principles of mass transfer operations through laboratory sessions arranged on an incentive basis. *(3 laboratory hours a week, both semesters.)*

Ch.E. 499. Senior Project: A full literature study on the technical factors involved in the establishing of a chemical industry. Directed experimental research. *(6 laboratory hours a week, both semesters.)*

CIVIL ENGINEERING

Officers of Instruction:

Professor: J. B. Kennedy, Ph.D. (Head of the Department).

Associate Professors: J. P. Hartt, M.S.C.E.
J. T. Laba, M.A.Sc.
C. MacInnis, Ph.D.

Assistant Professors: D. E. L. Maasland, Ph.D.
W. McVinnie, Ph.D.

Lecturers: *G. R. Montforton, M.A.Sc.
J. A. McCorquodale, M.Sc.

*On leave.

C.E. 100. Graphics and Descriptive Geometry: Lettering; use of instruments; applied geometry; orthographic projections; dimensioning; sectional views; threads and fasteners; tolerances; working drawings; reproduction of drawings; graphs and charts; simple nomographs; orthographic projection; auxiliary and oblique views; graphical solutions of problems involving points; lines and planes; intersections of solids and development of surfaces. *(3 laboratory hours a week.)*

C.E. 101b. Engineering Mechanics: Vector treatment of mechanics. Statics of particles; rigid bodies and their equilibrium; centroids and centres of gravity; analysis of structures; friction; moments of inertia; kinematics of particles and rigid bodies; kinetics of particles and rigid bodies, including work, energy, impulse and momentum. Emphasis on application to engineering problems. *(3 lectures, 1 laboratory hour a week, second semester.)*

C.E. 200b. Graphic Statics: Composition and resolution of forces; equilibrium polygon through two and three points; Maxwell diagram; Williot-Mohr diagram. *(2 laboratory hours a week, second semester.)*

C.E. 201. Mechanics and Properties of Materials: This course includes the topics described under C.E. 201a and C.E. 201b. *(2 lectures a week, first semester; 3 lectures a week, second semester; 3 laboratory hours alternate weeks, both semesters.)*

C.E. 201a. Mechanics and Properties of Materials: Study of stress-strain relations; elastic and inelastic behaviour of materials; statically determinate and indeterminate problems; stresses in spheres and closed cylinders; elementary plasticity and residual stresses. Introduction to: engineering requirements of materials; crystal structure; structural imperfections and atom movements, deformations of metals and polymers, mechanical behaviour of ceramic materials, thermal stability. *(2 lectures a week; 3 laboratory hours alternate weeks.)* (Renumbered 201 in 1967).

C.E. 201b. Mechanics of Materials: Members subjected to twist and bending; combined stresses; Mohr's circle of stress; beam deflection; continuous beams; energy method for deflection and indeterminate problems; buckling of members; riveted and welded connections. *(3 lectures a week; 3 laboratory hours alternate week.)* (Renumbered 201 in 1967).

C.E. 202. Surveying and Photogrammetry: A complete course in the theory of plane surveying, practical astronomy and the rudiments of aerial photogrammetry. Field problems and computations are provided in the laboratory periods to supplement the lectures. *(2 lectures, 2 laboratory hours a week.)*

C.E. 300. Structural Analysis and Design I: Determinacy of structures; analysis of statically determinate beams, frames and trusses, influence lines; maximum stress criteria, approximate analysis of indeterminate structures; slope and deflection of beams, frames and trusses. Introduction to design, risk and uncertainty in loads and materials strength properties. The problem of rational design. Development of codes and specifications. Behaviour, analysis and design of structural elements in metal. Design of members in tension, compression and bending, riveted and welded connections and simple structures. *(3 lectures, 2 laboratory hours a week.)*

C.E. 302. Hydrology: Hydrologic cycle. Precipitation, intensity-duration-frequency. Evapo-transpiration losses. Runoff, stream gaging, estimation from meteorological data. Storms, flood flows, rational and unit graph methods, flood routing, weather and water control. *(2 lectures a week, first semester; 1 lecture a week, second semester; 3 laboratory hours alternate weeks, both semesters.)*

C.E. 303. Soil Mechanics: Identification and classification of soils, index properties, water movement in soils, soil structure, compressibility and consolidation, shearing strength, stress analysis, stability of slopes, bearing capacity, settlement analysis, soil compaction and stabilization, site investigation. *(2 lectures a week, 3 laboratory hours alternate weeks.)*

C.E. 304. Reinforced Concrete: Stress analysis and design of reinforced concrete beams and columns; combined bending and axial load; ultimate strength and analysis; different floor systems of reinforced concrete building; introduction to prestressed concrete. Laboratory includes design problems and tests of physical properties of concrete and its component materials; design of concrete mixes. *(2 lectures, 3 laboratory hours alternate weeks.)*

C.E. 400. Structural Analysis and Design II: Analysis of statically indeterminate structures; work and energy; method of consistent deformation; influence lines; design and detail of a plate girder; slope deflection method; method of moment distribution; column analogy; buckling of beams; structural dynamics; laboratory includes design of an industrial building bent and a highway bridge deck with composite construction. *(2 lectures, 3 laboratory hours a week.)*

C.E. 401. Surveying Camp: A field course covering secondary triangulation; precise base line measurement; plane table topography, cross sectioning and earth work; and observation for time and azimuth. (See "Fees"). *(2 weeks.)*

C.E. 402. Advanced Hydraulics: Pressure conduits in series, parallel, branches and network. Water hammer. Waterways. Pumps and turbines, their characteristics and limitation. Gravity and arch dams. Weirs and outlet works. Laws governing hydraulic models. *(2 lectures a week, 3 laboratory hours alternate weeks and inspection trips.)*

C.E. 403. Foundation Engineering: Soil mechanics as applied to foundation engineering, bearing capacity of footings, coffer dams and caissons for bridges and buildings; piers, abutments and sheet piling; earth pressure and the design of retaining walls; pile driving and piled foundations; drainage prior to excavation. Design of road and airport runway foundations. *(2 lectures, 1 laboratory hour a week.)*

C.E. 404. Transportation Engineering: Highways; foundation soils, bases and subbases. Bituminous and portland cement concrete pavements. Geometric design of highways. Airports. Design standards for runways, aprons, taxiways. Soils in airport foundations. Airport pavement design. Railroads; alignment and grade elements, superelevation, turnouts, sidetracks and switching gear. *(2 lectures a week all year, 3 laboratory hours alternate weeks, first semester.)*

C.E. 405. Sanitary Engineering: A course in the theory of water and waste water treatment processes. The laboratory includes chemical analysis of water and sewage, design of water and sewage treatment plants and several field trips. *(2 lectures, 2 laboratory hours a week.)*

C.E. 406a. Construction Methods, Machines: Preliminary planning; estimating costs; site preparation; construction equipment and capacities for earthworks, rock excavation transportation; pumping, hoisting, conveying and concrete preparation; job management. *(2 lectures a week, one semester.)*

C.E. 407. Urban Planning: History of development of cities, various factors influencing the city plan and elements of proper city-planning. The Planning Act, the Department of Planning and Development, and local planning boards. Urban renewal, proper zoning and other legislation that can be employed to develop healthy communities. *(1 lecture a week.)*

C.E. 410b. Essay and Seminar: Detailed literature investigation of a project in civil engineering, the various details of which are to be discussed individually in seminar. The seminar discussions are to be compiled by each student in the form of a written essay to be submitted at the end of the fourth year.

ELECTRICAL ENGINEERING

Officers of Instruction:

Professor: P. A. V. Thomas, Ph.D. (Head of the Department).

Associate Professor: *H. R. Fletcher, M.A.Sc.

Assistant Professors: G. V. Venkatesulu, M.S.E.E.
O. P. Malik, Ph.D.
A. H. Qureshi, Ph.D.

Lecturers: J. J. Huschilt, M.A.Sc.
A. F. Pflanzner, B.A.Sc.
P. Alexander, M.A.Sc.

*On leave of absence.

E.E. 202a. Circuit Analysis I: Basic concepts. Laplace transforms. Loop and nodal analysis. Network theorems. Power and energy. Electrical bridges. *(2 lectures, 3 laboratory hours a week, first semester.)*

E.E. 202b. Circuit Analysis II: Transform analysis. Network equations. Initial conditions. Network functions. Two-port networks. *(2 lectures, 3 laboratory hours a week, second semester.)*

E.E. 203b. Electrical Energy Conversion I: Magnetic theory. 1 ph. transformers. D.C. machines. 3 ph. induction motor. *(2 lectures, 3 laboratory hours a week, second semester.)*

E.E. 206b. Electronic Circuits I: Basic concepts. Vacuum and semiconductor diodes and triodes. Graphical analysis. Equivalent circuits. Coupled amplifiers. Oscillators. Power supplies. *(2 lectures, 3 laboratory hours a week, second semester.)*

E.E. 300. Electromagnetic Theory: Static electric and magnetic fields, field mapping. Laws of Coulomb, Gauss, Ampere and Faraday. Resistance, capacitance and inductance. Maxwell's equations. *(2 lectures; 2 laboratory hours a week, both semesters.)*

E.E. 302. Circuit Analysis III: Network topology and equations. Fourier analysis and transform. Laplace transform. Network functions, pole-zero approach. Two port networks. One port reactive networks. Filters. Signal flow graphs. *(2 lectures a week, 3 laboratory hours alternate weeks, both semesters.)*

E.E. 303. Electrical Energy Conversion II: General theory of electromechanical energy conversion. Transformers, incremental-motion transducers. DC machines. Induction machines. Synchronous machines. AC commutating machines. Servomotors. Generalized rotating machine. Transfer functions and block diagram representation of electrical machines. Machine network analysis. *(2 lectures, 2 laboratory hours each week, first semester; 3 lectures a week, 3 laboratory hours alternate weeks, second semester.)*

E.E. 306. Electronic Circuits II: Steady state and transient response of amplifier circuits. Compensation. D.C. amplifiers. Power amplifiers. Multistage wide band and pass band amplifiers. Feedback and stability. Oscillators. Modulation and demodulation circuits. Power supplies. *(2 lectures, 2 laboratory hours a week, first semester; 3 lectures, 2 laboratory hours a week, second semester.)*

E.E. 307a. Control Theory I: Principles of feedback control. Error response. Stability. Transient response. Frequency response techniques. Root locus. Analogue computer. *(2 lectures, 2 laboratory hours a week, first semester.)*

E.E. 307az. Control Theory I: Same as E.E. 307a, but without experimental laboratory.

E.E. 401c. Physical Electronics: Introduction to quantum physics and statistical physics. Band structure. Theory of junction devices. Mobility and transport phenomenon in semiconductors. Electron emission and electron ballistics in vacuum tubes. *(2 lectures a week, 3 laboratory hours alternate weeks, either semester.)*

E.E. 403c. Electrical Energy Conversion III: Principles of energy conversion. Thermoelectric engine. Thermionic convertor. Magnetohydrodynamic engine. Photovoltaic effect and solar cells. Free energy and fuel cells. *(2 lectures a week, 3 laboratory hours alternate weeks, either semester.)*

E.E. 405b. Electrical Engineering Materials: Elements of quantum mechanics, Energy states; dielectric properties of insulators in static and dynamic fields; Magnetic properties of materials; conductivity of metals. *(2 lectures a week, 3 laboratory hours alternate weeks, second semester.)*

E.E. 406a. Electronic Circuits III: Multistage wide band and pass band amplifiers. Feedback and stability. Oscillators. Modulation and demodulation circuits. *(2 lectures, 3 laboratory hours a week, first semester.)* (Discontinued, 1967).

E.E. 407b. Control Theory II: Compensation; multiple loop systems; sampled data control systems; introduction to non-linear systems. *(2 lectures a week; 3 laboratory hours alternate weeks, second semester.)*

E.E. 408a. Electrical Transmission: Field concepts and distributed circuits. Transmission-line equations. Steady-state and transient waves on lossless line. Lossy lines. Transmission efficiency and impedance matching. Graphical methods of transmission line problems. *(2 lectures a week, 3 laboratory hours alternate weeks, first semester.)*

E.E. 409b. Communications: Information transmission. Noise. Communication system: modulation and demodulation, signal to noise ratio and comparative study of different systems. *(2 lectures, 3 laboratory hours a week, second semester.)*

E.E. 410. Project and Seminar: A project will be assigned to the student who will make a literature survey, design, construct and test the project, and finally present a written report on the project. *(3 laboratory hours alternate weeks, both semesters.)*

E.E. 411b. High Frequency Electronics: Guided waves. Modes and propagation in rectangular and circular wave guides. Resonators. Microwave generation, detection and measurement. Radiation. *(2 lectures a week, 3 laboratory hours alternate weeks, second semester.)*

E.E. 412c. Switching Systems: Switching algebra. Formulation of switching functions. Reduction methods. Circuit realization. Sequential circuits. *(2 lectures, 2 laboratory hours each week, either semester.)* (Replaced by C.S. 310a in 1967).

E.E. 413c. Pulse Circuits: Linear wave shaping with RC, RL and RLC circuits. Linear pulse amplifiers. Nonlinear wave shaping. Bistable, monostable and astable multi-vibrators. *(2 lectures a week, 3 laboratory hours alternate weeks, either semester.)*

E.E. 414a. Power Systems: Power transmission lines. System analysis. Protective systems. *(2 lectures a week, 3 laboratory hours alternate weeks, first semester.)*

COMPUTER SCIENCE OPTION

C.S. 300. Computer Organization and Programming: Logic basis of computer structure, machine representation of numbers and characters, flow of control, instruction codes, arithmetic and logic operations, indexing and indirect addressing, input-output, subroutines, linkages, macros, interpretative and assembly systems. Introduction to Symbolic, Fortran and Algol language systems. *(2 lectures and 2 laboratory hours a week.)*

C.S. 310a. Logic Design: Switching, algebra, formulation of switching functions, reduction methods, circuit realization. *(2 lectures and 2 laboratory hours a week in the first semester.)*

C.S. 311b. Switching Theory: Error detecting and correcting codes, majority logic, storage elements, threshold logic, basic sequential circuits, digital system design principles. *(2 lectures a week and 3 laboratory hours every alternate week in the second semester.)*

C.S. 400a. Advanced Programming I: Formal description and techniques of compilation of formal languages, e.g. Algol; Syntax, semantics, procedures, recursion etc. in these languages. Theory of compilers. Introduction to data processing. *(2 lectures and 2 laboratory hours in the first semester.)*

C.S. 400b. Advanced Programming II: Study of languages and grammars amenable to precise mathematical analysis. Relations between formal languages and computer languages. Application to computer language development, syntactic analysis and machine compilation. *(2 lectures and 2 laboratory hours a week in the second semester.)*

C.S. 401a. System Theory: Principles of Systems Theory and Cybernetics. Applications in science and applied science. *(3 lectures a week in the first semester.)*

C.S. 410b. Computer Design: Design of computer hardware: registers, adders, memory systems, input-output devices, hardware vs. software implementation etc. *(2 lectures a week for the second semester.)*

C.S. 411b. Constructive Logic: Introduction to logic and Boolean Algebra, set algebra, product sets, relations and functions, algebraic structures, propositional calculus, Algoriths. *(2 lectures and 1 laboratory hour a week in the first semester.)*

C.S. 412b. Introduction to Automata Theory: A discussion of various types of automata, e.g. finite, probabilistic, growing and reproducing automata. Representation of automata by regular expressions, state graphs, logical nets, recursive functions and Turing machines. *(2 lectures and 1 laboratory hour a week in the second semester.)*

MECHANICAL ENGINEERING

Officers of Instruction:

Professor: W. G. Colborne, M.Sc. (Head of the Department).

Visiting Professor: N. Rosenauer, D.Ing.

Associate Professors: H. J. Tucker, M.Eng.
A. A. Nicol, Ph.D.
K. Sridhar, Ph.D.
W. P. T. North, Ph.D.

Assistant Professors: Rev. A. R. Howell, C.S.B., M.A.Sc.
G. B. Babiy, M.Sc.
A. Raouf, M.S.I.E.

M.E. 200a. Kinematics and Dynamics: Kinematics and dynamics of the plane motion of rigid bodies and of relative motion. Velocity and acceleration analysis of mechanisms. *(2 lectures, 3 laboratory hours a week, first semester.)*

M.E. 200b. Mechanics of Machinery: Static and inertia forces in mechanisms, detailed analysis of the reciprocating engine. Kinematics of the cam and follower mechanism. Gear tooth profiles, gear trains. Balancing of rotating and reciprocating masses. *(2 lectures, 3 laboratory hours a week, second semester.)*

M.E. 300. Fluid Mechanics I: Fluid properties and definitions, fluid statics, basic flow concepts, and basic equations, dimensional analysis and similitude. Incompressible viscous flows, exact solutions of Navier Stokes equation, boundary layer equations, Blassius solution, open channel flow, compressible flow, adiabatic and isentropic flows, normal shock. *(2 lectures a week, 3 laboratory hours alternate weeks.)*

M.E. 300a, 300ax, 300b. Renumbered 300 in 1967.

M.E. 301a. Elasticity: Energy methods in elasticity theory; some problems involving flexure of beams and plates; axially symmetrical stress systems. *(2 lectures, 2 laboratory hours a week, first semester.)*

M.E. 301b. Vibrations: Vibrations with one degree of freedom; vibration of shafts and beams carrying discrete loads; vibrations of elastic bodies. *(2 lectures, 2 laboratory hours a week, second semester.)*

M.E. 303a. (Ch.E. 202a). Introduction to Thermodynamics: Fundamental concepts and definitions. First law. Physical properties. Ideal and real gases. The second law. Entropy and Maxwell's equations. *(2 lectures a week, 3 laboratory hours alternate weeks, first semester.)*

M.E. 303. Introduction to Thermodynamics: Fundamental concepts, first law, physical properties, ideal gases, real gases, the second law, reversible and irreversible processes and cycles, consequences of the second law, entropy, physical properties II, availability and irreversibility, gas and gas-vapour mixtures, chemical reactions: combustion. *(2 lectures a week, 3 laboratory hours alternate weeks.)*

M.E. 304. Principles of Heat Transfer: Fourier equation, steady and transient state conduction, forced and natural convection, boiling, heat transfer inside and outside of tubes, radiation, heat exchangers with solutions of practical problems. *(2 lectures a week, 3 laboratory hours alternate weeks.)*

M.E. 305b. Introduction to Heat Transfer: Fourier equation, steady state conduction, steady state conduction in bodies with heat sources, forced and natural convection, simple heat exchangers, heat transfer by radiation. *(2 lectures a week, 3 laboratory hours alternate weeks, one semester.)* (Discontinued, 1967).

M.E. 306. Mechanics of Fluids and Energy Transfer: Fluid statics. Basic concepts of fields, Transfer of mass, momentum and energy. Dimensional analysis. Laminar flows. Turbulent flows. Heat conduction. Convection. Radiation. Introduction to turbomachines. *(2 lectures a week, 3 laboratory hours alternate weeks.)*

M.E. 401. Engineering Design: The principles of machine design and the design of machine elements. Elements treated are: shafts, couplings, clutches and brakes, power screws, gears, lubrication and bearings, flexible machine elements and springs. *(2 lectures, 3 laboratory hours a week.)*

M.E. 402. Internal Combustion Engines: Thermodynamic principles, fuel-air cycles, combustion, fuels, carburetion and injection, supercharging, two and four stroke cycles. *(2 lectures a week, 3 laboratory hours alternate weeks.)*

M.E. 403. Engineering Thermodynamics: Compressible flow, steam power cycles, air compression, refrigeration with applications to air conditioning, gas power cycles, internal combustion engines, steam nozzles and turbines. *(2 lectures and 3 hours laboratory a week.)*

M.E. 404. Heating and Air Conditioning: Physiological principles, heating and cooling loads, heating and cooling methods and equipment, air systems, steam and water systems, fuels, chimney and draft calculation, refrigeration, evaporative cooling, cooling towers, industrial ventilation. *(2 lectures a week, 3 laboratory hours alternate weeks.)*

M.E. 405. Power Plant Engineering: Application of the laws of thermodynamics, fluid flow, and heat transfer to the economic conversion of energy. Topics include, stationary power plants, nuclear power plants, and more recent development in energy conversion for powering space vehicles. *(2 lectures a week, 3 laboratory hours alternate weeks.)*

M.E. 406a. Potential Flow Theory: Basic equations of perfect fluid flow in three dimensions, conservation of circulation, examples of potential flow, vortex motion, two-dimensional flow in greater detail, aerofoil theory in two and in three dimensions, influence of compressibility. *(2 lectures a week, and 3 laboratory hours alternate weeks, first semester.)*

M.E. 407a. Control Systems: Control system concepts, system components. Steady-state and transient analysis. Stability, system design: frequency response, root-locus and analogue simulation methods. *(2 lectures, 2 hours laboratory a week, first semester.)*

M.E. 408b. Gas Turbines: Gas dynamics, shock, cycles, energy transfer between fluid and rotor, diffusers, design and blade cascade data, compressor and turbine matching, applications. *(2 lectures a week, 3 laboratory hours alternate weeks, second semester.)*

M.E. 409. Kinematics of Mechanisms: Kinematic pairs. Kinematic chains. Plane motion. The Euler-Savary equation and its graphical representation. The Bobillier constructions. Straight line motion. Velocity. Acceleration. Relative motion of three planes. Relative motion of four planes. Kinematic chain of n-links. General methods of velocity construction. General methods of acceleration construction. Methods of synthesis of mechanisms. *(2 lectures, 2 hours laboratory a week.)*

M.E. 410b. Project Laboratory: Each student working either individually or in a small group shall undertake a project in the laboratory. The projects shall be assigned or if a student wishes to undertake a project of his own choice, such a project must be approved by the Department Head. The project may take the form of a written essay with the permission of the Department Head. *(Half course).*

INDUSTRIAL ENGINEERING OPTION

I.E. 301. Renumbered 301ab in 1967.

I.E. 301a. Introduction to Industrial Engineering: Plant organization and management. Definition of management problems. Techniques of solutions, including organization analysis, product development, plant layout, the use of models for comparisons of alternatives. Considerations of the organization through systems approach. *(2 hours lectures and 3 hours laboratory, first semester.)*

I.E. 301b. Work Analysis and Measurement: The work system, work simplification, operations analysis, methods improvement. A survey of work measurement, work sampling. Applications to many areas such as business concerns, the home, hospitals, etc. Motion and time study, incentive pay systems. Each area is covered with specific problems. *(2 hours lectures and 2 hours laboratory, second semester.)*

I.E. 302b. Engineering Applications of Probability and Statistics: Application of probability and statistical theory to problems of sampling, experimental analysis, tests of hypothesis, Baysian Interferences. Introduction to analysis of variance. *(2 hours lectures and 2 hours laboratory, second semester.)*

I.E. 401a. Engineering Economy: Engineering decision making viewed from a cost point of view. This will include cost finding, decision under uncertainty, forecasting, replacement, taxes. *(2 hours lectures, 2 hours laboratory, first semester.)*

I.E. 401b. Production Control and Management: Methods of planning and controlling production. Cost factors, determination of lot size, influence of uncertainty, forecasting, control of production loads, program evaluation and review techniques. *(2 hours lectures, 2 hours laboratory, second semester.)*

I.E. 402. Renumbered 402ab in 1967.

I.E. 402a. Introduction to Systems Engineering: Systems concept. Systems design and analysis as applied to industrial engineering. Improvement of the integrated systems of men, materials and equipment. Extensive use of digital computers will be made in simulating systems. *(2 hours lectures, 3 hours laboratory, first semester.)*

I.E. 402b. Operations Research: An introduction to mathematical decision making in engineering management. Construction of mathematical models. Techniques of solution. Topics covered will include inventory control, production control, linear programming, dynamic programming, queuing theory, game theory, etc. *(3 hours lectures, 3 hours laboratory, second semester.)*

I.E. 410b. Project Laboratory: Each student working either individually or in a small group will undertake a project in the laboratory. The project will be assigned or if a student wishes to undertake a project of his own choice, such a project must be approved by the Department. The project may take the form of a written essay with the permission of the Department Head.

ENGINEERING MATERIALS

Officers of Instruction:

Professors: R. G. Billinghurst, M.A.Sc. (Head of the Department).
J. Gordon Parr, Ph.D.

Associate Professor: W. V. Youdelis, Ph.D.

E.M. 200b. Introduction to Engineering Materials: The fundamental principles of the structure of matter as applied to engineering materials such as metals and alloys, ceramics, natural and synthetic polymers and elastomers and concrete. *(2 lectures, 3 laboratory hours a week, second semester.)*

E.M. 200bx. Introduction to Engineering Materials: Same as E.M. 200b, but without laboratory.

E.M. 300. Fundamental Properties of Materials: Atomic structure; states of aggregation; crystal structures; the metallic bond; solidification; dislocations in crystals; alloying theory; phase diagrams; influence of composition, plastic deformation and heat treatment on structure and on properties; precipitation hardening. Metallographic laboratory techniques, polishing, etching, photomicrography. *(2 lectures, 3 laboratory hours a week.)*

E.M. 310a. Engineering Metallurgy: Application of the principles of physical metallurgy to the consideration of the constitution, microstructure, heat treatment, properties and uses of ferrous and non-ferrous metals and alloys. Laboratory includes the use of the metallurgical microscope, polishing, etching, demonstration of the principles of solidification, cold working and heat treatment of metals. *(2 lectures, 3 laboratory hours alternate weeks, first semester.)*

E.M. 400. Physical Metallurgy Principles: Thermodynamics and kinetics of metallurgical systems and processes; crystallography; production and properties of x-rays, x-ray diffraction techniques for crystal structure determination; theory of diffusion and diffusion controlled transformations; solidification theory, segregation, and zone solidification; electron theory of metals, electronic configuration and nature of metallic bond, semiconductors and superconductors. Laboratory: selected problems to illustrate principles. *(3 lectures, 3 laboratory hours a week.)*

E.M. 401b. Advanced Mechanical Metallurgy: Advanced dislocation theory and its application to the mechanical behaviour of metals; theories of plastic flow, ductile and brittle fracture, internal friction, and residual stress; metalworking principles. Laboratory: selected problems and metalworking projects to illustrate principles; determination of elastic and plastic parameters of various metals, compounds, and composites. *(2 lectures, 3 laboratory hours a week, second semester.)*

E.M. 402. Materials Technology: Commercial metals and alloys, precipitation hardenable non-ferrous alloys (aluminum, titanium, copper), precipitation hardenable high temperature and stainless steels; composites, new fabrication techniques — continuous casting, welding, powder metallurgy, flame spraying; corrosion and corrosion prevention. *(2 lectures a week.)*

E.M. 403. Materials Research Project: Materials research project related to current graduate research; e.g. alloy transformation, solidification of metals (segregation), powder metallurgy, metal composites, constitution of alloys, amalgam metallurgy, electric and magnetic properties of metals and alloys, etc., electrowinning processes — fused salts, aqueous and nonaqueous electrolytes, etc. *(6 laboratory hours a week.)*

SEMESTER-HOUR EQUIVALENTS

The following list has been compiled for the convenience of evaluating committees in institutions which employ a semester-hour credit system.

I. Grade 13 subjects:

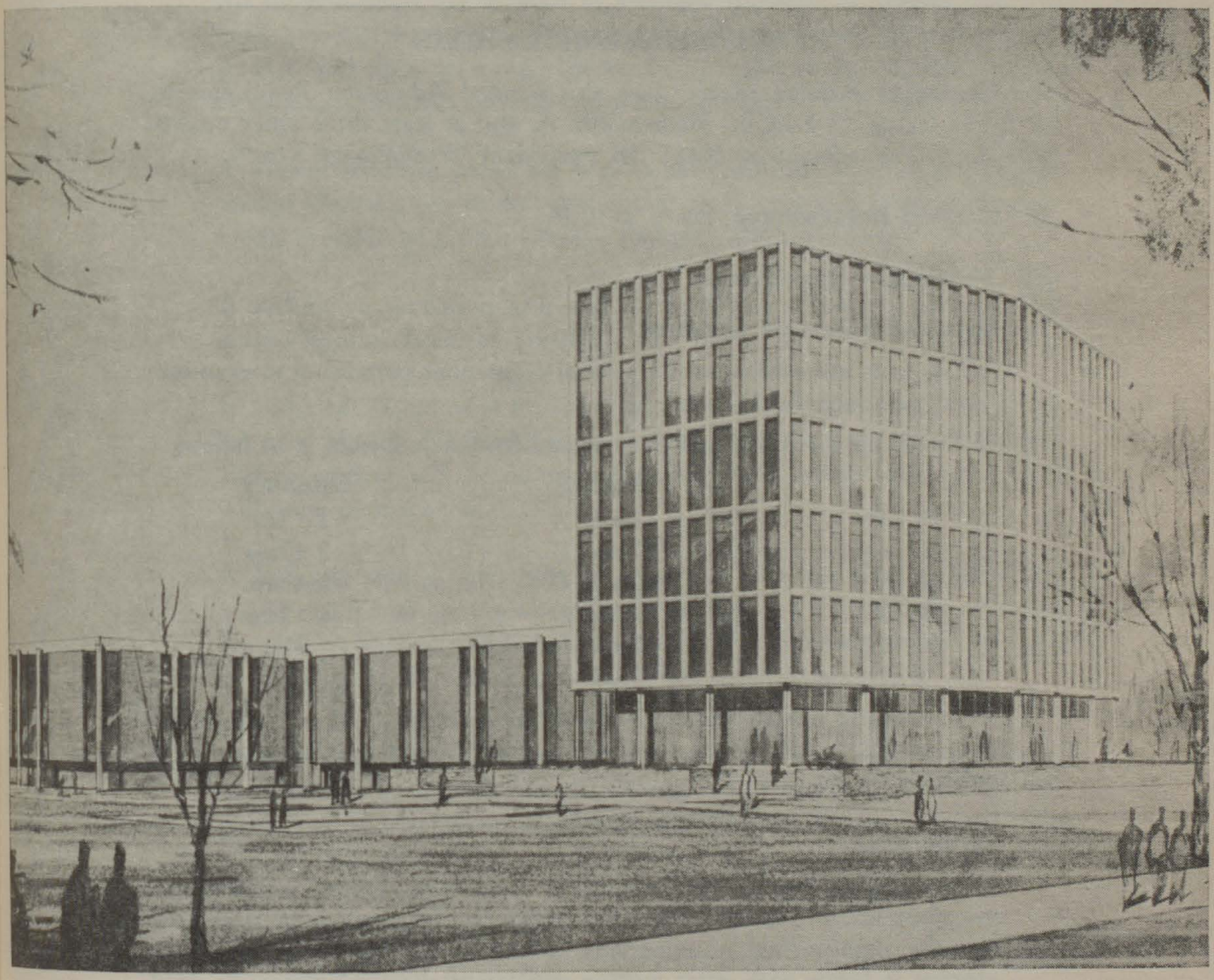
English, French, German, Greek, Italian, Latin, Spanish, Mathematics A	6
Biology, Chemistry, Physics	4
Algebra, Geography, Geometry, History, Mathematics of Investment, Mathematics B, Music, Trigonometry	3

II. University subjects:

Engineering

	Semester Credits		Semester Credits		Semester Credits
GE102		CE404	5	EM402	4
GE103a	3	CE405	5	EM403	2
GE400b	2	CE406a	2	ES400	6
ChE201b	3	CE407	2	ES401	5
ChE202a	3	CE410b	2	IE301	6
ChE205b	3	EE200a	3	IE401a	3
ChE301	6	EE203b	3	IE401b	3
ChE302	5	EE206b	3	IE402	3
ChE303	4	EE300	5	IE410b	
ChE401	4	EE302	5	ME200a	3
ChE404	6	EE303	7	ME200ax	2
ChE405	3	EE306	6	ME200b	3
ChE411	2	EE307a	3	ME300a	3
ChE499	4	EE401c	3	ME300ax	2
CE100	2	EE403c	3	ME300b	3
CE101b	4	EE406a	3	ME301a	3
CE200b	1	EE408a	3	ME301b	3
CE201	5	EE409b	3	ME303a	3
CE201a	3	EE410	1	ME303	5
CE201ax	2	EE411b	3	ME304	5
CE201b	4	EE412c	3	ME305b	3
CE202	6	EE413c	3	ME401	6
CE300	8	EE414b	3	ME402	5
CE302	4	EM200b	3	ME403	6
CE303	5	EM200bx	2	ME404	5
CE304	5	EM300	6	ME405	5
CE400	6	EM310a	3	ME406a	3
CE401	3	EM310b	3	ME407a	3
CE402	5	EM400	8	ME408b	3
CE403	5	EM401b	3	ME409	6

THE FACULTY OF BUSINESS ADMINISTRATION



Windsor Hall

THE FACULTY OF BUSINESS ADMINISTRATION

THE SENATE COMMITTEE ON BUSINESS ADMINISTRATION STUDIES

The Dean of Business Administration (Chairman); the President, the Vice-President; the Registrar (Secretary); the Associate Dean of Business Administration; three elected representatives of the Faculty of Business Administration; one representative from the Faculty of Arts and Science, to be designated by the Dean of Arts and Science.

ACADEMIC REGULATIONS

I. Admission requirements: (see also General Admission Requirements, p. B-5). Grade 13 English, Mathematics A, and at least three other credits, with an overall average of 60%; OR equivalent "Preliminary Year".

II. General Regulations: See p. B-10 ff.

III. Particular Regulations

(a) **Examinations and Grading**

All students are subject to the general regulations pertaining to examinations (see page B-11).

The grading for individual general and honours subjects is as follows:

	General	Honours
75-100:	Grade A	1 Class
66- 74:	Grade B	2 Class
60- 65:	Grade C	3 Class
50- 59:	Grade D	4 Class
40- 49:	Grade Fx	F
0- 39:	Grade F	F

At the regular Spring Examinations all grades below 50% are considered failures. If a student is permitted a supplemental examination, it is indicated by Fx.

(b) **Promotion:**

If the student has an average of at least 50% before supplemental examinations, and has not failed more than two full courses, he is allowed to write supplemental examinations in general courses. If the student's average is below 55% after writing supplemental examinations, he must repeat the year or withdraw from the Faculty. If his average after supplemental examinations is between 55% and 60%, he may continue for one year on probation, and must obtain in that probationary year an overall average of 60% and an average of 60% in the Honours courses, in order to continue further. In a repeated year, the student must obtain an overall average of 60% and an average of 60% in the Honours courses, or withdraw from the Faculty.

(c) **Failure:** To pass a subject a student must obtain an average of 50% on term work and examinations. Term work in a course will not be credited to a student beyond the year in which the course is taken. A failed course may be repeated once only.

No supplementals are allowed in Honours subjects. A student who has been granted the privilege of a supplemental examination in a general course, and fails to obtain 50% in it, will not be eligible for re-examination without a further year's attendance in the course.

A student who has failed his year is not permitted to write any supplemental examinations on the work of that year, but will be allowed to retain credit in subjects in which he has obtained 60% or better.

A student on probation who fails his year may not repeat the year, but must withdraw from the Faculty.

If a student is required to withdraw for academic reasons for one year, he may petition for readmission at the end of the year; if readmitted, such a student will be on probation, and must obtain a C average or withdraw permanently.

A full-time student who fails his year and who has already failed any year (either here or elsewhere), will be required to withdraw from the Faculty. A student who has been required to withdraw a second time will not be eligible for readmission under any conditions.

(d) **Graduation:** In order to be admitted to the Bachelor's degree, the student must obtain an overall cumulative average of 60% in the four years' work, and a cumulative average of 60% in the Honours courses. For general requirements, see page B-13.

IV. Extracurricular Activities

Each student must report to his counsellor on extra-curricular activities. A student who does not maintain a standing of 60% at any time during the year will be automatically suspended from major extra-curricular activities (intercollegiate sports, holding office in Student Council, or any club which is active on an all-year basis), and possibly suspended from minor activities (intramural sports and all activities of a minor nature or short duration).

BACHELOR OF COMMERCE

The purpose of the Bachelor of Commerce course is to develop educated men and women with a grounding in business ideas and techniques which will help equip them for positions of responsibility in industry and commerce. The course is designed to provide the broad outlook needed in modern business. In line with this objective, the first two years of the course emphasize the humanities and the social and physical sciences; the last two years provide for concentration in the Business Administration subjects.

The Faculty of Business Administration stresses general procedures and methods of attack on problems. Students are guided towards independent study and they are encouraged to grapple with business problems on their own. The program is designed to give students an awareness of the position and significance of business in the world today.

The Institute of Chartered Accountants of Ontario grants graduates of the Bachelor of Commerce course exemption of three years towards the C.A. course of study, as well as exemption from the primary examination.

The Michigan State Board of Accountancy accepts graduates of the course, with a major in accounting, for the Certificate of Examination.

For information on the Commercial Specialists Teaching Certificate, consult the Dean or the Registrar.

HONOURS BUSINESS ADMINISTRATION

First Year

Bus. Ad. 15a (Business Organization and Management)
Bus. Ad. 15b (Introduction to Financial Statements)
Economics 19* (Principles of Economics)
Mathematics 13 (Calculus & Linear Algebra)
English 15, Library Science
Two full courses from Arts and Science

*Economics 15 may be accepted at the discretion of the Dean of the Faculty of Business Administration.

Second Year Honours

Bus. Ad. 225 (Statistical Methods in Business)
Bus. Ad. 231 (Principles of Marketing)
Bus. Ad. 250 (Principles of Accounting)
One of: Economics 221 (Pricing Theory and Policy)
Economics 223 (Money and Banking)
English 21
One full course from the Faculty of Arts and Science

Third Year Honours

Bus. Ad. 340c (Production Management)
Bus. Ad. 346 (Personnel Management and Industrial Relations)
Bus. Ad. 373 (Business Finance)
One of: Bus. Ad. 350 (Intermediate Accounting)
Bus. Ad. 360 (Management Accounting)

Two and one-half courses (not more than one of which may be a general course) selected from the following, or from Arts and Science courses:

Bus. Ad. 325c (Computers and Systems Analysis)
Bus. Ad. 332c (Advertising)
Bus. Ad. 333c (Sales Management)
Bus. Ad. 334c (Consumer Market Behaviour)
Bus. Ad. 396 (Commercial Law)
Fourth Year option in Business Administration

Fourth Year Honours

Bus. Ad. 490 (Business Policy)

Five full courses (not more than two of which may be general courses) selected from the following, or from courses in the Faculty of Arts and Science:

Bus. Ad. 432c (Retailing)
Bus. Ad. 433c (Market Research)
Bus. Ad. 435c (International Marketing)
Bus. Ad. 446c (Administrative Practices)
Bus. Ad. 448c (Labour Law, Industrial Legislation)
Bus. Ad. 449c (Collective Bargaining)
#Bus. Ad. 450c (Advanced Accounting)
#Bus. Ad. 451c (Taxation)
#Bus. Ad. 460c (Auditing)
Bus. Ad. 473 (Investment Fundamentals & Portfolio Management)
Bus. Ad. 491c (Business Conditions)
Bus. Ad. 492 (Business Research)
Bus. Ad. 463c (Finance: Working Capital)
Bus. Ad. 464c (Finance: Long-term Financial Management)
#Bus. Ad. 470c (Cost Accounting)
Any third year Business Administration course not previously taken.

#Required for those intending to qualify for the three-year exemption towards the Chartered Accountants' course of study.

The Arts and Science options in Second, Third and Fourth Years are to be chosen with the approval of the Dean of the Faculty of Business Administration, to fulfill the desired sequence and concentration in the chosen fields. In any case, the courses chosen in Third and Fourth Year must be Second Year level or higher. Options outside the Faculty of Arts and Science may be taken with the approval of the Dean of Business Administration.

NOTE: The total number of courses required for the Honours Bachelor of Commerce degree is twenty-four; the student must complete a minimum of ten full courses in Business Administration and a minimum of ten outside the Faculty of Business Administration. Of the twenty-four courses required for the Bachelor's degree, at least thirteen must be Honours courses.

CERTIFICATE IN BUSINESS ADMINISTRATION

First Year

Business Administration 15ab	(1 evening a week, 3 hours)
Economics 15 or 19	(1 evening a week, 2 hours)

Second Year

Business Administration 250	(1 evening a week, 3 hours)
Business Administration 346	(1 evening a week, 3 hours)

Third Year

Any two full-year senior Business Administration subjects not already taken (2 evenings a week, 3 hours each).

This program may be pursued only in the Evening Division. The minimum time for completion is three years; it may be spread over a longer period if the student wishes. These courses may be applied towards a Bachelor of Commerce degree.

If the candidate is under twenty-five years of age, he must have admission requirements as listed on page B-7; if he is twenty-five years of age or over, and does not have these regular admission requirements, he may be admitted to the program if he has had business experience.

For the Certificate in Business Administration an overall "C" average in the six courses is required. Supplemental examinations may not be written in any subjects which are to be counted for the certificate. In the event that an applicant has completed equivalent courses elsewhere, he may substitute other courses with the consent of the Dean of Business Administration.

For Certificate in Public Administration, see "Faculty of Arts and Science".

DETAILS OF SUBJECTS

(For details of subjects taken by Commerce students and not listed below, see "Faculty of Arts and Science").

Officers of Instruction:

Professors: G. R. Horne, Ph.D. (Dean of the Faculty).
M. Zin, Ph.D.
C. M. Birch, Ph.D.

Associate Professors: J. B. Gertz, M.B.A.
J. M. Brownlie, M.B.A.
E. M. Basic, Ph.D.

Assistant Professors: P. B. Buchan, M.Comm.
*M. D. Beckman, M.B.A.
J. A. Murray, Ph.D.
R. W. Stolar, M.B.A., C.A.

Sessional Instructors: A. M. Barat, LL.B.
S. Berbynuk, M.B.A.
K. M. Fleming, B.Sc., C.A.
R. A. Habermas, M.B.A.
C. A. MacLean, M.B.A., C.P.A.
R. W. Meanwell, B.A., F.C.A.
R. J. Murphy, J.S.D.
A. B. Weingarden, B.A., Barrister-at-Law
D. A. Wilson, M B.A., C.A.

*On leave.

15a. A Survey of Business Organization and Management: A survey of the functional areas of business: production, marketing, personnel and industrial relations, statistics, accounting and finance. *(3 hours a week, one semester; half course.)*

15b. Introduction to Financial Statements: The principles underlying the construction of financial statements. *(3 hours a week, one semester; half course.)*

Business Administration 15ab is a prerequisite for all other courses in Business Administration except 24a.

24a. Introduction to the Personnel Function: A survey of the administrative organizations of a personnel department; the conduct of union-management relationships, and the development of favourable human relations in a service organization. Open only to students proceeding to a degree or diploma in nursing. *(2 hours a week, one semester; half course.)*

Honours Courses

(Former numbers are in parenthesis)

225 (255). Statistical Methods in Business: Descriptive and inductive statistics: moments, distributions, tests of hypotheses, correlation and time series analysis. Bayesian statistics: decisions under uncertainty, probabilities, and the sampling of measured values. *(2 lectures, 2 laboratory hours a week.)*

231 (251). Principles of Marketing: An introduction to the major problems of management in moving goods from the producer to the consumer. The development of skill in weighing alternatives and reaching mature decisions is a significant objective of the course. *(3 hours a week.)*

250. Principles of Accounting: An introduction to accounting concepts and techniques as tools for administration of the economic activity of the business enterprise; recording, reporting and interpreting the financial data of the business unit. *(3 lectures, 2 laboratory hours a week.)*

325c (380c). Computers and Systems Analysis: Computer programming; instruction in FORTRAN language; operation of the IBM 1620 computer; business decision-making; systems analysis; building deterministic models; building probabilistic models through use of a computer. *(3 hours a week, one semester; half course.)*

332c (352a). Advertising: A study of principles and methods of advertising, involving such areas as media, selection, programs, integration and demand factors. Primary emphasis is placed on advertising of consumer products from the point of view of the manufacturer, rather than that of the advertising agency or retailer. *(3 hours a week, one semester; half course.)*

333c (352b). Sales Management: The organization and management of the selling operation, including product development, branding, testing, sales organization and programs, training compensation, pricing. *(3 hours a week, one semester; half course.)*

334c. Consumer Market Behaviour: An analysis of consumer motivation, buying behaviour, market adjustment, and product innovation, including a survey of explanatory theories of consumer market behaviour and producer reactions. *(3 hours a week, one semester; half course.)*

340c (390c). Production Management: Problems and methods of analysis applicable to the manufacturing function in the modern enterprise, with special emphasis on operations research, production planning and control, methods study and work simplification. *(3 hours a week, one semester; half course.)*

346. Personnel Management and Industrial Relations: A study of organization for personnel administration, employee motivation, and union-management relationships. Methodology involves the application of principles to specific situations by use of the case method. *(3 hours a week.)*

350. Intermediate Accounting: The essential principles, postulates, rules and procedures of accepted accounting thought are emphasized as they apply to current practice. *(3 hours a week.)*

360. Management Accounting: Intended for the users of accounting information. Although procedures and techniques are not ignored, the emphasis is on the way in which accounting information can be used in the management process. *(3 hours a week.)*

373 (353). Business Finance: A comprehensive basic course; emphasis on analysis in order to demonstrate the application of principles. *(3 hours a week.)*

396 (356). Commercial Law: Legal approach to business problems. Nature and source of law, crimes, torts, contracts, agency partnerships, corporations, real and personal property, sales, negotiable instruments, insurance and bankruptcy. A combination of case and textbook approach. *(3 hours a week.)*

432c (452a). Retailing: A study of marketing, sales management, advertising and research methods as they apply specifically to the retail field. The approach is from a point of view of both the large and the small retailer. *(3 hours a week, one semester; half course.)*

433c (452b). Market Research: The use of analytical methods to improve the efficiency of marketing operations; development of a broad understanding of the uses and methods of research as applied to marketing. *(3 hours a week, one semester; half course.)*

435c. International Marketing: The managerial and operational problems of world trade with emphasis on the systems influencing multinational marketing strategy. *(3 hours a week, one semester; half course.)*

446c. Administrative Practices: An analysis of problems arising in the field of human relations throughout the various areas of business enterprise. *(3 hours a week, one semester; half course.)*

448c (458a). Labour Law and Industrial Legislation: An analysis of legislation dealing with labour organization; wages; working conditions; fair employment practices and financial security of the worker. *(3 hours a week, one semester; half course.)*

449c (458b). Collective Bargaining: The techniques and procedures involved in contract negotiations and contract administration, with special emphasis on grievance procedures and arbitration. Principles are illustrated by means of case studies. *(3 hours a week, one semester; half course.)*

450c (450a). Advanced Accounting: Intended to complement previous accounting courses, this course is directed primarily to students contemplating careers in this field. The emphasis is on specialized areas and on accounting literature and modern thought. *(3 hours a week, one semester; half course.)*

451c (450b). Taxation: Intended to provide the student with a knowledge and understanding of the Canadian taxation structure, this course examines the theoretical aspects and practical problems in the area of income tax and surveys other tax topics. *(3 hours a week, one semester; half course.)*

460c (460a). Auditing: Auditing procedure is studied with respect to the examination of business records and documents in order to determine their authenticity and the reliability of statements prepared from them. *(3 hours a week, one semester; half course.)*

463c (463a). Finance: Working Capital: A seminar in financial management relating to problems in working capital. (Prerequisite: Bus. Ad. 353). *(3 hours a week, one semester; half course.)*

464c. (463b). Finance: Long-term Financial Management: A seminar in long-term financial management. (Prerequisite: Bus. Ad. 373). *(3 hours a week, one semester; half course.)*

470c (470b). Cost Accounting - Analysis and Control: Development of accounting information as a basis for managing and evaluating the operations of individual segments of business enterprises. *(3 hours a week, one semester; half course.)*

473 (453). Investment Fundamentals and Portfolio Management: Appraising corporate securities from the viewpoint of the individual investor; shaping of portfolios to fulfill the needs of individuals and institutions. *(3 hours a week.)*

490 (480). Business Policy: Application of the principles and techniques acquired in the basic courses to comprehensive management problems. *(3 hours a week)*

491c (457b). Business Conditions: The nature and causes of business fluctuations and the forecasting and control of such fluctuations. *(3 hours a week, one semester; half course.)*

492 (459). Business Research: An introduction to research methods. The student will select a topic and, under direction, investigate and report upon it. *(Hours to be arranged; full course.)*

SEMESTER-HOUR EQUIVALENTS

The following list has been compiled for the convenience of evaluating committees in institutions which employ a semester-hour credit system.

I. Grade 13 subjects:

English, French, German, Greek, Italian, Latin, Spanish, Mathematics A 6

Biology, Chemistry, Physics 4

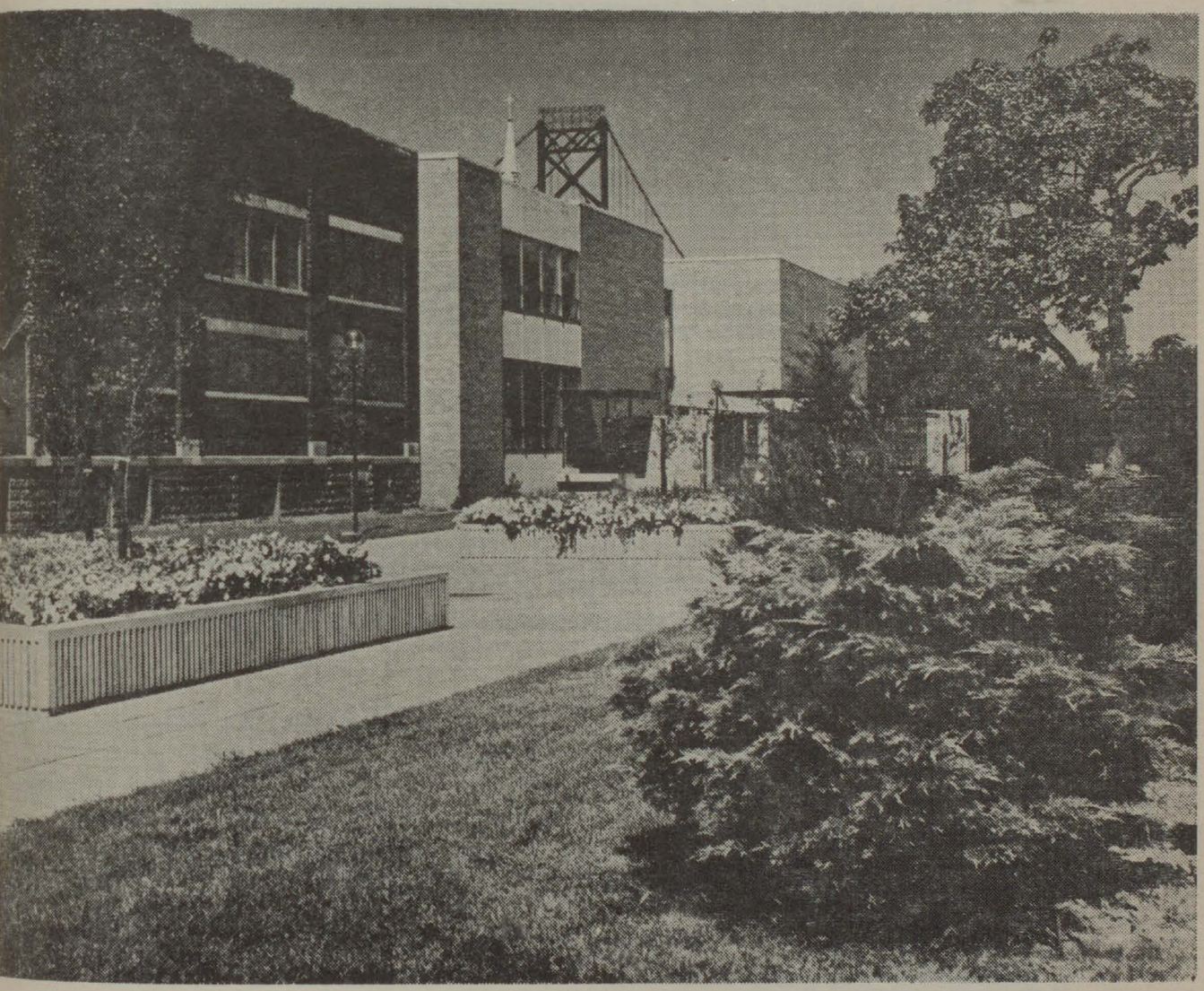
Algebra, Geography, Geometry, History, Mathematics of Investment, Mathematics B, Music, Trigonometry 3

II. University subjects:

Business Administration

	Semester Credits		Semester Credits		Semester Credits
15a	3	346	6	450c	3
15b	3	350	6	451c	3
24a	2	360	6	460c	3
225	6	373	6	463c	3
231	6	396	6	464c	3
250	8	432c	3	470c	3
325c	3	433c	3	473	6
332c	3	435c	3	490	6
333c	3	446c	3	491c	3
334c	3	448c	3	492	6
340c	3	449c	3		

UNDERGRADUATE AWARDS AND FINANCIAL AID



St. Denis Hall and University Centre

UNDERGRADUATE AWARDS AND FINANCIAL AID

1. AWARDS:

The term **"award"** is a general designation applied to any citation, medal, gift or grant of money presented to a student.

Scholarships are awards made in recognition of academic excellence and general proficiency. They may take the form of a monetary allowance or a proficiency medal or in some cases both.

Prizes are awards made in recognition of outstanding scholastic achievement or proficiency in a specific area.

Bursaries and **grants** are monetary awards made on the basis of satisfactory scholastic standing and financial need.

2. LOANS:

Students who have satisfactory scholastic standing and who demonstrate financial need have access to loan funds to assist them with emergency financing. Loans are repayable according to the terms of a definite agreement. (See pages F-16, 17).

3. CLASSIFICATION:

For the convenience of applicants, the awards and other forms of aid are organized into sections A, B, C, and D.

Section A includes awards which are available to students in all Faculties of the University.

Section B includes awards which are available in one Faculty or Department.

Section C lists, for the interest of applicants, several awards which, although not in the control of the University, are available to its students.

Section D lists loans and other forms of aid.

For further information on available awards the following sources are recommended:

1. Guidance Officers in Secondary Schools;
2. Awards Office of the University;
3. Dominion Bureau of Statistics publication "University Entrance Awards" copies of which are available in the Awards Office and the University Library.

4. DECISIONS ON AWARDS:

(a) Awards listed in Sections A and B will be made on the basis of the recommendation of the Awards Committee to the Senate of the University. No application for these awards is necessary.

The decisions on awards will be made as soon as the required information becomes available to the Committee.

(b) For awards and other aid listed in Sections C and D, students should obtain application forms from the Administering Agency indicated. The respective deadlines for applying are those required by the donors.

5. ANNOUNCEMENT OF AWARDS:

The assignment of awards shall be final when formally announced by the University. Entrance scholarships for United States students are usually announced in March, In-Course scholarships in May and the Entrance Scholarships for Canadian students as soon as the necessary information is available.

6. PAYMENT OF FUNDS:

Awards under the jurisdiction of the University will ordinarily be paid or applied to academic fees in two instalments, one in each semester, provided that the recipients are continuing in their courses to the satisfaction of the University. If the work of the first term is unsatisfactory, payment for the second term may be withheld.

7. MULTIPLE AWARDS:

(a) In the case of students having become eligible for scholarships and/or bursaries aggregating more than $900 in the case of local students and $1500 for others, the amount of the University Entrance Award will be reduced so that the aggregate of awards for a student does not exceed these respective amounts.

(b) A student may be declared the winner of as many scholarships as he may win as a qualified candidate of merit, but, in the case of awards involving a major financial amount, such students will normally receive only the largest among these major amounts.

(c) Winners of scholarships and prizes may resign the monetary value but retain the honour of such awards, and their names will be published as winners.

8. GENERAL:

(a) A student who has received an award within the jurisdiction of the University will be expected to complete his course at this University, unless there are extenuating circumstances.

(b) Awards listed in Sections A and B will be made by the Senate Committee on Student Awards to qualified candidates of merit, and may be withheld if no candidate of merit presents himself.

(c) The University does not guarantee any award other than those created from the funds of the University. Those awards which are the gifts of outside donors are awarded only after the funds have actually been received.

(d) The University reserves the right to substitute part or all of its award by an equivalent award.

LIST OF AWARDS

A. AWARDS AVAILABLE IN ALL UNDERGRADUATE FACULTIES

I. University of Windsor Entrance Awards

The following general conditions apply to the entrance awards listed below:

(i) Each applicant must have first class honours standing or the equivalent as determined by the Committee on Student Awards.

(ii) The Secondary School Principal's confidential rating of the student and the results of the Ontario Scholastic Achievement tests will form the basis for determining many of the awards. The results of the Ontario Grade XIII departmental examinations may be used as an additional basis of determination in some cases.

(iii) In any case where the results of the candidate's Ontario Grade XIII departmental examinations are being used as a determining factor, the candidate must have completed seven credits in one year, and must have the credits required for the course he wishes to pursue. When a candidate has obtained one or more credits while in Grade XII and seven or more credits while in Grade XIII, the average upon which the award is based will be calculated on the best seven credits, provided that the marks obtained in the compulsory credits are included in this calculation.

(iv) Each recipient must enroll in the University for the academic year immediately following the conferring of the award, or forfeit the award.

(v) Some scholarships may be renewed for a maximum of four years (or until graduation, whichever is sooner) provided that the student is registered in an Honours Course, carries a full academic load and maintains first class honours standing. In the event that a recipient fails to meet these requirements he will lose the scholarship for the ensuing year, but may regain it in a subsequent year if he again succeeds in meeting the requirements.

(1) **City of Windsor and County of Essex:**

(a) To the student standing highest in each high school located in the City of Windsor and in Essex County, provided he has achieved an average of 80 per cent or better, a scholarship of $600 a year.

(b) To residents of the City of Windsor and Essex County who attend Essex County High Schools and who achieve very high standing, several awards up to the amount of tuition fees, but not incidental fees. The actual amount is determined on the basis of scholastic standing.

(2) **Province of Ontario Outside Essex County:**

A number of scholarships are available for the students from the Province of Ontario outside of Essex County, and a special effort is made to distribute them throughout the counties and districts of the Province. The total possible value of each award is $2,400 ($600 for each of four years).

(3) **Canada Outside Ontario:**

A limited number of scholarships are offered to applicants from Canada outside Ontario. The total possible value of each award is $2,400 ($600 for each of four years). Candidates should apply on the basis of Senior Matriculation in their respective provinces. In areas where the equivalent of Ontario Grade XIII is not readily available. candidates may apply on the basis of Junior Matriculation.

(4) **African Student Scholarships:**

One scholarship is provided for an African student through the African Student Foundation. This award excuses tuition (but not incidental fees), and is renewable for four years, provided satisfactory scholastic standing is maintained.

(5) **University of Windsor Alumni Scholarships:**

Five or more scholarships valued at $500 each, renewable for three additional years if "A" average is maintained, awarded at entrance to students preferably from areas where Alumni Chapters exist. Applicants must have completed Grade XIII or Senior Matriculation in one year, with a minimum average of 75 per cent in the subjects required for admission.

II. Scholarship Medals

The Governor-General's Medal:

Awarded annually to a graduating student chosen by the Committee on Student Awards, on the basis of academic performance and contribution to university activities.

The Board of Governors Medals:

Awarded annually to students graduating with the highest standing in each of several courses, and to the undergraduates with the highest standing in each year, regardless of course.

III. Assumption University Awards

The following awards held in trust by Assumption University are available to all students of the University of Windsor who can meet the requirements. The recipients are selected by the Senate of the University of Windsor.

Dr. Roy J. Coyle Memorial Prizes:

Prizes of $50. each are awarded annually to the students with the highest standing in English 15.

Helena M. Coyle, B.A., Prize:

The interest on $1,000 is offered annually as a prize to the student with the highest standing in English 15.

McManus Memorial Classics Prize:

An annual award of $40. to the best student in Latin 12. Donated in memory of the late Patrick McManus of St. Thomas, Ontario, by his descendants, of whom 11 are Alumni of Assumption University.

J. C. McGuire Bursary: Value $450.

Dr. Roy Coyle Memorial Bursary: Value $300.

Fred H. Anderson Memorial Bursary: Value $250.

Edmund Girardot Memorial Bursary: Value $200. to a graduate of a Roman Catholic High School in Essex County.

D. S. McIntyre Bursary: Value $200. to a graduate of a Roman Catholic High School.

Frank McIntyre Memorial Bursary: Value $200. to a graduate of a Roman Catholic High School.

Msgr. F. X. Laurendeau Memorial Bursary: Value $150. to a graduate of a Roman Catholic High School in Windsor.

John B. Kennedy Memorial Entrance Awards:

Value $300. Two awards are made annually: one to a graduate of a Canadian, and one to a graduate of an American high school.

Renewable annually, provided satisfactory standing is maintained, to a total possible value of $1,200. Tenable with other entrance awards.

Established in 1963 through the benefaction of the late John B. Kennedy, to Assumption University.

Norah Cleary Entrance Awards:

Value: Tuition and all other fees except fees for room and board.

One or more awards made annually to students who have been attending for at least two years Windsor and Essex County High Schools (with preference to students of Patterson and Kennedy Collegiates). Applicants must have completed the entrance requirements for the degree course of their choice with satisfactory standing and must show need of financial assistance.

Renewable annually, provided satisfactory standing is maintained.

If a successful applicant receives other awards during the academic year which, with this award, total more than $900, the excess over $900 shall be deducted from this award.

Established in 1963 through the benefaction of the late Miss Norah Cleary to Assumption University.

Dr. Alfred E. Thomas, Sr., Memorial Award:

Value $300. Awarded annually on the basis of scholastic standing and financial need to a deserving student in any year of any degree course. Established in 1962 by Dr. Alfred E. Thomas, Jr., in memory of his father.

United States:

An applicant for one of the following scholarships must be a citizen and resident of the United States; must possess the entrance requirements necessary for the course he wishes to enter; must be in the top quintile of the class; must take the scholastic aptitude test offered by the College Entrance Examination Board on or before December 31 of the year prior to admission; must apply for admission and for the scholarship before March 1.

1. Assumption Alumni Scholarships. Value $3200 ($800 per year).
2. Friends of Assumption Foundation, Inc., Scholarships. Value $2000 ($500 per year).

IV. Canterbury College Awards

The following awards are all administered by Canterbury College. Application for them should be made to the Principal of the College.

(1) **Fred Musson Memorial Bursary:**

Value $100. To be awarded to an undergraduate or graduate student on the basis of ability and need.

(2) **Brotherhood of Anglican Churchmen Prize:**

Value $100. To be awarded to the student obtaining the highest mark in the Anglican section of First Year Theology.

(3) **Warwick Plumb Prize:**

Value $50. To be awarded to the student in Canterbury College obtaining the highest overall average, in any course or year.

(4) **Beatrice Plumb Prize:**

Value $50. To be awarded to the best all-round student in Canterbury College. The students shall nominate three; the winner to be chosen by the Principal of Canterbury College.

V. Additional Awards Administered by the University

Frank D. Brockenshire Memorial Prizes in Creative Writing:

Prizes to the amount of $100 are awarded annually for original contributions in prose and poetry. Donated by Mrs. F. A. Brockenshire.

University Women's Club of Windsor Scholarship:

Value $300. Awarded annually to an outstanding female student in an honours course, who has completed at least one year and is not enjoying a continuing scholarship.

The Hydro-Electric Power Commission of Ontario Bursary:

Value $500. Awarded to a second year student proceeding to an honours degree in any of the following areas: applied science and engineering, mathematics, physics, business administration, and/or commerce.

Windsor Independent Insurance Agents Association Bursaries:

Three awards, valued at $350 each, to deserving students who are residents of Essex County.

Steel Company of Canada Entrance Bursary:

Value $500 per year, renewable for a maximum of four years, or until graduation, whichever is sooner. Recipient must be a permanent resident of Canada, must have completed the final year's work for university entrance in one school year and must have attained a minimum average of 66 per cent. Not tenable with other scholarships totalling in excess of $200.

Ann Anderson Piggott Memorial Award:

Value $350. Awarded annually to a Canadian student, on the basis of academic standing and financial need.

Alex Pavlini Memorial Award:

Value $200. Awarded to a student in an arts course who has maintained a good scholastic record and who has participated actively in the radio and/or dramatic activities of the University.

A.T.A. Trucking Industry Educational Foundation Bursaries:

In-course bursaries for second and third year students who because of extenuating circumstances are deserving financial assistance.

Atkinson Charitable Foundation Bursaries:

These awards are made to deserving students who are enrolled in a course leading to a degree, and show evidence of academic sincerity, future promise and financial need. Applicants must be residents of the Province of Ontario.

I.B.M. Thomas J. Watson Memorial Bursaries:

Value $100 - $200. These bursaries are awarded annually to students who have completed at least one year of university studies with an average of 66 per cent, and who have financial need. The bursaries are made possible by an annual grant of $1,000 from International Business Machines Co. Ltd.

The H. Joseph McManus Scholarship:

Value $600. Awarded annually at the discretion of the Committee on Student Awards to a deserving student. Established in 1954.

Rotary Club of Windsor Bursaries:

Two bursaries of $200 each, awarded on the basis of a minimum average of 66 per cent and evidence of need to candidates enrolled in any faculty in the University of Windsor, provided that both bursaries are not awarded in the same faculty.

Rotary Club of Windsor Centennial Award:

Value: $200. A Centennial Award to a deserving student in any year beyond the First. Other factors being equal, the preference will be given to a student who has displayed an active interest in International Relations or in Youth Service work.

Domforge Windsor Credit Union Bursaries:

Two awards annually, each valued at $250, to students registered in second year. Whenever possible they are to be assigned to dependents of members of the Domforge Windsor Credit Union; when no such candidate is available they are open to all second year students.

Nathan Tepperman Bursary:

Value: $150. Awarded annually on the basis of scholastic ability or character or financial need or any combination of the foregoing according to the best judgment of the Committee on Student Awards to a deserving student in any year of any course. Established in 1956 by associates of Mr. Nathan Tepperman of Windsor, Ontario.

Gordon Gray Bursary:

Value: $100. Awarded to children of regular, full-time employees in the Windsor operations of John Wyeth and Brother (Canada) Limited, such employees to have at least two years of continuous service. Selection of the student will be according to the best judgment of the University Committee on Student Awards and the award may be on the basis of both scholarship and need to a student in any year of the University course. Established in 1962 by associates of Mr. Gordon Gray.

University of Windsor Women's Auxiliary Bursary:

Value: $100. Awarded annually on the basis of financial need and scholastic ability, preferably to a woman student.

Carson R. Elford Memorial Bursary:

Value,—the annual interest on the Carson R. Elford Memorial Fund (approximately $50.). Awarded to a student with satisfactory scholastic standing and financial need. Established in 1964 by the family, friends and Ford Motor Company associates of Carson R. Elford.

Sister Mary Electa Award:

Value: $250. Awarded to a woman student in residence on the basis of satisfactory standing and need. Sponsored by University of Windsor Alumni Association.

World University Service Seminar Award:

For the student who represents the University at the W.U.S. Summer Seminar, the University waives tuition fees for the academic year immediately following the seminar.

Windsor & District Labour Council Centennial Award:

Value: $200. One or more awards to be granted annually on the basis of scholarship, financial need and on interest displayed in social and economic problems and in extra curricular activities of a literary or organizational nature in secondary school or university. The student must be a son or daughter of a member of a Council affiliate who is a resident of Essex County and must be a Grade 13 graduate of an Essex County secondary school.

Application forms may be obtained from the Awards Office before July 31st.

B. AWARDS LIMITED TO FACULTY OR DEPARTMENT

ARTS AND SCIENCE

Rhea Bray Memorial Bursary:

Value: $150. Awarded annually, on the basis of academic merit and need, to a woman student (preferably a freshman) recommended by the Dean of Arts and Science and approved by the Committee on Student Awards. In rare cases may be assigned to the same recipient two years in succession.

Established in 1955 by the Zonta Club of Windsor.

The Society of Chemical Industry Merit Award:

A gold key and one year subscription to "Chemistry and Industry" awarded annually to the student standing highest in the final year of each of **Honours Chemistry,** and Chemical Engineering, provided he has a minimum average of 75 per cent, and has completed his program in the normal number of years.

Alcan Scholarship:

Value: $800 per year – $500 to the student and $300 to the University.
Awarded on the basis of financial need, character and ability, to a student registered in a course leading to a degree in the following branches of Engineering: Chemical, Industrial, Mechanical, Metallurgical, Engineering Physics, Engineering Science, or in honours science courses in **Chemistry, Mathematics, Metallurgy** or **Physics.**

The Chemical Institute of Canada (Essex-Kent Section) Award:

Value: $100. Awarded annually on the basis of high standing in Chemistry and of good standing in the other sciences and in mathematics, to a student entering the second year of any of the honours courses in **Chemistry,** or Chemical Engineering.

Essex County Medical Society Bursary:

Value: $750. This award is made to a resident of Essex County who has completed the pre-medical course at the University of Windsor and who has been accepted in Medicine at a Canadian University. Applicants must have a minimum average of 66 per cent in the final pre-medical year, and must have some financial need.
Established by the Essex County Medical Society in 1963.

Essex County Dental Association Bursary:

Value: $200. Awarded annually to a needy and proficient student in course, studying the biological sciences, preferably in pre-dentistry.

Raechel Slobasky Kaplan Award in Social Work Bursary:

Value: $180. Awarded annually to a student enrolled in the Department of Social Work.

Cominco Scholarships:

To assist in ensuring a continuing supply of qualified graduates in fields vital to industry in Canada, Cominco Ltd. has established a program of twenty-four scholarships at specified Universities in Canada. One of these scholarships will be awarded annually in the form of a two-year award of $800 per year, at the University of Windsor. It is open to students who, in the fall, will enter the penultimate undergraduate year of a course leading to a degree in **Honours Geology,** Geological Engineering, Mining, Mineral Engineering, Metallurgy, Metallurgical Engineering, Mechanical Engineering, **Honours Chemistry, Soil Science, Agronomy.** Students must apply to the University of Windsor by August 1st on forms obtainable from the Awards Officer, University of Windsor, Windsor, Ontario. Renewals for the second year will be subject to attainment of academic standards satisfactory to the Scholarship Committee of the University.

The Major H. P. Swan Prize in Philosophy:

A prize of $50. awarded annually to the student in III or IV Year of an Honours program in Philosophy with the highest Honours average, or in II or III Year of the General Program majoring in Philosophy with the highest average in the subjects of his major.
Endowed by the late Major H. P. Swan (1966).

INCO Entrance Scholarship:

Value: Tuition fees, a grant of $300 to the student and up to $500 as a cost of education supplement to the University. Maximum award for scholarship is $1,200. Restricted to students in engineering (preferably mining and metallurgy), **Mathematics, Chemistry, Physics, Geology** and **Geophysics.**

Any graduate of a high school, or any student who is in his final year of a high school, who has good scholastic standing and personal reputation, and who is recommended by his school authorities is eligible to apply.

Renewable annually for three consecutive years or until graduation, whichever is the shorter period. If the holder becomes ineligible, the scholarship can be awarded to another student in the same class or year.

Established in 1963 by the International Nickel Company of Canada, Limited.

BUSINESS ADMINISTRATION

H. A. Scarff Memorial Prize:

A prize of $50. awarded annually to the student with the highest standing in Business Administration 250. Established in 1957 by friends of the late Mr. H. A. Scarff, former member of the Senate.

Riddell, Stead, Graham & Hutchison Award:

Value: $500 to be applied against university fees in the fourth year. Awarded to a male Canadian student who has completed the third year of the Honours Bachelor of Commerce course with high standing who is proceeding to the fourth year, and who intends, upon graduation, to continue studying with a practising firm of Chartered Accountants. The award is made on the recommendation of the Dean of the Faculty of Business Administration.

Institute of Chartered Accountants of Ontario Scholarship:

Value: $300. Awarded on the basis of academic achievement to a student in course, who has attained a First Class Honours average and is entering his final year of study.

Milton M. Kovinsky Memorial Scholarship:

Value: $250. To an outstanding student in course, registered in **Business Administration** or Applied Science.

Price-Waterhouse & Co. Scholarship:

Value: $250. Awarded annually to a student who has completed the third year of the Business Administration course who has an outstanding academic record and ability, and whose interest is in public accounting as a career.

Clarkson, Gordon and Co. Scholarship:

Value: $200. Awarded annually to a student interested in a public accounting career who has completed the third year of the honours course in Business Administration, with a high standing in Business Administration 350 and a good overall average.

Personnel Association of Windsor and District Award:

Award of $100. to an outstanding Canadian student in the third year of the Honours Business Administration course, who shows a high aptitude for personnel and industrial relations work.

Ben Matthews Prize in Business Administration:

Value: $200. Awarded annually to the outstanding student in the graduating class in Honours Business Administration.

Cambridge Leaseholds Scholarship in Marketing:

Value: $250. Awarded annually to a student who has completed the third year of the Business Administration course and has an outstanding academic record and is interested in marketing as a career.

APPLIED SCIENCE

The Society of Chemical Industry Merit Award:

A gold key and one year subscription to "Chemistry and Industry" awarded annually to the student standing highest in the final year of each of Honours Chemistry and **Chemical Engineering,** provided he has a minimum average of 75 per cent, and has completed his program in the normal number of years.

The Association of Professional Engineers of Ontario Medal:

A gold medal awarded to the student standing first in the graduating class of the Faculty of Applied Science.

Association of Professional Engineers of the Province of Ontario Entrance Scholarship:

Award of $500 to a graduate of Ontario Grade 13 of outstanding ability who registers in the Faculty of Applied Science.

Engineering Institute of Canada Student Prize:

A prize of $50, awarded to a Student Member of the Institute in the year prior to the graduating year on the basis of the marks made in his academic year, and his activities in the student engineering organization or in the local branch of a recognized engineering society.

INCO Entrance Scholarship:

Value: Tuition fees, a grant of $300 to the student and up to $500 as a cost of education supplement to the University. Maximum award for scholarship is $1,200. Restricted to students in **Engineering** (preferably Mining and Metallurgy), Mathematics, Chemistry, Physics, Geology and Geophysics.

Any graduate of a high school, or any student who is in his final year of a high school, who has good scholastic standing and personal reputation, and who is recommended by his school authorities is eligible to apply.

Renewable annually for three consecutive years or until graduation, whichever is the shorter period. If the holder becomes ineligible, the scholarship can be awarded to another student in the same class or year.

Established in 1963 by the International Nickel Company of Canada, Limited.

Alcan Scholarship:

Value: $800 per year – $500 to the student and $300 to the University.
Awarded on the basis of financial need, character and ability, to a student registered in a course leading to a degree in the following branches of **Engineering: Chemical, Industrial, Mechanical, Metallurgical, Engineering Physics, Engineering Science,** or in honours science courses in Chemistry, Mathematics, Metallurgy or Physics.

Association of Professional Engineers of the Province of Ontario Scholarships:

Value: $250. One or more awards of $250 to outstanding students in the first, second and third years of accredited courses in Engineering.

Milton M. Kovinsky Memorial Scholarship:

Value: $250. To an outstanding student in course, registered in Business Administration or **Applied Science.**

The Chemical Institute of Canada (Essex-Kent Section) Award:

Value: $100. Awarded annually on the basis of high standing in Chemistry and of good standing in the other sciences and mathematics, to a student entering the second year of any of the honours courses in Chemistry, or **Chemical Engineering.**

The Reverend E. C. LeBel Award:

Value: $100. An annual award to a student who has completed the third year of any course in the Faculty of Applied Science with a good academic record and who has shown outstanding ability in English and the humanities. Established in 1963 by the Essex County Chapter of the Association of Professional Engineers of the Province of Ontario.

Student Engineering Society Award:

Value: $100. Awarded annually on the basis of academic standing, participation in Engineering Society activities, personal qualities and character of social and athletic activities, to a student entering fourth year Engineering.

The Odette Bursary in Engineering:

Value: $200. Awarded annually at the discretion of the Committee on Student Awards to a deserving student in Engineering.
Established in 1955 by Mr. L. L. Odette, Sr., of Tilbury, Ontario.

Cominco Scholarship:

To assist in ensuring a continuing supply of qualified graduates in fields vital to industry in Canada, Cominco Ltd. has established a program of twenty-four scholarships at specified Universities in Canada. One of these scholarships will be awarded annually in the form of a two-year award of $800 per year, at the University of Windsor. It is open to students who, in the fall, will enter the penultimate undergraduate year of a course leading to a degree in Honours Geology, **Geological Engineering,** Mining, **Mineral Engineering,** Metallurgy, **Metallurgical Engineering, Mechanical Engineering,** Honours Chemistry, Soil Science, Agronomy. Students must apply to the University of Windsor by August 1st on forms obtainable from the Awards Officer, University of Windsor, Windsor, Ontario. Renewals for the second year will be subject to attainment of academic standards satisfactory to the Scholarship Committee of the University.

DEPARTMENT OF HEALTH AND PHYSICAL EDUCATION

National Physical Fitness Undergraduate Bursaries:

Value: In amounts up to $500. Through the co-operation of the Federal Government and the Ontario Department of Education the University offers a number of awards on the basis of aptitude, academic proficiency and need. These are available to all students in each year majoring in the Physical and Health Education program at the University of Windsor. These bursaries are awarded on an annual basis provided funds are made available by the Government.

C. AWARDS DONATED AND ADMINISTERED BY DONORS

Province of Ontario Awards:

King George VI and Queen Elizabeth Scholarship:

The Province of Ontario will award this Scholarship to the student graduating from Grade 13 with the highest aggregate marks in the number of papers required for an Ontario Scholarship and who enrols in a degree course, other than Divinity, at an Ontario university in the month of September following the award. The Scholarship has a value of $500 a year, for a maximum of four years, provided at least second class honour standing is maintained. No application is required.

Ontario Scholarship Program:

The Province of Ontario awards an Ontario Scholarship to all students who achieve an average of 80 per cent or better in papers worth seven credits, as required for the Ontario Secondary School Honour Graduation Diploma, and written in June of the year of completion of Grade 13. These students will be designated "Ontario Scholars" and will receive an award of $400 or a lesser amount depending on the amount of other awards.

English or Francais are obligatory subjects and will count as two credits. No application is required.

Ontario Student Awards Program:

All students who are residents of Ontario and who satisfy the admission requirements of a Canadian university or an eligible post-secondary institution in Ontario may apply for an award under this Program. To receive an award a student must establish a need for assistance and enrol in an eligible institution in a course other than Divinity in the year of award. An award under this Program will be made to the extent of established need in a combination of a non-repayable grant and a Canada Student Loan. Application forms are available at secondary schools and all post-secondary eligible institutions.

Chrysler Canada Scholarships:

Value: $200. plus additional assistance based on need. Apply to Personnel Services Department, Chrysler Canada Limited, Windsor, Ontario.

Alma Mater Association of St. Mary's Academy Scholarship:

Award of $100. to the student of St. Mary's Academy who has obtained the highest standing in the Grade XIII examinations and is recommended by the Principal and staff.

Apply to – The Principal, St. Mary's Academy.

Ford Motor Co. Scholarships:

Academic fees plus living allowance. Apply to Ford Scholarship Administrator, Ford Motor Co. of Canada, P.O. Box 20, Oakville, Ontario.

Hiram Walker & Sons Scholarship:

Value: $850 a year. Apply to Public Relations Department, Hiram Walker & Sons Ltd., Walkerville.

Imperial Oil Higher Education Awards:

Academic fees. Apply to Secretary, Committee on Higher Education, Imperial Oil Limited, 111 St. Clair Ave. W., Toronto 7, Ont.

H. J. Heinz Company of Canada Ltd. Scholarship:

Value: $500 a year. Apply to the High School Principal.

Essex County Pharmacists' Association Bursary:

Value: $200. Apply to the Secretary of the Association.

Navy League of Canada Bursaries:

Value: $300. Apply to the Commanding Officers of Sea Cadet Corps.

Ellen Sullivan Memorial Bursary:

This is for graduates of Notre Dame High School, Chattanooga, Tennessee. The value of the bursary is the annual interest on Sullivan Bursary Fund (approx. $1,000) held in trust by Assumption University. Apply to The Principal, Notre Dame High School, Chattanooga, Tennessee.

University of Windsor Alumni Awards:

Five or more University of Windsor Alumni Awards, valued at $250. each, to be awarded on the basis of minimum average of 66 per cent and contribution to co-curricular activities in the areas of fine arts, student government, clubs and activities, publications and creative writing, and athletics.

G. Caboto Club Scholarships:

Aggregate value: $600. Two or more scholarships to Grade 13 students of Italian descent residents of the Windsor community, who are proceeding to a University.

Application forms may be obtained in the Windsor Secondary Schools.

Warren P. Bolton Memorial Award:

Value: $150. An award of $150 to a student in the second year of a course at the University who in the opinion of the Committee combines best the qualities of scholarship, leadership and participation in sports activities and at the same time has financial need.

Apply to Secretary-Treasurer, Windsor Utilities Commission.

V.O.N. Bursaries:

Value: $1,800. For nursing students only. Applications to be made to the Victorian Order of Nurses, 5 Blackburn Avenue, Ottawa, Ontario.

St. John Ambulance Association of Canada:

The Margaret MacLaren Memorial Fund. One or more bursaries of $1,000. to experienced registered nurses of proven ability and leadership potential who are preparing themselves for greater responsibilities and service. All factors being equal, special consideration will be given to those with St. John affiliation. Completed applications to be received prior to May 16 of any year by the Chairman, Bursary Funds, St. John Ambulance, 321 Chapel Street, Ottawa 2, Ontario.

St. John Ambulance Association of Canada:

The Countess Mountbatten Bursary Fund, – Bursaries of from $200. to $600. to student nurses in the basic and post-basic courses. Awards are made according to academic qualifications, personal suitability and financial need. All factors being equal, special consideration will be given to those with St. John affiliation. Completed applications to be received prior to May 16 of any year by the Chairman, Bursary Funds, St. John Ambulance, 321 Chapel Street, Ottawa 2, Ontario.

Ontario Department of Health Bursaries for Public Health Nursing:

Bursary assistance is available, through the Public Health Nursing Branch of the Ontario Department of Health, for study at diploma, certificate, or degree level for preparation in public health nursing.

This assistance consists of monthly stipends during the course of study as well as coverage of the University fees. Acceptance carries a service commitment to Public Health Nursing in Ontario.

For further information contact: Miss I. Black, Director, Public Health Nursing Branch, Parliament Buildings, East Block, Room 5502, Toronto 5, Ontario.

Windsor Utilities Commission Bursaries:

Two bursaries valued at $300. each. One bursary awarded to any student whose home is serviced by Windsor Utilities; the other awarded to a son or daughter of a Windsor Utilities employee. Written applications are to be forwarded to the Secretary-Treasurer of the Windsor Utilities Commission, 787 Ouellette Avenue, Windsor, Ontario by 30th June.

Windsor & Essex County Municipal Chapter I.O.D.E. Centennial Award:

Value: $200. Available to students of Windsor and Essex County enrolled in any year at the University of Windsor.

Other qualifications being equal preference will be given to students whose interests lie in the field of Commonwealth Relations, or Canadian History.

For further information apply to the Educational Secretary of the Windsor & Essex County Municipal Chapter I.O.D.E.

Windsor & Essex County Municipal Chapter I.O.D.E. Bursaries:

Two awards of $400 and $350 are given to students in post secondary education who are graduates of Windsor and Essex County Secondary Schools.

Apply to the Educational Secretary of the Windsor & Essex County Municipal Chapter I.O.D.E.

I.O.D.E. Chapter Bursaries:

A number of Primary I.O.D.E. Chapters offer bursaries to students who are graduates of local secondary schools.

For further information apply to the Educational Secretary of Windsor & Essex County Municipal Chapter I.O.D.E.

The Royal Canadian Legion and Ladies' Auxiliary Bursaries:

Available to persons eligible for membership in The Royal Canadian Legion or to children of deceased Veterans or to children of parents either of whom is eligible for membership in The Royal Canadian Legion.

The Donors are: (a) Dominion Command, (b) Ontario Provincial Command & Ladies' Auxiliary, (c) Legion Branches.

Enquiries regarding these bursaries may be directed to the local Zone Commander or to the principals of the secondary schools.

D. LOANS AND OTHER FORMS OF AID

Canada Student Loans Plan:

Full details of this Plan are available in a brochure issued by the Government of Canada which may be obtained at all eligible post-secondary institutions and secondary schools in Ontario. Students not eligible under the Ontario Student Awards Program may apply for a Canada Student Loan provided they are attending an institution in Canada or abroad which has been designated as eligible for Canada Student Loans only. The application form for the Ontario Student Awards Program is also used for the Canada Student Loans Plan.

Zonta Club of Windsor Loan Fund:

Interest free loans to female graduates of Windsor Secondary Schools.

Apply to: Secretary, Zonta Club of Windsor.

Rotary Club of Windsor Student Loan Fund:

Interest free loans to graduates of Windsor Secondary Schools. Preference given to students nearing graduation.

Apply to Youth Services Committee, Rotary Club of Windsor.

The Harry F. Bennett Education Fund of the Engineering Institute of Canada:

Loans are available from this Fund to enable deserving students who have completed at least one year in engineering to complete their studies. Maximum amount for one year: $250; maximum for all years: $450. The loan is without interest until graduation; thereafter interest at 4% per annum is charged on the unpaid portion.

For details apply to Dr. Cameron MacInnis, E.I.C. faculty representative on campus.

University of Windsor Loans:

Sincere students in serious need, who have academic promise (normally C standing or better) are eligible for loan assistance provided they have already applied for all other forms of assistance for which they are eligible. Minor loans range from $25 to $100 and must be repaid within one month. Major loans range from $101 to $500; they are usually meant to support a student for his second semester fees and should be applied for not later than December 15. For further information consult the Awards Officer.

The Children of War Dead (Education Assistance) Act:

Passed on July 1, 1953, this Act provides assistance towards an education beyond secondary school level for sons and daughters of veterans whose deaths were attributable to service in World War I, World War II, the Korean operations or peace-time service. If the application is approved, the Department of Veterans Affairs will pay

(a) to the student, an allowance of $34 per month for the period during which he or she is pursuing a full time course, up to a maximum of 36 months, or four academic years;

(b) to the university, fees and other costs of tuition as described in the Act, up to a maximum of $800 per academic year.

For further details consult the local office of the DVA.

Department of National Defence:

Students may apply for training in Canada's Armed Forces (Reserve): the University Naval Training Division, the Canadian Officers' Training Corps, and the RCAF University Squadron. Suitable candidates will be trained for commissioned rank.

Under the Regular Officer Training Plan, undergraduates who are successful applicants are enrolled as Officer Cadets in the Armed Forces of their choice. Tuition and other essential fees are paid by the Department of National Defence. Officer Cadets attending university receive an allowance of $125.00 each year to purchase books and instruments.

Scale of pay and allowances for ROTP is: $187.00 per month.

Free medical and dental care is provided. Annual leave (30 days plus travelling time) with pay and allowances may be granted each year, usually after the summer training period.

For further information, students are urged to apply to the Armed Force of their choice:

University Naval Training Division

Lt. Commander W. J. Waldron, RCN (R), B.Comm., Commanding Officer, H.M.C.S. Hunter

Lt. Commander T. C. Cross, RCN (R), B.Sc., Staff Officer (Training), H.M.C.S. Hunter

Canadian Officers' Training Corps

Major P. A. Deneau, B.A., Officer Commanding

Captain C. F. Allen, Resident Staff Officer, Dillon Hall, Suite 252

Captain G. A. Mascaro, B.A., Training Officer

Royal Canadian Air Force University Squadron

S/L W. G. Benedict, B.S.A., Ph.D., Faculty Air Force Representative, University of Windsor.

F/L Hessel, Resident Staff Officer, University of Western Ontario.

Canadian Forces Medical Undergraduate Subsidization Plan:

This scheme is designed to assist those who wish to make a medical career in one of the Armed Forces. Free academic tuition during the last three years of training in a medical school and other benefits are provided. Although previous training in the services is not an absolute necessity, the application by those who have had training in the UNTD, COTC or URTP will naturally be more favourably received than those who have not had any military experience. Further information may be obtained from Armed Forces representatives on campus.

U.S. Veterans' Affairs Aid Program:

Under an agreement between the University and the Veterans' Administration, financial aid is available to servicemen or veterans of the United States Armed Forces. Enquiries should be addressed to the local representative of the Veterans Administration nearest to the student's place of residence.

Student Aid Foundation of Michigan:

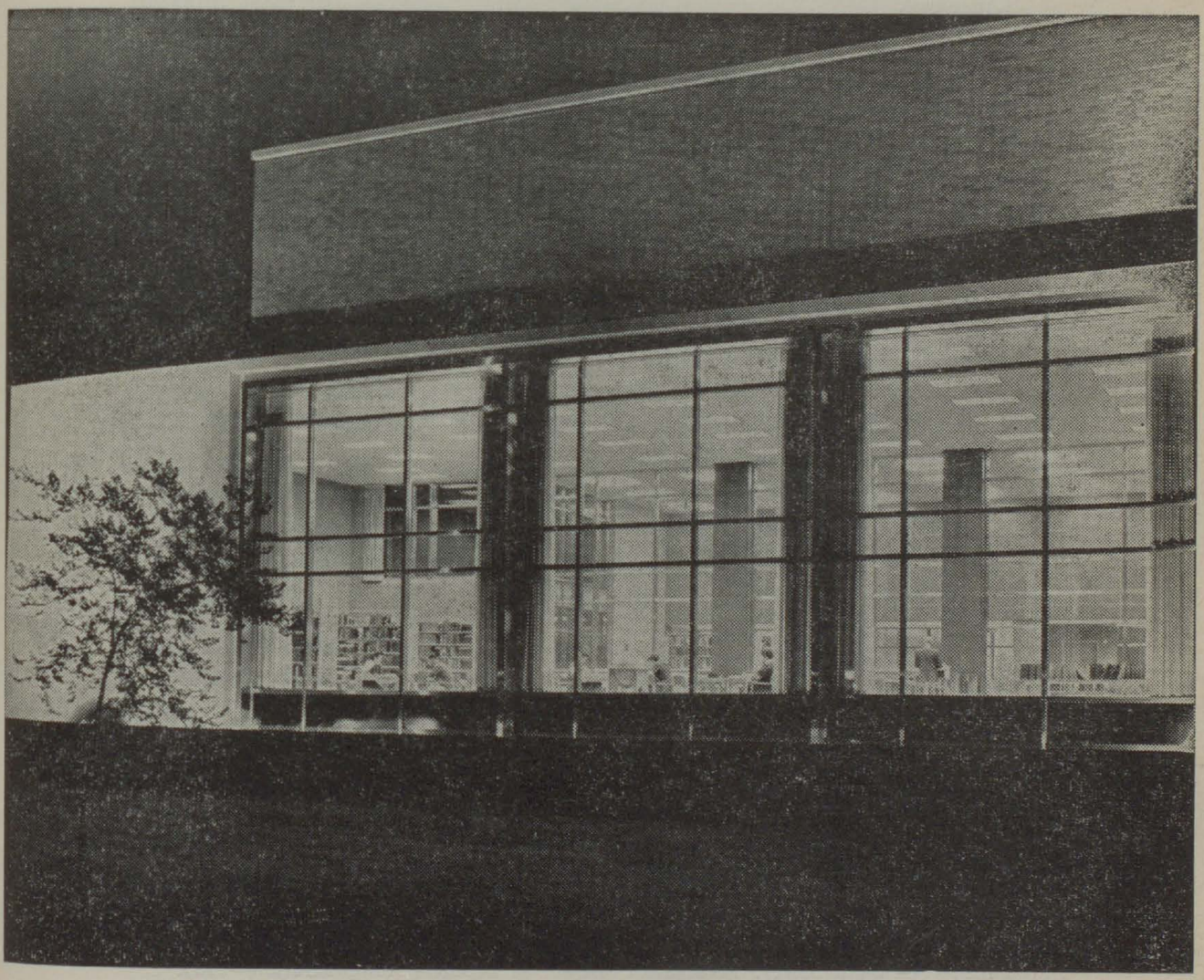
Students living in metropolitan Detroit, Windsor and Essex County may receive grants and loans for use at this University on the basis of academic record, character and financial need. Applicants should contact the Student Aid Foundation of Michigan, 2486 National Bank Building, Detroit 26, prior to December 14.

New York Higher Education Assistance Corporation:

Students, resident of New York State, attending this University may apply for financial assistance through the N.Y.H.E.A.C. Loan applications may be requested through New York lending institutions, or by writing to N.Y.H.E.A.C., 159 Delaware Avenue, Delmar, New York 12054.

PART THREE

THE FACULTY OF GRADUATE STUDIES



University Library

THE FACULTY OF GRADUATE STUDIES

The Senate Committee on Graduate Studies

The President, the Vice-President, the Dean of Graduate Studies (Chairman), the Associate Deans of the Faculty (if any), the Registrar (Secretary), two representatives from the Faculty of Graduate Studies elected to the Senate, and representatives from each department of the University which offers graduate work, as follows:

R. G. Billinghurst, M.A.Sc., Professor and Head, Department of Engineering Materials.

W. G. Colborne, M.Sc., Professor and Head, Department of Mechanical Engineering.

S. B. Cunningham, Ph.D., Associate Professor and Acting Head, Department of Philosophy.

Rev. C. J. Drouillard, C.S.B., Ph.D., Professor and Head, Department of Modern Languages.

Rev. D. T. Faught, C.S.B., M.A., Professor and Head, Department of Mathematics.

Rev. R. C. Fehr, C.S.B., Ph.D., Professor and Head, Department of Psychology.

A. W. Gnyp, Ph.D., Associate Professor of Chemical Engineering.

*R. A. Helling, Ph.D., Professor and Head, Department of Sociology and Anthropology.

J. B. Kennedy, Ph.D., Professor and Head, Department of Civil Engineering.

*A. E. Kovacs, Ph.D., Associate Professor, Department of Economics.

L. Krause, Ph.D., Professor and Head, Department of Physics.

Rev. E. R. Malley, C.S.B., M.A., Associate Professor and Head, Department of Theology.

*Rev. D. J. Mulvihill, C.S.B., Ph.D., Professor and Head, Department of History.

M. L. Petras, Ph.D., Associate Professor of Biology.

J. C. Ransome, Ph.D., Professor and Head, Department of Geography.

R. J. Smith, Ph.D., Associate Professor and Acting Head, Department of English.

R. J. Thibert, Ph.D., Professor of Chemistry.

P. A. V. Thomas, Ph.D., Professor and Head, Department of Electrical Engineering.

M. N. Vuckovic, Ph.D., Associate Professor and Acting Head, Department of History.

W. L. White, Ph.D., Associate Professor and Head, Department of Political Science.

M. Zin, Ph.D., Professor of Business Administration.

Members of the Faculty

(The year of first appointment is given).

Adelman, Maurice; B.Sc., M.A.Sc., Ph.D. (Toronto). Associate Dean of Graduate Studies; Professor and Head, Department of Chemical Engineering—1956.

Atkinson, Harold R.; B.Sc. (Western Ontario), M.Sc. (Assumption), Ph.D. (Queen's). Assistant Professor of Mathematics—1964.

*Babiy, George Borys; B.Sc., M.Sc.M.E. (Manitoba). Assistant Professor of Mechanical Engineering—1959.

Basic, E. Martin; B.S.E.E., B.S.M.E. (Illinois Institute), M.B.A. (Western Michigan, Ph.D. (Michigan State). Associate Professor of Business Administration—1965.

Benedict, Winfred Gerald; B.S.A., Ph.D. (Toronto). Professor of Biology—1957.

Billinghurst, Robert Gordon; B.A.Sc., M.A.Sc. (Toronto). Professor and Head, Department of Engineering Materials—1957.

*On leave of absence.

Birch, Cecil Mackintosh; B.A. (Western Ontario), M.A., Ph.D. (Toronto). Professor of Business Administration—1959.

Boland, Rev. Frank John, C.S.B.; B.A. (Toronto), M.A. (Detroit), Ph.D. (Ottawa). Professor of History—1955.

Bounsall, Edwin J.; B.A.Sc., Chem. Eng. (Toronto), M.A. (Toronto), D.I.C., Ph.D. (Imperial College, London), Assistant Professor of Chemistry—1965.

Briggs, Elsworth Donald; B.A. (New Brunswick), Ph.D. (London). Assistant Professor of Political Science—1963.

Brownlie, John Maxwell; B.A. (Western Ontario), M.B.A. (Michigan). Associate Professor of Business Administration—1958.

Bunt, Miriam Elizabeth; B.A. (Queen's), B.S., M.Ed., Ph.D. (Wayne State). Associate Professor in Psychology—1963.

Callaghan, Rev. John Francis, C.S.B.; B.A., M.A. (Toronto). Assistant Professor of Economics—1957.

Cervin, Vladimir Bohdan; B.A., B.Sc. (Vienna, Austria), D.S.S. (Brussels), Ph.D. (Prague). Professor of Psychology—1961.

Chrypinski, Vincent Casmere; M.L. (Catholic U. of Lublin, Poland), M.A. (Wayne), Ph.D. (Michigan). Professor of Political Science—1957.

Colborne, William George; B.Sc., M.Sc. (Queen's). Professor and Head, Department of Mechanical Engineering.

Crowley, Rev. Cornelius Patrick Joseph, C.S.B.; B.A. (Toronto), M.A., Ph.D. (Michigan); Dean of Graduate Studies, 1959. Professor of English—1944.

Cunningham, Stanley B.; B.A. (Manitoba), M.A. (Toronto), M.S.L. (Pont. Inst. Med. Stud.), Ph.D. (Toronto). Associate Professor and Acting Head, Department of Philosophy—1961.

Deck, John Norbert; B.A., M.A. (Western Ontario), Ph.D. (Toronto). Professor of Philosophy—1957.

DeMarco, Frank A.; B.A.Sc., M.A.Sc., Ph.D. (Toronto); Vice-President. Professor of Chemistry—1946.

Dougherty, Rev. John Roger, C.S.B.; B.A. (Western Ontario), S.T.B. (St. Michael's, Toronto), M.S. (Cornell). Assistant Professor of Biology—1951.

Doyle, Robert Joseph; B.A., M.A. (Western Ontario), M.S. (Michigan State), Ph.D. (Wayne State). Professor and Head, Department of Biology—1948.

Drouillard, Rev. Clarence Joseph, C.S.B.; B.A., M.A. (Toronto), Ph.D. (Laval). Professor and Head, Department of Modern Languages—1956.

Eliopoulos, Hermes Andrew; B.Sc. (Salonika, Greece), M.Sc. (McGill), Ph.D. (Toronto). Professor of Mathematics—1956.

*On leave of absence.

Fallenbuchl, Zbigniew Marian; B.Sc.(Econ.) (London), M.A. (Montreal), Ph.D. (McGill). Professor of Economics—1957.

Farrell, John Kevin Anthony; B.A., M.A. (Western Ontario), Ph.D. (Ottawa), F.R.S.A. Associate Professor of History—1962.

Faught, Rev. Donald Thomas, C.S.B.; B.A. (Toronto), M.A. (Michigan). Professor and Head, Department of Mathematics—1954.

Fehr, Rev. Robert Charles, C.S.B.; B.A. (Toronto), M.A. (Detroit), Ph.D. (Fordham). Professor and Head, Department of Psychology—1951.

*Fletcher, Harold Ross; B.A.Sc., M.A.Sc. (Toronto). Associate Professor, Department of Electrical Engineering—1958.

Flood, Patrick Francis; B.A., M.A. (Western Ontario). Associate Professor of Philosophy —1945.

Gertz, John Blake; B.Sc. (Detroit), M.B.A. (Ohio State). Associate Professor of Business Administration—1957.

Gillen, William John; B.A., M.A. (Toronto). Assistant Professor of Economics—1959.

Gnyp, Alex William; B.A.Sc., M.A.Sc., Ph.D. (Toronto). Associate Professor of Chemical Engineering—1958.

Habib, Edwin Emile; B.Sc. (Birmingham), Ph.D. (McMaster). Associate Professor of Physics—1958.

Habowsky, Joseph E. J.; Diplom-Landwirt (Technische Hochschule, Munich), M.S.A., Ph.D. (Toronto). Assistant Professor of Biology—1964.

Hartt, James Paul; B.A.Sc. (Toronto), D.L.S., O.L.S., M.S.C.E. (Wayne State). Associate Professor of Civil Engineering—1958.

*Helling, Rudolf A.; B.A., Ph.D. (Wayne). Associate Professor and Head of Department of Sociology and Anthropology—1956.

Holland, William John; B.Sc. (Queen's), M.S., Ph.D. (Wayne State). Associate Professor of Chemistry—1960.

Holuj, Frank; B.Sc. (London, England), M.Sc., Ph.D. (McMaster). Assistant Professor of Physics—1961.

Horne, Gilbert Richard; C.D., B.A. (Western Ontario), M.A., Ph.D. (Michigan). Professor and Dean, Faculty of Business Administration—1931.

Howell, Rev. Arthur Robert, C.S.B.; B.Sc. (Saskatchewan), S.T.B. (St. Michael's, Toronto), M.A.Sc. (Toronto). Assistant Professor of Mechanical Engineering—1958.

Huang, Roderick; B.A. (Fukien Christian University, China), M.A. (Wesleyan), M.A., Ph.D. (Northwestern). Professor of English—1966.

Huschilt, John; B.A., M.A. (Toronto), Ph.D. (Wayne State). Associate Professor of Physics—1953.

Isajiw, Wsevolod W.; B.A. (LaSalle), M.A., Ph.D. (Catholic University). Assistant Professor of Sociology and Anthropology—1965.

*On leave of absence.

Kennedy, John B.; B.Sc.(Hons.) (Cardiff, Wales), Ph.D. (Toronto). Professor and Head, Department of Civil Engineering—1963.

Kingston, Rev. Frederick Temple; B.A., M.A., L.Th., B.D. (Toronto), D.Phil. (Christ Church, Oxford); Principal, Canterbury College. Professor of Philosophy—1959.

*Kosicki, Rev. George Watka, C.S.B.; B.A. (Western Ontario), M.S., Ph.D. (Michigan). Associate Professor of Chemistry—1956.

*Kovacs, Aranka Eve; B.A. (McMaster), M.A. (Toronto), Ph.D. (Bryn Mawr). Associate Professor of Economics—1961.

Krause, Lucjan; B.Sc. (London, England), M.A., Ph.D. (Toronto), F.Inst.P. Professor and Head, Department of Physics—1958.

LeMire, Eugene D.; Ph.B., M.A. (Detroit), Ph.D. (Wayne State). Associate Professor of English—1962.

McCarthy, Lillian Margaret; B.A., M.A., Ph.D. (Toronto). Professor of Modern Languages—1958.

McCurdy, Howard Douglas; B.A., B.Sc. (Western Ontario), M.Sc., Ph.D. (Michigan State). Associate Professor of Biology—1959.

MacInnis, Cameron; B.Sc. (Dalhousie), B.E.(Hons.) (Nova Scotia Technical College), Ph.D. (Durham, U.K.). Associate Professor of Civil Engineering—1963.

McKenney, Donald J.; B.Sc., M.Sc. (Western Ontario), Ph.D. (Ottawa). Assistant Professor—1964.

McNamara, Eugene Joseph; B.A., M.A. (DePaul), Ph.D. (Northwestern). Associate Professor of English—1959.

Maasland, Dirk Elbert Leo; M.Sc., Ph.D. (Colorado State). Assistant Professor of Civil Engineering—1964.

*Malone, Rev. John Alphonse, C.S.B.; B.A. (Western Ontario), M.A. (Toronto), Ph.D. (Fordham). Associate Professor of Psychology—1959.

Mathur, Gurucharan Prasad; B.S. (Bombay), M.S., Ph.D. (Northwestern). Assistant Professor of Chemical Engineering—1964.

*Mulvihill, Rev. Daniel Joseph, C.S.B.; B.A. (Western Ontario), M.A., Ph.D. (Michigan); President, Assumption University. Professor and Head, Department of History—1942.

Nelson, Ralph Carl; B.A., M.A. (DePaul), Ph.D. (Notre Dame). Associate Professor of Political Science—1961.

Nicol, Allan; Applied Physics (Royal College of Science and Technology, Glasgow), Ph.D. (Edinburgh). Associate Professor of Mechanical Engineering—1963.

North, Walter P. T.; B.Sc. (Queen's), M.Sc. (Saskatchewan), Ph.D. (University of Illinois). Associate Professor of Mechanical Engineering—1965.

Ogata, Hisasha; B.Sc. (Tokyo), Ph.D. (Western Reserve). Assistant Professor in Physics —1965.

O'Meara, Rev. John Patrick, C.S.B.; B.A. (Toronto), M.A. (Wayne State), Ph.D. (Ottawa). Professor of History—1959.

*On leave of absence.

Parr, James G.; B.Sc. (Leeds), Ph.D. (Liverpool). Professor of Engineering Materials and Dean of the Faculty of Applied Science—1964.

Petras, Michael Luke; B.Sc., M.Sc. (Notre Dame), Ph.D. (Michigan). Associate Professor of Biology—1956.

Philip, Brother Roger, F.S.C. (William James Overend); B.A., M.A. (Toronto), Ph.D. (Catholic U. of America). Professor Emeritus of Psychology—1956.

Phillips, William Gregory; B.A., M.A., Ph.D. (Toronto). Professor and Head, Department of Economics—1950.

Pillay, Datharthry T. N.; B.Sc. (Osmania University, Hyderabad, India), M.S., Ph.D. (Cornell). Assistant Professor of Biology—1963.

Price, Stanley James Whitworth; B.A., M.Sc. (British Columbia), Ph.D. (Edinburgh). Associate Professor of Chemistry—1959.

Pryke, Kenneth G.; B.A. (Carleton), M.A., Ph.D. (Duke). Associate Professor of History —1963.

Record, Rev. Maurice Adrian, C.S.B.; B.A. (Western Ontario), M.A. (Toronto). Associate Professor of Psychology—1952.

Robinson, David; B.Sc., M.Sc. (Queen's, Belfast), Ph.D. (Western Ontario). Associate Professor of Physics—1964.

Rothberger, Fritz; Ph.D. (University of Vienna). Professor of Mathematics—1966.

Rumfeldt, Robert Clark, B.Sc.(Hons.) (Loyola, Montreal), Ph.D. (Alberta). Assistant Professor of Chemistry—1965.

Rutherford, Kenneth Gerald; B.A. (Western Ontario), Ph.D. (Wayne State). Professor and Head, Department of Chemistry—1958.

St. Pierre, Carl Clifford; B.A.Sc. (Assumption), M.A.Sc., Ph.D. (Northwestern). Assistant Professor of Chemical Engineering—1964.

Sabina, Leslie Robert; A.B. (Cornell University), M.S., Ph.D. (University of Nebraska). Associate Professor of Biology—1965.

Singh, Sankatha P.; B.Sc. (K. N. Govt. College, Gyanpur), M.Sc., Ph.D. (Banaras Hindu University). Assistant Professor of Mathematics—1965.

Smith, Alexander Cormac; B.Sc., M.Sc., Ph.D. (Dublin). Associate Professor of Mathematics—1963.

Smith, Alfred Arthur; B.A., M.A. (Queen's), Ph.D. (McGill). Professor of Psychology—1959.

Smith, Raymond J.; B.A., M.A., Ph.D. (Wisconsin). Associate Professor and Acting Head, Department of English—1964.

Sridhar, Krishnaswamy; B.Sc. (Madras, India), M.A.Sc., Ph.D. (Toronto). Associate Professor of Mechanical Engineering—1963.

Stager, Robert A.; B.Sc., M.A.Sc. (Toronto), Ph.D. (Illinois). Associate Professor of Chemical Engineering—1963.

*On leave of absence.

*Sullivan, John Francis; B.S., M.A. (Detroit), Ph.D. (Michigan). Professor of English—1958.

Szamosi, Geza; Ph.D. (Budapest), D.Sc. (Hungarian Academy of Sciences). Professor, Department of Physics—1964.

Thibert, Roger Joseph; B.A. (Western Ontario), M.S. (Detroit), Ph.D. (Wayne State). Professor of Chemistry—1953.

Thomas, Paul Alexander Vivian; B.Sc.Eng. (London), Ph.D. (Glasgow). Professor and Head of Electrical Engineering—1962.

Tracy, Derrick S.; B.Sc. (Lucknow), M.Sc., Sc.D. (University of Michigan). Associate Professor of Mathematics—1965.

Tucker, Henry Joseph; B.Eng., M.Eng. (McGill). Associate Professor of Mechanical Engineering—1960.

van Wijngaarden, Arie; B.Sc., Ph.D. (McMaster). Associate Professor of Physics—1961.

Vuckovic, Milorad Nicholas; B.A., M.A. (Assumption), Ph.D. (McGill). Associate Professor of History—1960.

Walker, Franklin A.; B.A., M.A. (Toronto), Ph.D. (Cornell). Professor of History—1966.

Warner, Alden H.; B.A. (University of Main), M.A., Ph.D. (Southern Illinois University). Assistant Professor of Biology—1965.

White, Walter LeRoy, D.F.C.; B.A. (Western Ontario), M.A. (Toronto), Ph.D. (Michigan). Associate Professor and Head, Department of Political Science—1956.

Wood, Gordon Walter; B.Sc., M.Sc. (Mount Allison), Ph.D. (Syracuse). Assistant Professor of Chemistry—1963.

Youdelis, William V.; B.Sc. (Alberta), Ph.D. (McGill). Associate Professor of Engineering Materials—1965.

Zakon, Elias; Mgr. Phil., Dr. jur. (Stefan Batory U., Wilno). Associate Professor of Mathematics—1957.

Zin, Michael; B.Comm. (Assumption), M.B.A. (Michigan), Ph.D. (Michigan State). Professor of Business Administration—1956.

Zischka, Kurt Anton; M.A. (Johann Wolfgang Goethe University, Frankfurt), D.Sc. (Technische Hochschule Darmstadt, Germany). Associate Professor of Mathematics—1966.

*On leave of absence.

ACADEMIC INFORMATION AND REGULATIONS

1. **Application for Admission:** Application for admission should be addressed as follows:

Office of Graduate Studies
The University of Windsor
Windsor, Ontario, Canada.

The Office of Graduate Studies will send appropriate forms and instructions. Completed forms and other documents required for admission are to be sent to the Office of Graduate Studies.

Applications for admission (full-time and part-time day) should be submitted as early as possible; those reaching the Office of Graduate Studies after July 1 may not be approved in time to permit registration in classes. If a fellowship is sought, application for admission, together with supporting documents, should reach the Office of Graduate Studies before March 15; otherwise no assurance can be given that the application for a fellowship will be considered.

Applications for admission to Graduate Studies by Extension should be submitted by September 1st otherwise no assurance can be given that an application received after that date will be given consideration. All applications must be complete by the last date of registration.

An application fee of $10.00 (Canadian Funds) must accompany **all** applications for admission to Graduate Studies at the University of Windsor. This fee is **non-refundable,** but applicable towards the student's tuition upon registration.

All applications for admission are considered by the Graduate Committee on Admissions. No application can come before this Committee unless it is supported by the following documents:

1. Two copies of the form, "Application for Admission to the Faculty of Graduate Studies," properly filled out. Overseas students need fill out only the one admission form which is found at the back of the "Information Booklet for Prospective Graduate Students from Overseas."

2. Official transcripts of all undergraduate and graduate work from all colleges or universities attended.

3. Two letters of recommendation, as indicated on the application form.

4. If required, certification of proficiency in English from the English Language Institute of the University of Michigan (see next page).

5. Graduate Record Examination scores (if required).

All applicants from abroad whose mother tongue is not English are required to take the English proficiency test administered by the English Language Institute of the University of Michigan, Testing and Certification, North University Bldg., Ann Arbor, Michigan, U.S.A. No substitute for this test will be allowed. The applicant is expected to make his own arrangements for taking the test in his own locale by contacting the center in his own locale or by writing to the Institute.

Note: For information concerning the upgrading of teaching certificates to the Type A level through special honours programs see the Undergraduate Calendar.

2. **Registration:** Students whose applications for admission to graduate study have been approved for full or part-time day should present themselves for registration on the date recorded in the calendar. Students whose applications have been approved for admission to graduate study by Extension, should present themselves for registration on one of the dates recorded in the calendar. Registration will not be completed until a "Plan-of-Work" form for the current year has been approved by the Head of the Department concerned or by a designated departmental advisor. This "Plan-of-Work" form serves as a "Permit-to-Register" for **all** graduate students. It may be secured from the Department Heads or Advisors prior to the dates of registration.

All students must register in every session in which the facilities of the University for graduate study are to be utilized, whether in residence or *in absentia.* This includes those who are consulting with members of the faculty while working on theses, research, or dissertations.

Once a student has registered, he may not change his course or withdraw without permission from the Dean of Graduate Studies. No change can become effective without official notification from the Office of Graduate Studies, and subjects dropped without permission of the Dean of Graduate Studies will be regarded as failures. Students who for any reason wish to withdraw are particularly urged to notify the Office of Graduate Studies, as otherwise resumption of graduate study at this or another university may be difficult or impossible.

Provisional Registration: A provisional registrant is one who is allowed to attend classes while his application is still under consideration. A student whose application is not complete by the regular registration period may be allowed to register provisionally. All required forms and documents must be submitted **before the last day of registration.** If the file is not complete by that date, or if the student is not eligible for admission as a credit student, he will be allowed to continue on a non-credit basis only as an audit student.

Audit Student: An audit student in any course is one who attends the course without credit towards a degree or program, and who is not entered or registered on the official University records or lists for purposes of academic or degree credit or transcript. Such a student will not be allowed to write examinations and cannot be graded in any way. He will normally pay the regular fees for the course(s) or program.

3. **Graduate Work by Extension:** Graduate programs leading to the Master of Applied Science and the Master of Business Administration are offered by Extension. In other programs, it may be possible to fulfill some or all of the requirements for a graduate degree through courses taken in the Extension Division; students should consult the Department Head or departmental advisor about the availability of complete graduate programs by Extension. All students working toward a graduate degree by Extension must be properly admitted to graduate study.

4. **Examinations:** A department may require either oral or written examinations in graduate courses. Students who miss an examination because of illness or other grave reason should notify the Office of Graduate Studies and submit supporting documents, if required, before or during the examination period. In such cases, the Dean of Graduate Studies may grant standing in the subject or subjects concerned on the basis of term marks alone.

The Departments listed below will require Graduate Record Examinations of all (old and new) students pursuing Graduate Studies. These examinations will be held about the first week in October, 1967.

The Department of Biology
The Department of Economics
The Department of English
The Department of History
The Department of Modern Languages
The Department of Philosophy
The Department of Psychology
The Department of Mathematics
The Department of Chemical Engineering
The Department of Electrical Engineering
The Department of Mechanical Engineering

M.B.A. applicants are required to take the Admission Test for Graduate Study in Business.

5. **Graduation:** In order to allow the necessary time for the printing of the diploma and the Convocation program, the candidate's completed work must be approved by the Faculty of Graduate Studies and his thesis or dissertation, if one is presented, must be received by the Library at least two weeks before Convocation.

Registration in any program does not constitute an application for a degree or diploma. An official application to graduate must be filled out and filed in the Registrar's Office at least 30 days prior to the Convocation at which the applicant hopes to graduate.

Each prospective graduate must be present in person at Convocation in order to receive his degree, unless excused for a serious reason by the Dean of Graduate Studies, and unless arrangements have been made to receive the degree *in absentia.*

THE DEGREE OF DOCTOR OF PHILOSOPHY

1. **Admission Requirements:** Graduates of the University of Windsor or of other recognized colleges or universities may apply for admission. In general, admission to graduate study is granted only to those students who have good academic records and who are adequately prepared to undertake graduate work in their field of specialization. In particular, an applicant for admission to a graduate program leading to the degree of Doctor of Philosophy must have either a Master's degree or an Honours Baccalaureate or the equivalent; his academic standing should be unquestionably superior.

An applicant for admission to a course of graduate studies leading to the Doctorate in Applied Science must be a graduate of a recognized College or University with at least a Bachelor's Degree in Applied Science, Engineering or Pure Science. An applicant's Bachelor's Degree need not be in his chosen field of graduate studies but should be in a related field.

Possession of the minimum requirements does not automatically ensure acceptance.

Applications will be received from students in their final undergraduate year, but acceptance will be conditional until the completed undergraduate record is submitted.

2. **Candidacy:** Admission to graduate study does not imply admission to Candidacy for a degree. Admission to Candidacy for the degree of Doctor of Philosophy is granted by the Dean of Graduate Studies, upon recommendation of the Department concerned, when a student has satisfied the requirements for Candidacy of the Faculty of Graduate Studies and of the Department, as these may be specified in Departmental listings in the Calendar. Admission to Candidacy is normally to be regarded as recognition that a student has given adequate evidence of superior capability and achievement in graduate study. A student may not be admitted to Candidacy for the degree of Doctor of Philosophy before passing a comprehensive examination in his field of specialization.

3. **Residence:** Residence requirements are intended to provide for each student an adequate contact with the University, with the faculty in his field of specialization, and with the library, laboratories, and other facilities for graduate study and research. It is expected, therefore, that every student in a program leading to the degree of Doctor of Philosophy will undertake a full program of study for a minimum of one academic year or its equivalent. Application and interpretation of the residence requirement is the responsibility of the Dean of Graduate Studies, and if a student does not expect to fulfill it in the normal way, he should submit to the Dean, in writing, his reasons for departing from the norm and secure approval for his plan, before beginning his graduate program. See also the section on "Duration of Study" below.

4. **Duration of Study:** The normal minimum duration of study for the degree of Doctor of Philosophy is three full years beyond the Honours Baccalaureate or its equivalent, or two full years beyond the Master's or its equivalent. Credit for graduate study previously undertaken may be given, but the duration of study at this University may not be reduced beyond the minimum of two years, for the degree of Doctor of Philosophy.

5. **Time Limit:** Work on the degree of Doctor of Philosophy should be completed within seven consecutive years of the student's first enrollment. If an extension of this time limit becomes necessary, the student should address a petition to the Dean of Graduate Studies, giving his reasons for the request and plans for the completion of his work. A student who exceeds the time limit may be required to take additional qualifying examinations or additional course work, or both.

6. **Language Requirements:** Some programs require reading knowledge of a language or languages other than English. Consult the departmental listings for specific language requirements.

For the Doctor of Philosophy degree in Applied Science, every student must have reading knowledge of at least one modern language other than English. Ordinarily, this language will be chosen from among French, German, and Russian. However, a student may substitute another language if, in the opinion of his Doctoral Committee, a knowledge of the substituted language would be valuable in the conduct of his research.

7. **Course of Study:** Course requirements are specified in the departmental listings, below. Planning and direction of the student's course of study are the responsibility of the head of the department or a designated departmental advisor. A specific program of study should be worked out at the time of the student's first registration, in consultation with the head of the department or an advisor, which should then be filed with the Office of Graduate Studies. This program of study is subject to later amendment.

Training in methodology may be required, at the discretion of the Department. It is expected that students working toward the degree of Doctor of Philosophy will maintain a superior average in all course work. In no case can credit be given for graduate courses in which the student does not at least have II-class standing. If a student fails to obtain II-class standing in one course he may repeat the course once only, at the discretion of the Dean of Graduate Studies and the head of the department concerned. He may not repeat more than one course.

For the Doctor of Philosophy degree in Applied Science, a student must complete successfully a minimum of six full graduate courses beyond the

Bachelor's Degree, as outlined by the Department of his chosen field of study. He must also participate in the seminars, colloquia, etc., as the Department may require.

For the Doctor of Philosophy degree in Applied Science, a student should maintain an overall average of 70% in his graduate courses. The student's Doctoral Committee will make recommendations to the Dean of Graduate Studies if his performance in the Graduate Studies is not satisfactory.

8. **Committees:** Research undertaken as part of a doctoral program is normally directed and supervised by a doctoral committee. When the student is deemed ready to undertake such research, the Head of the Department will appoint his doctoral committee, which must be approved by the Faculty Council of Graduate Studies.

The composition of the doctoral committee is specified in the Departmental listings. Each committee may include at least one member from outside the Department; such member or members need not participate in the direction of research but will be invited to contribute a judgment on its completion.

The doctoral committee is also charged with conduct of the final examination of the doctoral candidate (see below): the candidate's advisor will act as Chairman of this examination, and examiners external to the University may be added to the committee.

For the Doctor of Philosophy degree in Applied Science, each student will be assigned to a Doctoral Committee during his first year of study. The student's advisor will be the Chairman of this Committee. The Committee will consist of at least two additional members of the Department of Engineering concerned and one member from outside the Department. Further members from within or without the University may be added if this is desirable. The Advisor will advise the student in his choice of courses and guide his research. The Committee will review his progress from time to time, examine his dissertation and take part in his final oral examination.

9. **The Dissertation:** A dissertation embodying the results of an original investigation in the field of specialization is required of all candidates for the degree of Doctor of Philosophy. Before beginning his dissertation, the candidate should submit a prospectus, outlining the problem proposed. Copies of this prospectus should be filed with the doctoral committee and in the Office of Graduate Studies, not later than four weeks after the student is admitted to candidacy.

The dissertation may be submitted to an external reader or readers, who may also become part of the doctoral committee for the final examination (see below).

The general format for the dissertation is that prescribed in *The College Research Paper*, by Eugene F. Crewe and John F. Sullivan, 4th ed. (Dubuque, Iowa, 1957), which is available in the Bookstore. Within the dissertation, the student should use forms approved for scholarly publication in the field of specialization and approved by the Department. Final checking of the general format of the dissertation is the responsibility of the Office of Graduate Studies, but the student should consult his committee for instructions as to the internal form of the dissertation.

Four copies of the completed dissertation must be **submitted at least four weeks** before the oral presentation of the dissertation. The oral presentation must be completed at least two weeks prior to the Convocation at which the candidate expects to receive his degree.

The candidate must also submit at this time four copies of an abstract, no more than 500 words in length, and four copies of a *vita*, which will be bound with the thesis, and an additional copy of the abstract for national bibliographical purposes. Arrangements for binding the dissertation should be made with the University Librarian.

If approved, the dissertation becomes the property of the University. Two copies are filed in the University Library and two in the Department.

After the granting of the degree, and at such time as the Department gives approval, the University will have the dissertation microfilmed. One microfilm copy will be deposited in the University Library and will be available for interlibrary loan. The availability of the dissertation in film form will be announced by the published abstract sent to various libraries.

For the Doctor of Philosophy degree in Applied Science, the Dean of Graduate Studies, in consultation with the Doctoral Committee, may appoint one person, expert in the field but outside this University, who will review the dissertation and make recommendations. The Dean of Graduate Studies will advise the candidate's Doctoral Committee about these recommendations; the Committee will then consider them along with their own findings about the candidate's dissertation. The Dean of Graduate Studies may waive this requirement if arrangements have been made to ensure the publication of the dissertation in a recognized technical journal, either as a whole or in modified form approved by the Doctoral Committee.

10. **Examinations:** In addition to the usual examinations on course work, there are three types of special examinations which may be required (see Departmental Regulations) in the program leading to the degree of Doctor of Philosophy.

a. Qualifying Examinations: A qualifying examination is one in which the student is asked to demonstrate a reasonable mastery of the fundamentals in his major subject; it is designed to test the student's preparation for advanced graduate work. If such an examination is required, it must be administered and passed within one year after a student enters a graduate program.

b. Comprehensive Examinations: The comprehensive examination is one in which the student is asked to demonstrate a reasonable mastery of the field of his specialization; it is designed to test the student's command of knowledge and his ability to integrate that knowledge, after completion of all or most of his graduate course work. Normally, this examination is written at the end of the second year of graduate study and is a prerequisite to admission to candidacy.

c. Final Examinations: Traditionally, the final examination of a doctoral candidate is an oral defense of his dissertation. A Department may, however, permit as a substitute for this oral examination the delivery of a public lecture by the candidate or an open seminar to be conducted by the candidate for members of the Faculty and graduate students, on the subject of his research. If external examiners have been added to the doctoral committee, they should be invited to this examination, whatever form it may take.

In addition to the language examinations and course work, all students working toward the Doctor of Philosophy degree in Applied Science must meet the following requirements:

(a) At the beginning of each academic year, every student will have to satisfy his Doctoral Committee that he is qualified to proceed with his studies. To this end, the Doctoral Committee may require a written and/or oral examination.

(b) The passing of a comprehensive examination, written and/or oral, at the discretion of the Doctoral Committee, to ensure that the candidate has a thorough knowledge of his field of specialization.

(c) The passing of the final oral examination in defence of his dissertation. This examination will be conducted by a committee composed as stipulated in the general regulations for the Doctoral Programme. This Examining Committee may have available the opinion of an external examiner, if one is appointed.

THE MASTER'S DEGREE

1. **Admission Requirements:** Graduates of the University of Windsor or of other recognized colleges or universities may be admitted to programs leading to the Master's degree. A student with an Honours Baccalaureate or its equivalent, with at least II-class standing in the final year and in the major subject, may be admitted to a one-year Master's program. A student with a Bachelor's degree, with at least B standing in the final year and in the major subject, may be admitted to a two-year Master's program.

A candidate for the degree of Master of Applied Science shall hold the degree of Bachelor of Applied Science of this University or an equivalent degree in Applied Science or Engineering. (In addition, he must have an average of II standing or its equivalent in his major subjects).

An applicant having a Bachelor's degree in Science or Applied Mathematics may be admitted as a candidate on the recommendation of the Department concerned and subject to the approval of the Faculty of Graduate Studies. Candidates are urged to apply as early as possible to enable the Committee to evaluate qualifications and work out a program.

Possession of the minimum requirements does not automatically ensure acceptance.

2. **Candidacy:** A student in a one-year Master's program is also a candidate for the Master's degree. Students in the two-year Master's program are not admitted to candidacy until they have completed the first year.

3. **Residence:** Residence requirements are intended to provide for each student an adequate contact with the University, with the faculty in his field of specialization, and with the library, laboratories, and other facilities for graduate study and research. It is expected, therefore, that every student in a program leading to the Master's degree will undertake a full program of study for a minimum of one academic year or its equivalent. Application and interpretation of the residence requirement is the responsibility of the Dean of Graduate Studies, and if a student does not expect to fulfill it in the normal way, he should submit to the Dean, in writing, his reasons for departing from the norm and secure approval for his plan, before beginning his graduate program. See also the section on "Duration of Study" below.

This requirement is not intended to apply to students in the graduate programs which are available by Extension.

4. **Duration of Study:** The normal minimum duration of study for the Master's degree is one full year beyond the Honours Baccalaureate, or its equivalent. Credit for graduate study previously undertaken may be given, but the duration of study at this University may not be reduced beyond the minimum of one year.

For a student working towards a Master of Applied Science degree, the duration of the course will be adjusted individually for each candidate. A minimum of one year in residence, or equivalent, will be required. If more than six hours a week are spent in teaching or other departmental duties, additional time will be required. No candidate may be registered for the M.A.Sc. degree for more than eight years.

5. **Time Limit:** Work on a Master's degree should ordinarily be completed within three consecutive years after the student's first enrollment, except for those Master's programs available by Extension, for which the time limit is eight years. If a student seeks an extension of these time limits he should address a petition to the Dean of Graduate Studies, giving his reasons for the request and plans for the completion of his work. A student who exceeds the time limit may be required to take additional qualifying examinations or additional course work, or both.

6. **Language Requirements:** Some programs require reading knowledge of a language or languages other than English. Consult the departmental listings, below, for specific language requirements.

For a student working towards a Master of Applied Science degree, it is not obligatory to take a foreign language for credit but a candidate may be asked to demonstrate a reading knowledge of a foreign language at the discretion of the Department concerned.

7. **Course of Study:** Course requirements are specified in the departmental listings, below. Planning and direction of the student's course of study are the responsibility of the head of the department or a designated departmental advisor. A specific program of study should be worked out at the time of the student's first registration, in consultation with the head of the department or an advisor, which should then be filed with the Office of Graduate Studies. This program of study is subject to later amendment.

Training in methodology may be required, at the discretion of the Department. It is expected that students working towards the Master's degree will

maintain a II-class average in all course work. In no case can credit be given for graduate courses in which the student does not have at least II-class standing. A candidate for the Master's degree who does not obtain II-class standing in any course may repeat the course once only, and he may not repeat more than one course.

Candidates for the Master's degree in Applied Science, will be required to complete a minimum of six courses of which one to three may be replaced by a thesis. The thesis may be replaced by an equivalent amount of course work at the discretion of the Department involved, in which case a major paper and/or a comprehensive examination will be required. A "course" shall constitute not less than 50 hours of lectures or the equivalent.

8. **Committees:** Research undertaken as part of a Master's program is normally directed and supervised by a Master's committee, appointed by the Head of the Department not later than one month after registration in the student's final year, and subject to approval by the Faculty Council of Graduate Studies. The Master's Committee will consist of a chief advisor, as chairman, and two others, one of whom should, if feasible, belong to a department other than the one in which the student is majoring. If a member from another department is included, he need not participate in the direction of research but will be invited to contribute a judgment on its completion.

The Master's committee is also charged with conduct of the final examination of the Master's candidate (see below).

9. **Thesis or Major Paper:** A thesis, incorporating the results of an investigation in the field of the major subject, is required of candidates for the M.Sc. degree in Biology, in Chemistry, and in Experimental Physics, and of candidates for the M.A. degree who have chosen the first course of studies mentioned below.

Candidates for the Master of Arts degree may choose, instead of the course of study including a thesis, a program requiring additional course work and the submission of a major paper on which there will be a final examination. Candidates for the M.A.Sc. degree may, at the discretion of the Department involved, either submit a thesis or take a program including additional course work and submission of a major paper and/or a comprehensive examination. Candidates for the M.B.A. degree are required to prepare a major paper.

General format for the thesis is that prescribed in *The College Research Paper*, by Eugene F. Crewe and John F. Sullivan, 4th ed. (Dubuque, Iowa, 1957), which is available in the Bookstore. Within the thesis, the student should use forms approved for scholarly publication in the field of specialization. Final checking of the general format of the thesis is the responsibility of the Office of Graduate Studies, but the student should consult his committee for instructions as to the internal form of the thesis.

Three copies of the completed thesis (four for M.Sc. candidates) must be **submitted at least three weeks** before the oral presentation of the thesis. The oral presentation must be completed at least two weeks prior to the Convocation at which the candidate expects to receive his degree. The candidate must also submit at this time three (or four) copies of an abstract of not more than 300 words and three (or four) copies of a vita, which will be bound with the thesis. Arrangements for binding the thesis should be made with the University Librarian.

If approved, the thesis becomes the property of the University. Two copies, the original and one other, will be filed in the University Library and one copy (or two copies) in the Department.

These regulations regarding the thesis apply, *mutatis mutandis*, to the major paper, if the candidate has elected that course program.

10. **Examinations:** In addition to the usual examinations on course work, there are three types of special examinations in the program leading to the Master's degree:

a. Qualifying Examinations: A qualifying examination is one in which the student is asked to demonstrate a reasonable mastery of the fundamentals in his major subject; it is designed to test the student's preparation for advanced graduate work. If such an examination is required, it must be administered and passed before the student registers for his final year of Master's work.

b. Comprehensive Examinations: The comprehensive examination is one in which the student is asked to demonstrate a reasonable mastery of the field of his specialization; it is designed to test the student's command of knowledge and his ability to integrate that knowledge, after completion of all or most of his graduate course work. Normally, this examination is written at the end of the student's final year of study for the Master's degree.

c. Final Examinations: Traditionally, the final examination of a candidate for a Master's degree is an oral defense of his thesis or major paper. A Department may, however, permit as a substitute for this oral examination an open seminar to be conducted by the candidate for graduate students and faculty in his Department, on the subject of his research.

PROGRAMS OF STUDY

BIOLOGY

Professors: R. J. Doyle, Ph.D., Head of Department.
W. G. Benedict, Ph.D.

Associate Professors: M. L. Petras, Ph.D.
H. D. McCurdy, Ph.D.
L. R. Sabina, Ph.D.

Assistant Professors: J. R. Dougherty, C.S.B., M.S.
D. T. N. Pillay, Ph.D.
J. E. J. Habowsky, Ph.D.
A. H. Warner, Ph.D.

I. THE DOCTOR OF PHILOSOPHY DEGREE

In addition to the general requirements listed on page G-11 ff., the following requirements must be met by all students proceeding to the Ph.D. degree.

1. Admission Requirements:

A candidate for the degree of Doctor of Philosophy in Biology must be a graduate of a recognized College or University with an Honours degree in Biology or equivalent, or a degree in a related field acceptable to the department.

2. Course Work:

Candidates for the Ph.D. degree must successfully complete five full courses beyond the Honours bachelor level. These courses will include three in the major field and two in the minor field. A candidate must maintain a "B" in all courses in Biology and a "B" average in the minor area. Any student whose performance is deemed unsatisfactory on course work or research will be asked to withdraw. A student is required to attend and, as requested, deliver, departmental seminars each year of graduate study.

3. Doctoral Committee:

Within one month after a candidate's registration, the Head of the Department will, in consultation with the Dean of Graduate Studies, assign a temporary advisor to assist the student in his program. Not later than the time of departmental approval as a candidate, the student will be assigned an advisory committee which will consist of at least four members, one of whom must be from outside the department. The research advisor will act as chairman of this committee. The committee will review the student's progress from time to time, examine his dissertation and take part in his final oral examination.

4. Dissertation:

A dissertation embodying the results of an original investigation in the field of the major subject is required of all candidates. It is expected that this will be of a quality suitable for publication in an acceptable biological journal.

5. Language Requirements:

The student will be expected to demonstrate by written examination a reading knowledge of two languages other than English. The choice of these languages will be made by the advisory committee in conformity with the student's research interests.

6. Examinations:

The Graduate Record Examination will be required of every student pursuing Graduate Studies. For general requirements governing examinations see page G-14. In addition, written qualifying examinations will normally be required of all students. Comprehensive examinations will be held in both major and minor fields.

II. THE MASTER OF SCIENCE DEGREE

Particular Requirements:

(i) In addition to the general requirements listed on page G-16 for the Master's degree, the candidate shall (1) successfully complete three full courses, one of which may be selected from a cognate field, (2) conduct a seminar each year of his registration, and (3) complete original research work and embody it in a thesis.

(ii) The candidate for the Master's degree shall successfully pass an examination to test reading knowledge in a language other than English. The language will be selected in consultation with the Department Head and the examination will be given in conjunction with the Language Department.

(iii) The Graduate Record Examination will be required of every student pursuing Graduate Studies.

III. DETAILS OF SUBJECTS

Not all of the courses listed will necessarily be offered in any one year.

I. BOTANY

540a. Plant Physiology: Cellular functions, water relations and inorganic nutrition. *(2 lectures, 3 laboratory hours a week (half course).)*

540b. Plant Physiology: Plant metabolism, growth and development. *(2 lectures, 3 laboratory hours a week (half course).)*

541a. Plant Pathology: The symptomatology, epidemiology and histology of plant diseases. *(2 lectures, 3 laboratory hours a week (half course).)*

541b. Plant Pathology: The biological and biochemical aspects of plant disease control. *(2 lectures, 3 laboratory hours a week (half course).)*

542a. Physiology of Plant Parasitism: The parasitic activity of facultative plant parasites. *(2 lectures, 3 laboratory hours a week (half course).)*

542b. Physiology of Plant Parasitism: The influence of environment on plant disease expression. *(2 lectures, 3 laboratory hours a week (half course).)*

543c. Plant Viruses and Virus Diseases: The sympotomatology, transmissability and physiology of infection of plant viruses. *(2 lectures, 3 laboratory hours a week (half course).)*

544b. Plant Growth Substances: Nature and physiological effects of auxins, gibberellins, kinins, inhibitors and growth retardants. *(2 lecture hours per week (half course).)*

550y. Seminar: Presentation and discussion of brief reviews of current botanical literature. *(1 hour a week (half course).* May be repeated once only for credit.

555c. Special Topics in Botany: Selected topics of current interest. (Prerequisite: consent of instructor. *(2 hours a week.)*

II. MICROBIOLOGY

529a. Microbial Genetics: The genetics of bacteria, fungi, and viruses. *(3 lectures a week (half course).)*

531b. Virology and Cell Culture: An advanced course to acquaint students with the fundamental principles of virology and special cell culture techniques. *(1 lecture, 6 laboratory hours a week (half course).)*

540b. Microbial Physiology: Cytochemistry, nutrition, metabolism and population kinetics of microorganisms. *(2 lectures, 4 laboratory hours a week (half course).)*

550y. Seminar: Presentation and discussion of brief reviews of current literature in microbiology. *(1 hour a week (half course).)* May be repeated once only for credit.

555c. Special Topics in Microbiology: Selected topics of current interest in microbiology. (Prerequisite: consent of instructor). *(2 hours a week.)*

III. ZOOLOGY

529a. Mammalian Genetics: The genetic control of morphological and biochemical variants, qualitative traits and certain developmental phenomena in mammals. *(3 lecture hours a week (half course).)*

529b. Population Genetics: The genetics of populations composed of bisexual organisms. *(3 lecture hours a week (half course).)*

543. Aquatic Biology: Physical and chemical properties of natural waters in relation to biotic communities in the aquatic environment. *(2 lectures, 3 laboratory a week.)*

544b. Developmental Biology: A study of nucleocytoplasmic interactions and the role of the nucleic acids during embryonic development. (Prerequisite: Zoology 34a, Chemistry 36, and/or consent of instructor). *(3 lectures a week; one semester (half course).)*

548b. Microtechniques: A laboratory course introducing a variety of research techniques: embedding and sectioning, staining, cyto- and histochemical methods, photomicrography, electron microscopy, and similar techniques. (Prerequisites: Biology 228a, and consent of instructor). *(2 lectures, 4 laboratory hours a week, one semester (half course).)*

550y. Seminar: Presentation and discussion of brief reviews of current literature in the field of zoology. *(1 hour a week (half course).)* May be repeated once only for credit.

555c. Special Topics in Zoology: Selected topics of current interest. (Prerequisite: consent of instructor). *(2 hours a week.)*

562b. Radiobiology: The effects of nuclear and ultra-violet irradiation on the integrity of biological systems. (Prerequisite: Chemistry 562b). *(3 lectures a week, one semester.)*

BUSINESS ADMINISTRATION

Professors: G. R. Horne, B.A., M.A., Ph.D., Dean.
Michael Zin, B.Comm., M.B.A., Ph.D.
C. M. Birch, B.A., M.A., Ph.D.

Associate Professors: J. B. Gertz, B.S., M.B.A.
J. M. Brownlie, B.A., M.B.A.
E. M. Basic, B.S.E.E., B.S.M.E., M.B.A., Ph.D.

Assistant Professors: P. B. Buchan, B.A.Sc., M.Comm.
*M. D. Beckman, Th.B., B.Sc., M.B.A.
A. J. Murray, B.Comm., M.B.A., Ph.D.
R. W. Stolar, B.Comm., M.B.A., C.A.

I. THE MASTER OF BUSINESS ADMINISTRATION DEGREE

The purpose of the Master of Business Administration program is to provide broad post-graduate studies in the general field of business administration. The graduate student is afforded the opportunity to expand his knowledge of the principal phases of business administration, and thereby be prepared for responsible performance in private business and public service careers.

The general principles of management are emphasized throughout the program; this approach is supplemented by the use of the case method of instruction to bring reality to the studies.

Particular Admission Requirements:

1. Graduates with the Bachelor of Commerce Honours (4 years from Grade XIII) from this or other universities, with second class standing, who have done satisfactory work in all the subjects included in the first year of the Master's program as indicated below, are eligible to complete the degree in one year.

2. Graduates who have done work elsewhere comparable to that included in the first year of the Master's program here will be eligible to enter the second year.

3. Applicants possessing the Bachelor of Commerce General Degree or equivalent, will be required to take courses as approved by the Dean of the Faculty of Business Administration.

4. Students are admitted to the second year if they have secured an average of second class standing in the required subjects of the first year. A second class average is required in the second year to receive the M.B.A. degree. All marks will be counted in computing the average for any year, but no credit will be given for any course with a mark of less than 60.

5. Applicants are required to take the Admissions Test for Graduate Study in Business.

Evening Students. Provision is made for candidates in full-time employment to spread the work for the degree over a number of years. There is no time limit for the work of the first year but the work of the second year must be covered in not more than four consecutive years. Only two subjects may be taken concurrently by part-time students.

First Year

Bus. Ad. 501ab	Statistical Methods in Business.
Bus. Ad. 503ab	Marketing.
Bus. Ad. 505ab	Organizational Behaviour, Industrial Relations.
Bus. Ad. 509	Accounting.
Bus. Ad. 513	Corporation Finance.
Bus. Ad. 517b	Production Management.
Bus. Ad. 523a	Computers and Systems Analysis.

*On leave of absence.

Second Year

Bus. Ad. 550ab Business Policy.
Bus. Ad. 554ab Administrative Accounting.

Three full courses chosen from the following:

Bus. Ad. 552ab Administrative Problems.
Bus. Ad. 556c Contemporary Business Problems.
Bus. Ad. 557c Production.
Bus. Ad. 558ab Marketing Management and Strategy.
Bus. Ad. 559c Marketing Research and Analysis.
Bus. Ad. 560ab International Business Operations I and II.
Bus. Ad. 561ab Investment Analysis and Management.
Bus. Ad. 563c Human Relations in the Industrial Community.
Bus. Ad. 564ab Public Administration.
Bus. Ad. 566ab Statistical Analysis.
Bus. Ad. 568c Accounting Theory—Assets.
Bus. Ad. 569c Accounting Theory—Equities.
Bus. Ad. 570c Financial Management—Short and Intermediate Term.
Bus. Ad. 571c Financial Management—Long Term.

One subject (for which the student must have the undergraduate qualifications) from other graduate courses, if approved by the Dean of the Faculty of Business Administration and the Department concerned.

In addition to the subjects listed, the student is required to prepare a paper on some research subject.

The prerequisite for a second term course is its corresponding first term course. The letter "c" has no prerequisite second year course.

Diploma in Management

Upon completion of the first year M.B.A. program with an average of "B" or better, a student who is **not able to continue** in the M.B.A. program may apply for a Diploma in Management.

DETAILS OF SUBJECTS

501a. Statistical Methods in Business I: Description of sample data, probability, theoretical distributions, sampling, estimation, hypothesis testing, correlation, regression, time series and index numbers. *(3 hours a week, one semester.)*

501b. Statistical Methods in Business II: The application of statistics to a wide variety of problems in business. *(3 hours a week, one semester.)*

503a. Marketing Principles and Policies I: Marketing policy formation and application to problems of consumers, merchandising and channels of distribution. *(3 hours a week, one semester.)*

503b. Marketing Principles and Policies II: The management of personal selling and sales promotion, pricing, marketing research and integrated marketing programs. *(3 hours a week, one semester.)*

505a. Organizational Behaviour: A study of individual and group behaviour in business organizations. The course is designed to help those intending to assume positions of leadership in commerce and industry by enabling them to improve their competency in understanding and dealing with the human problem of administration. *(3 hours a week, one semester.)*

505b. Industrial Relations: A case course stressing worker-management relations under unionized conditions. *(2 hours a week, one semester.)*

509. Accounting: Accounting concepts and techniques as tools for the administration of the economic activity of the business enterprise. *(6 hours a week, one semester.)*

513. Corporation Finance: A basic course in business finance. Taught with emphasis on analysis rather than description with the object of demonstrating principles. *(6 hours a week, one semester.)*

517b. Production Management: A study of the production function in modern industry; application of analytical tools (including operations research) emphasized in solving production problems. *(3 hours a week, one semester.)*

523a. Computers and Systems Analysis: A fundamental appraisal of computers and E.D.P. systems for modern management. *(3 hours a week, one semester.)*

550a. Business Policy I: Development of theory and concepts to aid executives responsible for guiding business enterprises in making decisions. *(3 hours a week, one semester.)*
550b. Business Policy II: A continuation of 500a, with more complex applications. *(3 hours a week, one semester.)*

552a. Administrative Problems I: The basic problems facing the senior administrator; management's responsibilities of organizing, planning, leading, measuring and controlling. *(3 hours a week, one semester.)*

552b. Administrative Problems II: The work of the first term is built upon and integrated with consideration of administrative problems of a large number of companies in widely diversified industries. The 1620 Computer is used to simulate competitive situations. *(3 hours a week, one semester.)*

554a. Administrative Accounting I: The role of accounting in communicating financial information to various levels of management as a basis for administrative decisions. *(3 hours a week, one semester.)*

554b. Administrative Accounting II: Development of methods and techniques to control non-manufacturing costs and joint costs; product pricing; intercompany pricing; capital expenditure programs and contemporary accounting problems. *(3 hours a week, one semester.)*

556c. Contemporary Business Problems: A search for countervailing power as an alternative to greater direction by government in solving current problems. *(3 hours a week, one semester.)*

557c. Production: A review of the latest analytical tools of economics and mathematics and their application to solving production problems, thereby bridging the gap between the new insights, theories, and methods of management science, and the needs of the production manager. Some knowledge of mathematics (including an introduction to calculus) is assumed. *(3 hours a week, one semester.)*

558a. Marketing Management: The factors affecting consumer demand and the methods of satisfying it. Stress is placed on the organization and management aspect of the subject. *(3 hours a week, one semester.)*

558b. Marketing Strategy: The significance of products, pricing, promotion, distribution and the consumer in the formulation of both long-term and current plans for market development. *(3 hours a week, one semester.)*

559c. Marketing Research and Analysis: Analysis of methods of investigation that can be used to solve marketing problems. Nature and scope of marketing research; planning of investigations; use of secondary data; sampling; construction of communication forms; control of field activities; tabulation and analysis of results. Techniques of specialized research activities. *(3 hours a week, one semester.)*

560a. International Business Operations I: An integration of the environmental and functional areas of business focussed on the problems of managing the multinational business organization. *(3 hours a week, one semester.)*

560b. International Business Operations II: A continuation of Bus. Ad. 560a. Cases dealing with international business organizations are used as a basis for analysis. *(3 hours a week, one semester.)*

561a. Investment Analysis and Management I: Types of corporate securities for investment; theory and mechanics of investment; general analysis and valuation procedures. *(3 hours a week, one semester.)*

561b. Investment Analysis and Management II: Valuation of fixed income securities and common stocks; procedures in analysis of government, industrial, financial and public utility securities; portfolio management. *(3 hours a week, one semester.)*

563c. Human Relations in the Industrial Community: A graduate seminar designed for those who will be concerned with administration of the human resources in the business community. Study is programmed to encourage the student to formulate acceptable theory and sound personnel principles. *(3 hours a week, one semester.)*

564a. Public Administration I.

564b. Public Administration II.

566a. Statistical Analysis I: The application of statistical techniques to business decisions; emphasis on decision problems under uncertainty; use of probabilities, statistical decision rules, and the sampling of measured values. *(3 hours a week, one semester.)*

566b. Statistical Analysis II: A continuation of Bus. Ad. 516a. *(3 hours a week, one semester.)*

568c. Accounting Theory — Assets: A review of current accounting literature relating to an evaluation of accounting concepts and standards. Emphasis is upon their application to assets and income determination. *(3 hours a week, one semester.)*

569c. Accounting Theory — Equities: A review of current accounting literature relating to an evolution of accounting concepts and standards. Emphasis is upon their application to the determination, measurement, classification and reporting of equities. *(3 hours a week, one semester.)*

570c. Financial Management (Short and Intermediate Term): The working capital problems of business enterprises; function and theory of working capital; sources of working capital; factors determining working capital needs; techniques of forecasting needs; and preparing budgets. *(3 hours a week, one semester.)*

571c. Financial Management (Long Term): Problems in effective acquisition and utilization of capital resources. Planning the capital structure; financial programs; appraising return on investment; allocation of funds among investment opportunities; dividend policies; valuation and merger; reorganization. *(3 hours a week, one semester.)*

CHEMICAL ENGINEERING

Professor: M. Adelman, Ph.D., Head of Department.

Associate Professors: A. W. Gnyp, Ph.D.
R. A. Stager, M.A.Sc., Ph.D.

Assistant Professors: G. P. Mathur, Ph.D.
C. C. St. Pierre, Ph.D.

For requirements for the degree of Doctor of Philosophy in Applied Science, the General Regulations of the Faculty of Graduate Studies should be consulted (p. G-11). For requirements for the degree of Master of Applied Science consult p. G-16.

Ch.E. 500. Seminar.

Ch.E. 501c. Transport Phenomena I: General transport theory; fundamentals of momentum transfer, Navier-Stokes equation, compressible flow. Fundamentals of heat transfer; conductive and radiative heat transfer. *(3 hours a week, one semester.)*

Ch.E. 502c. Chemical Engineering Thermodynamics: An advanced study of the application of classical thermodynamic principles to chemical engineering practice; flow systems; composition relationships between equilibrium phases; systems involving surface effects, electric or magnetic fields; Third Law. *(3 hours a week, one semester.)*

Ch.E. 503c. Process Control and Instrumentation: A study of the important principles of automatic control with particular emphasis on process control, beginning with process analysis and continuing into generalized behavior of closed-loop systems. The theory, selection and application of control elements are also studied, employing practical system problems encountered in Chemical Engineering. *(3 hours a week, one semester.)*

Ch.E. 504c. Chemical Engineering Kinetics: An advanced study of the application of kinetic principles to chemical reactor design, analysis of batch reactor data, design of ideal backmix and plug flow reactors, design considerations for multiple reactions, non ideal mixing. *(3 hours a week, one semester.)*

Ch.E. 505c. Electrochemical Engineering: Origin of the electrical potential difference. Electrolytic conduction, Debye-Huckel theory, double layer, static electrification, passage of current through electrolytic cell. *(3 hours a week, one semester.)*

Ch.E. 506c. Mathematical Methods in Chemical Engineering I: Application of ordinary differential equations to chemical engineering problems; series solution; Bessel's equation, Legendre's equation, formulation and solution of partial differential equations, Fourier series. *(3 hours a week, one semester.)*

Ch.E. 507c. Non-Newtonian Fluid Technology: Formulation of stress and strain tensors. Constitutive equation and its derivation. Rheological classification of industrially important non-Newtonian fluids. The viscometry of non-Newtonian fluids, non-Newtonian fluid boundary layer equation, heat transfer, pipe line design, and mixing of non-Newtonian fluids. *(3 hours a week, one semester.)*

Ch.E. 511c. Transport Phenomena II: Convective heat transfer. Fundamentals of mass transfer, the diffusion equation, film theory, penetration theory. Simultaneous heat, mass and momentum transfer. (Prerequisite: Transport Phenomena I). *(3 hours a week, one semester.)*

Ch.E. 512c. Statistical Mechanics of Reversible and Irreversible Changes: H-theorem. Ensemble theory. Gibb's theory: average quantities. Introduction to quantum statistical mechanics. Irreversible phenomena: phenomenological approach, the molecular approach, thermal conduction, thermomechanical effects, thermoelectric effects, disequilibrium of several variables. *(3 hours a week, one semester.)*

Ch.E. 514c. Heterogeneous Reactor Design: Rate phenomena in catalytic and non-catalytic systems, significance of physical transfer equations in catalytic reactor design. *(3 hours a week, one semester.)*

Ch.E. 516c. Mathematical Methods in Chemical Engineering II: Complex algebra; integral transforms, special functions, vector analysis, numerical methods, matrices, applications to chemical engineering problems. *(3 hours a week, one semester.)*

Ch.E. 521c. Optimization Techniques for Chemical Systems: Theory of maxima and minima, comparison of the techniques for optimization, application of optimization methods to chemical engineering systems. *(3 hours a week, one semester.)*

Ch.E. 522. Corrosion: Clean surfaces, surface damage to metals, effect of imperfections on dissolution, electrode solution interfaces, electrolytic etching of metals, electrochemistry of dissolution, dissolution of metals, oxidation of metals. *(2 hours a week, two semesters.)*

Ch.E. 590c. Selected Topics in Chemical Engineering: A study of selected topics of current interest to chemical engineering. *(3 hours a week, one semester.)*

CHEMISTRY

Professors: K. G. Rutherford, B.A., Ph.D., Head of Department.
F. A. DeMarco, B.A.Sc., M.A.Sc., Ph.D.
R. J. Thibert, B.A., M.S., Ph.D.

Associate Professors: *Rev. G. W. Kosicki, C.S.B., B.A., M.S., Ph.D.
S. J. W. Price, B.Sc., M.Sc., Ph.D.
W. J. Holland, B.S., M.S., Ph.D.

Assistant Professors: G. W. Wood, B.Sc., M.Sc., Ph.D.
D. J. McKenney, B.Sc., M.Sc., Ph.D.
R. C. Rumfeldt, B.Sc., Ph.D.
E. J. Bounsall, B.A.Sc., M.A., D.I.C., Ph.D.

*On leave of absence.

I. THE DOCTOR OF PHILOSOPHY DEGREE

1. Particular Requirements:

In addition to the general requirements listed on page G-11 ff., the following requirements must be met by all students proceeding to the Ph.D. degree.

Course Work:

Graduate students proceeding to the Ph.D. degree must successfully complete the following minimum course work:

(a) Six full courses, as approved by the Department, to be chosen from the available graduate offerings in the student's field, as well as from related and cognate courses.

(b) Seminar to be taken each year the student is registered.

Advanced credit for graduate courses previously taken may be given up to a maximum of three full courses.

No student may elect to take more than ten courses, without the consent of the major advisor.

Any student who fails to maintain satisfactory standing in all course and dissertation work may be asked to withdraw.

2. Doctoral Committee:

Within one year after registration, the Head of the Department will, in consultation with the Dean of Graduate Studies, assign the graduate student's doctoral committee. This committee will consist of four members, three of whom are to be chosen from the Chemistry Department and one from outside the Department (preferably from a cognate field). This committee will meet with the student at least once to review his progress.

3. Language Requirements:

The student will be expected to demonstrate by written examination a reading knowledge of:

(a) German or Russian

(b) another language as approved by the Department.

The language examinations will be offered annually in conjunction with the Department of Modern Languages and must be successfully passed before admittance to the Comprehensive Examination.

4. Dissertation:

A dissertation embodying the results of an original investigation in the field of the major subject is required of candidates for the Ph.D. degree. For general requirements, see page G-11.

5. Examinations:

In addition to the language examinations and course work, all students proceeding to the Ph.D. degree must meet the following additional requirements:

(a) Comprehensive Examination:

A reasonable mastery of the field of specialization chosen, tested by a comprehensive written examination given normally at the end of the second year of graduate study.

(b) Final Examination:

The passing of a final oral examination in defense of the dissertation. An examiner from outside the institution, chosen by the candidate's major advisor, may be present at the defense of the dissertation at the discretion of the Department.

For description of the above types of the examination, see page G-14.

II. THE MASTER OF SCIENCE DEGREE

Particular Requirements:

In addition to the general requirements and stipulations on page G-16 ff. for the Master's degree, the following course requirements must be met by all candidates; the successful completion of at least three and not more than five full courses, as approved by the Department, to be chosen from the available graduate offerings in the student's field, as well as from related and cognate courses. A seminar must be taken each year the candidate is registered, and original research work must be pursued and embodied in a thesis. All courses will be selected in consultation with the Department to suit the candidate's major field of study.

In addition the Master's candidate must successfully pass an examination to test reading knowledge in a language other than English. The language will be selected in consultation with the Department and the examination will be given in conjunction with the Department of Modern Languages.

III. DETAILS OF SUBJECTS

Not all of the courses listed will necessarily be offered in any one year. Special topics courses can be taken several times provided the course content is different.

I. ANALYTICAL CHEMISTRY

532. Advanced Analytical Chemistry: The analysis of alloys, minerals and ores employing titrimetric, gravimetric and instrumental methods. (Prerequisite: Chemistry 332). *(2 lectures, 3 laboratory hours a week.)*

542a. Instrumental Analysis: Ultraviolet, visible and infrared spectroscopy; polarography, colorimetry, conductometric titrations, coulometric titrations, electroanalytical methods. (Prerequisite: Chemistry 332). *(2 lectures, 3 laboratory hours a week, one semester.)*

552b. Special Topics in Analytical Chemistry: Frontiers in the field of analytical chemistry. (Prerequisite: Chemistry 332). *(2 lectures a week, one semester.)*

562a. Radiochemistry: Properties and safe handling of radioactive substances. Experiments dealing with the identification and use of various radioactive isotopes. (Prerequisite: Consent of Instructor). *(2 lectures, 3 laboratory hours a week, one semester.)*

562b. Radiochemistry: Application of tracer techniques to various phases of chemistry. (Prerequisite: Chemistry 562a or equivalent). *(2 lectures a week, one semester.)*

II. BIOCHEMISTRY

536. General Biochemistry: An introductory course in Biochemistry. (Prerequisite: Chemistry 333). *(3 lectures, 3 laboratory hours a week.)*

536x. Same as Chemistry 536 but without laboratory.

546a. Intermediate Biochemistry: A study of enzymes. Literature and/or term paper required. (Prerequisite: Chemistry 536 or equivalent). *(3 lectures a week, one semester.)*

546b. Intermediate Biochemistry: A study of hormones. Literature and/or term paper required. (Prerequisite: Chemistry 536 or equivalent). *(3 lectures a week, one semester.)*

556a. Special Topics in Biochemistry. (Prerequisite: Chemistry 536 or 536x or equivalent). *(3 lectures a week, first semester.)*

556b. Special Topics in Biochemistry. (Prerequisite: Chemistry 536 or 536x or equivalent). *(3 lectures a week, second semester.)*

566a. Biochemical Research Methodology: A study of the current methods used in Biochemistry with emphasis on analytical methods. *(1 lecture, 3 laboratory hours a week, one semester.)*

566b. Biochemical Research Methodology: A study of the current methods used in Biochemistry with emphasis on analytical methods. *(1 lecture, 3 laboratory hours a week, one semester.)*

III. INORGANIC CHEMISTRY

535a. An Introduction to Coordination Chemistry: A general survey of coordination compounds; modern theories of coordination chemistry; isomerism in complex compounds. (Prerequisite: Chemistry 335). *(2 lectures a week, one semester.)*

535b. Chemistry of the Less Familiar Elements: Descriptive chemistry of the less familiar elements and their compounds, with emphasis on coordination chemistry. (Prerequisite: Chemistry 335). *(2 lectures a week, one semester.)*

545. Theoretical Inorganic Chemistry: Theoretical considerations of the periodic relationships and reactivities of the elements and their compounds, particularly in the light of recent structural, thermodynamic and kinetic data relating to aqueous and non-aqueous solutions, dry state reactions and high temperature chemistry. (Prerequisite: Chemistry 335). *(2 lectures a week.)*

555. Selected Topics in Inorganic Chemistry: Topics to be arranged by the instructor based primarily upon new developments in the field as gathered from a study of the current research literature. (Prerequisite: Chemistry 535a and 535b). *(2 lectures a week.)*

IV. ORGANIC CHEMISTRY

533. Physical Organic Chemistry: Applications of thermodynamics and kinetics to organic reaction mechanisms. Mass law, ionic strength and salt effects as well as polar and steric effects are discussed from the physiochemical standpoint. (Prerequisite: Chemistry 333, 444 and 464). *(2 lectures a week.)*

543. Synthetic Organic Chemistry: A detailed study of organic reactions with particular reference to multistage syntheses. Stereospecific synthesis. (Prerequisite: Chemistry 333). *(2 lectures a week.)*

553a. Organic Chemistry of High Polymers: Condensation and addition polymers. Stereospecific polymerization. (Prerequisite: Chemistry 333, 444 and 464). *(2 lectures a week, one semester.)*

553b. Heterocyclic Compounds: The chemistry of heterocyclic organic compounds. (Prerequisite: Chemistry 333). *(2 lectures a week, one semester.)*

563. Natural Products: The organic chemistry of the steroids, terpenes, vitamins and drugs. (Prerequisite: Chemistry 543). *(2 lectures a week.)*

573a. Special Topics in Organic Chemistry: Selected topics of recent interest in the field. (Prerequisite: consent of instructor). *(2 lectures a week, one semester.)*

V. PHYSICAL CHEMISTRY

544. Physical Chemistry of High Polymers: Kinetics of condensation and addition polymerization. Physical and thermodynamic properties. Degradation of high polymers. (Prerequisite: Chemistry 444 and 464). *(2 lectures a week.)*

554. Theoretical Chemistry: Statistical and quantum mechanics. Atomic and molecular spectra. (Prerequisite: Chemistry 444). *(2 lectures a week.)*

564. Gas Kinetics: Theoretical and experimental aspects of gas phase reactions. (Prerequisite: Chemistry 444). *(2 lectures a week.)*

574a. Special Topics in Physical Chemistry: Selected topics of current interest. (Prerequisite: consent of instructor). *(2 lectures a week, one semester.)*

574b. Special Topics in Physical Chemistry: Selected topics of current interest. (Prerequisite: consent of instructor). *(2 lectures a week, one semester.)*

584a. Energy Transfer: Mechanisms of energy transfer in simple molecules. *(2 lectures a week, one semester.)*

584b. Gas Chromatography: Theoretical and experimental aspects of gas phase chromatography. *(2 lectures a week, one semester.)*

VI. MASTER'S THESIS

VII. 550. Seminar

VIII. DOCTORAL DISSERTATION

CIVIL ENGINEERING

Professor: J. B. Kennedy, Ph.D., Head of Department.

Associate Professors: J. P. Hartt, M.S.C.E.
J. T. Laba, M.A.Sc.
C. MacInnis, Ph.D.

Assistant Professors: D. E. L. Maasland, Ph.D.
W. McVinnie, Ph.D.

Lecturer: J. A. McCorquodale, M.Sc.

For requirements for the degree of Doctor of Philosophy in Applied Science, the General Regulations of the Faculty of Graduate Studies should be consulted (p. G-11). For requirements for the degree of Master of Applied Science consult p. G-16.

DETAILS OF SUBJECTS

C.E. 501c. Advanced Structural Analysis I: Analysis of multi-story frames and space frames by force, displacement and iterative methods; treatment of non-prismatic and curved members; non-rigid connections; introduction to the use of digital computation in structural analysis; energy methods. *(3 hours a week, one semester.)*

C.E. 502c. Advanced Structural Analysis II: Deflection theory of suspension systems, flexible arches; analysis of structures with axial load effects, materials beyond elastic limit, thermal stresses; shearwall structures; framing system subject to combined bending and torsion. *(3 hours a week, one semester.)*

C.E. 504a. Analysis and Design of Shell Structures I: Membrane stresses in shells of revolution, cylindrical shells, shells of double curvatures, prismatic shells; deformation shells. *(3 hours a week, one semester.)*

C.E. 504b. Analysis and Design of Shell Structures II: Bending stresses in circular cylindrical shells, shells of revolution; buckling of shells; design of cylindrical roofs, domes, folded-plate and curved shell structures; limitations of elastic analysis; elements of plastic strength analysis. *(3 hours a week, one semester.)*

C.E. 505c. Structural Analysis For Dynamic Loads: Behaviour of structural materials under dynamic loading; response of beams, frames, trusses to dynamic loads; lumped and distributed mass systems; energy methods and numerical procedure; elastic-plastic response. *(3 hours a week, one semester.)*

C.E. 506c. Plastic Analysis and Design of Metallic Structures: Stress-strain relationship; moment-rotation characteristics; plastic analysis of beams and frames; deflections; effect of shear and longitudinal force; optimum design; shakedown; design considerations. *(3 hours a week, one semester.)*

C.E. 507c. Prestressed Concrete: Principles of prestressing; materials; prestressing systems; prestress losses; analysis and design of statically determinate and indeterminate structures; design codes; research background. *(3 hours a week, one semester.)*

C.E. 508. Concrete Technology: Cementing materials — Portland cements, aluminous cement, pozzolanic materials; aggregate materials — geology and petrography of concrete aggregates, exploration for, evaluation of and processing methods of aggregates. Admixtures — especially air-entraining agents. Proportioning of concrete mixes — batching, mixing, conveying. Placing and curing methods. Properties of fresh and hardened concrete. Statistics applied to the control of concrete quality. Special concretes, e.g. light weight concretes, concrete for nuclear shielding. *(2 hours a week.)*

C.E. 510a. Theory of Elasticity I: Analysis of stress; analysis of strain; stress-strain relations and the general equations of elasticity; plane-stress and plane-stress problems, including rotating disks, reinforced disks, and thermal stresses; St. Venant's theory of torsion; torsion of various-shaped bars. *(3 hours a week, one semester.)*

C.E. 510b. Theory of Elasticity II: Energy principles and variational methods; application of complex variable theory to elastic problems; numerical methods in the theory of elasticity. *(3 hours a week, one semester.)*

C.E. 511c. Bending and Buckling Theory of Plates: Bending of long rectangular plates to a cylindrical surface; pure bending of plates; small deflections of laterally loaded circular and rectangular plates with various edge conditions; plates under combined action of lateral forces and axial loads; large deflections; buckling of plates under axial and shear loads; energy method; finite-difference approximation. *(3 hours a week, one semester.)*

C.E. 512c. Theory of Elastic Stability: Differential equation for beam-columns; problems with various boundary conditions; elastic buckling of bars and frames; buckling of bars on elastic foundations; flexible bars; torsional buckling; lateral buckling of beams; buckling of rings; curved bars and arches; energy and numerical methods. *(3 hours a week, one semester.)*

C.E. 520 (C.E. 510). Advanced Water and Waste Water Treatment: Characteristics of water and waste water, both chemical and biological, and their influence on the design of treatment facilities. Selected papers covering the more recent advances in the field. *(2 hours a week.)*

C.E. 525 (C.E. 515). The Engineer In Public Health: Epidemiology of communicable disease, food sanitation, swimming pools and bathing beaches, vectors and their control, collection and disposal of municipal refuse, and the effect of substandard housing on the health of the community. *(2 hours a week.)*

C.E. 530. Traffic Engineering: Basic characteristics of traffic, road users, vehicles, speeds, volumes, etc.; traffic surveys; basic considerations in traffic regulation; control devices and aids; factors in traffic design; traffic engineering functions and organizations. *(2 hours a week.)*

C.E. 531c (C.E. 513). Advanced Highway Design: Special problems on stabilization, bases, subgrades, pavements, drainage, frost action. Emphasis on modern approach to geometric design of rural and urban highways. Course includes complete highway design and occasional laboratory. *(3 hours a week, one semester.)*

C.E. 532c (C.E. 514b). Modern Airport Design: Selection of site, runways, modern rigid pavements, stabilization of subgrades, frost action, drainage; course includes airport design problems and projects. *(3 hours a week, one semester.)*

C.E. 540 (C.E. 512). Advanced Soil Mechanics and Applications: Properties of soils, stresses, consolidation, settlements, bearing capacity, stability of slopes, flownets and seepage, stabilization of soils, special problems on buildings, highway and airport foundations, tunnels, underground conduits. Course includes laboratory testing. *(2 hours a week.)*

C.E. 541c (C.E. 514a). Advanced Problems In Foundations: Combined footings, Mat and Raft foundations, group piling, retaining walls, abutments, vibrations in foundations. *(3 hours a week, one semester.)*

C.E. 550 (C.E. 508). Water Power: Stream flow and water power estimates; storage; problems; analysis, design and selection of water power structures and equipment; types and purposes of dams and weirs; turbine analysis; transmission lines; cost and value of water power; typical problems will be studied. *(2 hours a week.)*

C.E. 551 (C.E. 511). Advanced Hydrology: Analysis and synthesis of the hydrograph. Stream-flow routing. The hydrograph as a function of drainage characteristics; estimation of runoff from Meteorological data. Infiltration theory. Sea water intrusion in coastal Aquifers. Application of hydrologic techniques. *(2 hours a week.)*

C.E. 552a. Open Channel Hydraulics: Theory and analysis of uniform, gradually varied, rapidly varied and unsteady flow in open channels; sediment transportation; design of channels. *(3 hours a week, one semester.)*

C.E. 552b (C.E. 509). Advanced Hydromechanics: Dimensional analysis; similarity and model testing in hydraulic structures and hydraulic machinery; special model laws and practical applications. *(3 hours a week, one semester.)*

C.E. 553a. Ground Water and Seepage: Theory and analysis of ground water flow problems. Confined and unconfined flow. Seepage below dams. Well problems. Theory of models. *(3 hours a week, one semester.)*

C.E. 554c. Treatment of Experimental Data: Frequency distributions; measure of central tendency and dispersion; probability; discrete and continuous distributions; the Chi, "t", and the "F" ratio tests; linear and non-linear trends; principle of least squares; correlations; tolerance and control charts; introduction to analysis of variance. Applications. *(3 hours a week, one semester.)*

C.E. 560c. Special Topics: Selected advanced topics in the field of Civil Engineering. *(3 hours a week, one semester.)*

ECONOMICS

Professors: W. G. Phillips, Ph.D., Head of Department.
Z. M. Fallenbuchl, Ph.D.

Associate Professors: *A. E. Kovacs, Ph.D.

Assistant Professors: Rev. J. F. Callaghan, C.S.B., M.A.
W. J. Gillen, M.A.
J. C. Strick, Ph.D.
P. R. Burrell, M.A.

Lecturer: R. N. Kolinski, M.A.

*On leave of absence.

I. THE MASTER OF ARTS DEGREE

At the graduate level, students will be expected to specialize in Economics. With the consent of the Department, however, a student specializing in Economics may be permitted to take one graduate course in Political Science.

Particular Requirements:

(a) A student may proceed towards the degree by taking four graduate seminars and submitting a major paper **in conjunction with one of the seminars,** or
A student may proceed towards the degree by taking four graduate seminars and submitting a major paper.

(b) An oral examination in Economic Theory (including History of Economic Thought, Micro and Macro economics), and in two other fields chosen from the following: Economic History, Money and Banking, Labour Economics, International Economics, Public Finance, Econometrics, Mathematical Economics, the Soviet-type Economics, Economic Development, Industrial Organization.

(c) The candidate must have a reading knowledge of at least one language other than English, or must have knowledge of 2 courses in mathematics beyond the level of Mathematics 13.

II. DETAILS OF SUBJECTS

501. Seminar in Economic Theory: First semester, micro theory; second semester, macro theory. Staff in Economics. *(2 hours a week.)*

510. International Economics: The theory of international economic policy; the interrelation between internal and external balance; economic growth and the balance of payments; international economic institutions; international aspects of economic development and anti-cyclical policies. (Prerequisite: Economics 301). *(2 hours a week (seminar).)*

520. Labour Economics: Selected topics concerned with the labour market, industrial relations, and wage determination. (Prerequisite: Economics 336). Professor Kovacs. *(2 hours a week (seminar).)*

530. Economic Concentration: An advanced study of the theory of institutional development of monopoly and monopolistic competition and government regulatory policies. (Prerequisite: Economics 221). Professor Phillips. *(2 hours a week (seminar).)*

540. Econometrics: Selected topics in Econometrics, including the application of statistical inference to studies of demand curves, production and cost functions, input-output relations, macro-economic models. (Prerequisite: Economics 335 and 430). Professor Gillen. *(2 hours a week (half year lectures, half-year seminar).)*

550. Monetary and Fiscal Theories and Policies: An intensive study of selected topics in current monetary theory and policies aimed at control and stabilization, in first semester; and an intensive analysis of fiscal theory and growth and stabilization policies, in second semester. (Prerequisites: Economics 331 and 223). *(2 hours a week (seminar).)*

560. Economic History: Selected topics in economic history. Professor Callaghan. *(2 hours a week (seminar).)*

570. Economic Development: The theory of economic growth; a comparative study of industrialization processes in various countries; policies for economic development; the technique of developmental planning. (Prerequisite: Economics 402). Professor Fallenbuchl. *(2 hours a week (seminar).)*

580. Mathematical Economics: The existence, stability, and efficiency of equilibrium in general models: aggregate static models and general equilibrium; growth models; mathematical economics and empirical research. (Prerequisite: Economics 335). *(2 hours a week.)*

Undergraduate honours courses, which may be assigned at the discretion of the Department Head to form part or all of the requirements for the first year of the two year graduate program, may be found in the General Announcement.

ELECTRICAL ENGINEERING

Professor: P. A. V. Thomas, Ph.D., Head of Department.

Associate Professors: *H. R. Fletcher, M.A.Sc.

Assistant Professors: G. V. Venkatesulu, M.S.E.E.
O. P. Malik, Ph.D.
A. H. Qureshi, Ph.D.

Lecturer: J. J. M. Huschilt, M.A.Sc.

*On leave of absence.

For requirements for the degree of Doctor of Philosophy in Applied Science, the General Regulations of the Faculty of Graduate Studies should be consulted (p. G-11). For requirements for the degree of Master of Applied Science consult p. G-16.

DETAILS OF SUBJECT

E.E. 500c. Special Topics: Selected advanced topics especially directed in the fields of research in the department. Consent of the instructor required.

E.E. 510c. Graduate Seminar: All graduate students will attend the seminar.

E.E. 521c. Network Analysis: Network topology and fundamental theorems. Matrix formulation. Representation of network functions. Transform techniques and transient analysis. Two-port networks. Filter theory. Signal-flow graphs. *(3 hours a week, one semester.)*

E.E. 522c. Network Synthesis: Energy functions and the positive-real function criterion. Synthesis of driving point impedance of two- and three-element (R, L, C) networks and applications. Topics in four terminal network synthesis and applications. The approximation techniques. *(3 hours a week, one semester.)*

E.E. 531c. Theory of Electromagnetic Fields: Laplace's and Poisson's equations and conformal mapping. Maxwell's equations, scalar and vector potentials. Circuit concepts from field equations. Electromagnetic waves. Mode theory of cylindrical guides and resonators. Radiation and antennas. *(3 hours a week, one semester.)*

E.E. 532c. Advanced Electromagnetic Field Theory: Electromagnetic potentials. Green's function. Boundary value problems. Field equivalence concepts. Spherical and cylindrical wave functions, vector wave functions. Diffraction. (Prerequisite: E.E. 531c or equivalent). *(3 hours a week, one semester.)*

E.E. 541c. Advanced Control Systems: Compensation of linear systems. Principles of statistical design. Sampled data systems. Linear time-varying systems. Nonlinear techniques. *(3 hours a week, one semester.)*

E.E. 551c. Principles of Electronic Computers: Logical design of Digital Computers. Special Computers. *(3 hours a week, one semester.)*

E.E. 552c. Introduction to Computer Languages: Basic machine languages. Introduction to Symbolic languages. Interpreter and compiler programming systems. *(3 hours a week, one semester.)*

E.E. 561c. Advanced Theory of Machines: General theory of Rotating machines. General equations of induced voltage and torque. Transient performance of machines. *(3 hours a week, one semester.)*

E.E. 562c. Advanced Power System Analysis: Fundamental concepts. Torque angle characteristics. Multi-machine problems. Stability limits. Economic dispatch, impulse levels, exciter and voltage regular response, system design. *(3 hours a week, one semester.)*

E.E. 564c. Tensor Analysis of Electric Circuits and Machines: The application of dyadics, matrices and tensors to the theory of electric circuits and machines. *(3 hours a week, one semester.)*

E.E. 566c. High Voltage Technology: Ions and electrons in fields, dielectrics and insulators. Inductance and capacitance of different systems, overvoltages. Lightning and switching surges. Arcing grounds. Corona effects. Protective devices. Travelling waves. High Voltage measurements. Special topics relating to Extra High Voltage, A.C. and D.C. *(3 hours a week, one semester.)*

E.E. 571c. Solid-State Physical Electronics: Introduction to quantum and statistical mechanics. Band structure. Conductivity, mobility and lifetime of carriers. Magnetic properties of solids. Magnetic resonance. *(3 hours a week, one semester.)*

E.E. 572c. Solid-State Applied Electronics: Semiconductor physics. Transistor construction and characteristics. Transistor applications. Ferrites. Tunnel diodes. *(3 hours a week, one semester.)*

E.E. 573c. Linear Active Circuit Design: Four pole and three pole analysis of active circuits. Matrix methods. Feedback theory applied to the design of amplifiers and oscillators. *(3 hours a week, one semester.)*

E.E. 574c. Nonlinear Active Circuit Design: Selected topics in design of nonlinear oscillators and switching circuits. *(3 hours a week, one semester.)*

E.E. 581c. Communication Principles: Basic information theory and encoding. Application in behavioural sciences, business systems and linguistics. *(3 hours a week, one semester.)*

E.E. 582c. Statistical Theory of Communications: Generalized harmonic analysis. Random variables. Noise. Linear and non-linear devices with signal and noise input. Statistical detection of signals. Optimum linear systems. *(3 hours a week, one semester.)*

E.E. 583c. Introduction to Information Theory: Information and information measure. Encoding. Continuous channel with and without memory. *(3 hours a week, one semester.)*

E.E. 591c. Principles and Techniques of Microwave: Microwave principles. Power generation and measurement. Impedence concepts. Representation of microwave circuits. Resonant-cavity, attenuation. Spectrum analysis, microwave measurements. *(3 hours a week, one semester.)*

E.E. 592c. Microwave Electronics: Transit time effects. Interaction of electromagnetic fields and electron streams. Space-charge wave. Velocity modulation tubes, crossed field tubes. Harmonic generation. Amplification. *(3 hours a week, one semester.)*

E.E. 600c. Special Topics: Selected advanced topics especially directed in the fields of research in the department. Consent of the instructor required.

E.E. 621a,b. Advanced Network Theory: Selected topics in modern network theory. *(2 hours a week.)*

E.E. 641a,b. Modern Control Theory: Selected topics in State-Space methods. Variational Calculus, maximum principle and dynamic programming. *(2 hours a week.)*

E.E. 651a,b. Computer Design: Selected topics in the design of computing systems. *(2 hours a week.)*

E.E. 652a,b. Advanced Computer Languages: Selected topics in computer languages and programming systems. *(2 hours a week.)*

E.E. 681a,b. Seminar in Finite Automata: Selected topics in Turing machine, finite-state machines and automata. *(2 hours a week.)*

E.E. 682a,b. Advanced Communication Theory: Selected topics in information theory and statistical communication. *(2 hours a week.)*

ENGINEERING MATERIALS

Professors: R. G. Billinghurst, M.A.Sc., Head of the Department.
J. G. Parr, Ph.D., Dean of the Faculty of Applied Science.

Associate Professor: W. V. Youdelis, Ph.D.

For requirements for the degree of Doctor of Philosophy in Applied Science, the General Regulations of the Faculty of Graduate Studies should be consulted (p. G-11). For requirements for the degree of Master of Applied Science consult p. G-16.

Course requirements for the Ph.D. and M.A.Sc. degrees in Engineering Materials will be selected from the courses listed below and related courses in other departments by consultation between the student and his research advisor.

DETAILS OF SUBJECTS

E.M. 500. Seminar: Required of all graduate students.

E.M. 501. Advanced Crystallography: Application of X-ray diffraction principles to the study of materials, application of Fourier series, single crystal techniques, studies of preferred orientation, imperfections. *(2 hours a week.)*

E.M. 502. Transformations in Metals: Nucleation theory. Theory of rate processes. Applications to diffusion, diffusionless phase changes, eutectoid decomposition, recrystallization, precipitation. Effects of radiation on metals. *(2 hours a week.)*

E.M. 503. Recent Advances in Physical Metallurgy: Review of current metallurgical literature. Discussions on current research in this field. *(2 hours a week.)*

E.M. 504. Irreversible Thermodynamics of Physical Metallurgical Processes: Onsager's reciprocal relations, principle of microscopic reversibility, fluxes and forces, stationary states of various orders, principle of minimum rate of entropy production, specific problem of dendritic crystallization and segregation in alloys will be analysed utilizing irreversible thermodynamic principles. *(2 hours a week.)*

ENGLISH

Professors: Rev. C. P. Crowley, C.S.B., Ph.D.
*John F. Sullivan, Ph.D.
Roderick Huang, Ph.D.

Associate Professors: Eugene J. McNamara, Ph.D.
E. D. LeMire, Ph.D.
Raymond Smith, Ph.D., Acting Head.
Joyce C. Smith, M.A.

Assistant Professors: Lois K. Smedick, Ph.D.
Douglas M. Schwegel, Ph.D.
Philip W. London, Ph.D.
Kathleen O'Donnell, Ph.D.
John M. Ditsky, Ph.D.

*On leave.

I. THE MASTER OF ARTS DEGREE

Particular requirements:

(i) At least two and not more than three graduate courses, one of which may be in a cognate field, plus a thesis;

Or: (ii) Three graduate courses, one of which must be a seminar course including a major paper upon which there shall be an oral examination or an open seminar.

Or: (iii) Candidates for a Master of Arts in English and Creative Writing must take three courses from the regular academic graduate offerings as well as English 595 and complete an original major creative project that in the opinion of the department is of sufficient merit for the awarding of the degree: a novel, collection of poems or short stories, a play.

Language Requirement: Reading knowledge of either French or German is required. A classical language or another modern language may be substituted, with the approval of the Head of the Department, when it has relevance to the student's field of specialization.

Methodology: Knowledge of the methods and tools of scholarship in English is required. A student who has not had English 499a, Scholarship and Bibliography, or its equivalent, may be required to take this course.

II. DETAILS OF SUBJECTS

Graduate courses in English are studies courses, not surveys. For this reason, the corresponding undergraduate survey course, or its equivalent, is always a prerequisite for any graduate course. Furthermore, the specific topics of individual courses will vary from year to year, depending upon the interests and needs of professors and students. It is thus impossible to list in detail the many topics that may from time to time be offered. The schedule below, therefore, lists only the major periods or forms of literature in which special topics will be offered. These special topics courses can be taken several times providing the course content is different. Before beginning an academic year, the Department of English will furnish information as to specific topics of the courses to be offered in that year.

Course Numbers	General Areas
500.	Tutorials
502.	University Teaching of English
505.	The English Language and Linguistics
510.	Literature of the Old English Period
520.	Literature of the Middle English Period
530.	Literature of the Renaissance
540.	Literature of the Neo-Classical Period
550.	Literature of the Romantic Period
560.	Literature of the Victorian Period
570.	Literature of the Modern Period
580.	Literature of the United States
585.	Literature of Canada
590.	Literary Genres: Drama, Criticism, Fiction
595.	Creative Writing Seminar

GEOGRAPHY

Professor: J. C. Ransome, Ph.D., Head of Department.

Assistant Professors: P. E. Vandall, M.A.
Mrs. Marie Sanderson, Ph.D.
A. Blackbourn, M.A.

MASTER OF ARTS DEGREE

The general admission, residence, and period of study requirements may be found in the Regulations of the Faculty of Graduate Studies.

Students entering at the graduate level in the Department of Geography will be assigned to an advisory committee and examined briefly to determine (1) special research interests, and (2) needs for supplementary readings.

Particular Requirements:

The course of study for the Master of Arts in Geography will require:

(1) Satisfactory completion of at least two graduate credit courses in geography, plus one additional course which may be taken in geography or in a cognate field. An undergraduate course may be taken as the third course requirement upon approval of the major advisor.

(2) A thesis on a subject approved by the advisory committee, and accepted upon the conclusion of the writing and an oral examination upon the thesis.

(3) Reading ability in one language other than English. The Department of Geography will make arrangements with the Department of Modern Languages for graduate examinations. The language requirement must be completed at least six months before completion of the thesis.

DETAILS OF SUBJECTS

Not all courses listed will necessarily be offered in any one year.

501. Research and the Philosophy of Geography: Seminar in the conceptual approaches of geography, nature of the region, and research techniques.

502. Selected Problems in Applied Geography: A consideration of the functions of applied geography, the application of maps and other tools, and discussion of individual graduate research papers.

503. Research in Regional Geography: Readings and discussions in selected regional topics.

504. Advanced Research in Climatology: Seminar – series of graduate research projects, exploratory both in methodology and area.

505. Advanced Research in Urban Geography and Planning: Seminar – projects selected to contribute to the solution of local and regional planning problems.

HISTORY

Professors: *Rev. D. J. Mulvihill, C.S.B., Ph.D., Department Head.
Rev. F. J. Boland, C.S.B., Ph.D.
Rev. J. P. O'Meara, C.S.B., Ph.D.
F. A. Walker, Ph.D.

Associate Professors: M. N. Vuckovic, Ph.D. (Acting Head).
J. K. A. Farrell, Ph.D.
K. G. Pryke, Ph.D.
Brother Bonaventure Miner, F.S.C., Ph.D.

Assistant Professors: A. I. Mouratides, Ph.D.
S. S. Walker, Ph.D.
Rev. H. G. Hill, M.A., O.G.S.

THE MASTER OF ARTS DEGREE

Particular Requirements:

I. *Either:* (i) At least two and not more than three graduate courses, one of which may be in a cognate field, plus a thesis;
Or: (ii) Three graduate courses, one of which must be a seminar course including a major paper upon which there shall be an oral examination.

II. All candidates for M.A. degree are required to take History 510, and to write the prescribed examinations.

History 510 is conducted in five parts, as follows:
(i) Historical Method and the Philosophy of History.
(ii) Historiography of Ancient and Medieval Europe.
(iii) Historiography of Western Europe from the 16th to the 19th century.
(iv) Historiography of North America.
(v) Slavonic Historiography.

Candidates will take Parts (i) and (ii) together with such other two parts as may be determined in consultation with the Department.

Language Requirement:

The candidate must have a reading knowledge of at least one language other than English. The language shall be chosen in consultation with the Head of the Department. Written language examinations are set twice a year in conjunction with the Department of Modern Languages of the University.

III. DETAILS OF SUBJECTS

510. Historical Method, Historiography and Philosophy of History.
515. A political, social economic and cultural history of Ontario since 1763. A seminar and select reading course.
520. History of Canada, 1867-1945.
525. Canadian-American Relations 1785 to present.
530. British Political and Social Thought from 1832-1914. A seminar and selected reading course.
535. Modern British Commonwealth of Nations. A seminar and selected reading course, with particular emphasis on the relations among the member countries.
540. American Political and Social Thought from 1820 to 1930. A seminar and selected reading course.
550. Intellectual History of Russia. The Byzantine tradition; development and influences of Russian thought from 1801 to 1956. A seminar and selected reading course.
555. International Relations and World Problems in the 20th Century. A seminar and selected reading course.
560. Political and Social Development in Western Europe, 1789-1914. A seminar and selected reading course.
565. History of Socialist Thought in Western Europe in the 19th Century. A lecture and seminar course.

In special cases, seminars in other areas may be required and will be given by the members of the Department.

Undergraduate honours courses, which may be assigned at the discretion of the Department Head to form part or all of the requirements of the first year of the two year graduate program, may be found in the General Announcement.

*On leave of absence.

MATHEMATICS

Professors: Rev. D. T. Faught, C.S.B., M.A., Head of Department.
H. A. Eliopoulos, M.Sc., Ph.D.
E. Zakon, Dr. Jur.
F. Rothberger, Ph.D.

Associate Professors: A. C. Smith, M.Sc., Ph.D.
D. S. Tracy, M.C., Sc.D.
K. A. Zischka, M.A., D.Sc.

Assistant Professors: H. R. Atkinson, M.Sc., Ph.D.
S. P. Singh, M.Sc., Ph.D.

I. THE DEGREE OF DOCTOR OF PHILOSOPHY

For admission requirements, and period of study, the General Regulations of the Faculty of Graduate Studies should be consulted.

1. Course Work:

Candidates must complete successfully at least six graduate courses of which up to four may be transfer credits; further graduate courses are left to the discretion of the adviser and the Department Head.

2. Doctoral Committee:

Each student will be assigned to an advisory committee during his first year of study. The student's adviser will be the chairman of this committee. There will be at least two additional members of the Department of Mathematics on the committee. Further members from within or without the University may be added if this is desirable. The adviser will advise the candidate in his choice of courses. The committee will review his progress from time to time, examine his dissertation, and take part in his final oral examination.

3. Dissertation:

The principal requirement for the Ph.D. degree is the presentation of a dissertation which embodies the results of an original investigation in some branch of mathematics. The results so presented should constitute a significant and original contribution to knowledge which merits reporting in some scholarly publication.

The subject of the dissertation must be approved by the student's Doctoral committee at least one year before graduation. Minor modifications of the subject may be made at a later date.

4. Examinations:

In addition to foreign language examinations and examinations in courses the student must pass a comprehensive qualifying examination and a final oral examination. The comprehensive examination will be set by the Department of Mathematics and will test the student's mastery of several important branches of mathematics.

The examination will be written and may be supplemented by an oral examination. The examination will normally be taken one year after the commencement of graduate studies and will admit the student to the candidacy for the doctoral degree. The examination must be passed at least one year before graduation.

Each candidate will, when recommended by his advisory committee, present himself for a final oral examination in defence of his dissertation. This examination will be conducted by a committee which, in addition to the members of the candidate's advisory committee and an external examiner, may include faculty members from other departments. The chairman and extra departmental members are appointed by the Dean of Graduate Studies in consultation with the Head of the Department.

5. **Language Requirements:**

A candidate will be expected to demonstrate by written examination a reading knowledge of two of French, German or Russian.

II. THE DEGREE OF MASTER OF SCIENCE

The course of study shall be either at least four graduate courses, or at least three graduate courses, and a major paper upon which there shall be an oral examination.

Language Requirements:

A candidate will be expected to demonstrate by written examination a reading knowledge of one of French, German or Russian.

III. DETAILS OF SUBJECTS

501—Advanced Modern Algebra.

504—Mathematical Logic.

505—Advanced Geometry.

506—Topics in Differential Geometry and Differential Topology.

507—Functions of a Real Variable.

509—Integral Transforms.

511—Fourier Analysis.

514—General Topology.

515—Algebraic Topology.

516—Topics in Algebra.

517—Topics in Analysis.

518—Topics in Complex Analysis.

540—Partial Differential Equations.

541—Numerical Solutions of Ordinary and Partial Differential Equations.

542—Nonlinear Ordinary Differential Equations.

543—Nonlinear Partial Differential Equations.

544—Numerical Analysis.

545—Functional Analysis.

546—Numerical and Functional Analysis.

550—Advanced Quantum Mechanics and Quantum Field Theory.

551—Group Theory and Quantum Mechanics.

552—Topics in Relativity and Field Theory.

553—Aerodynamics.

554—Hydrodynamics.

555—Elasticity.

556—Fundamentals of Continuum Mechanics.

557—Gas and Plasma Kinetics.

580—Advanced Mathematical Statistics.
581—Multivariate Analysis.
582—Design of Experiments and Sampling Theory.
583—Probability and Stochastic Processes.
584—Topics in Statistics.
590—Linear Models.
591—Theory of Estimation.
592—Decision Theory.
593—Baysian Statistics.
594—Non-parametric Statistics.

MECHANICAL ENGINEERING

Professor: W. G. Colborne, M.Sc., Head of Department.

Associate Professors: H. J. Tucker, M.Eng.
A. A. Nicol, Ph.D.
K. Sridhar, Ph.D.
W. P. T. North, Ph.D.

For requirements for the degree of Doctor of Philosophy in Applied Science, the General Regulations of the Faculty of Graduate Studies should be consulted (p. G-11). For requirements for the degree of Master of Applied Science consult p. G-16.

DETAILS OF SUBJECT

With the permission of the chief advisor and the Department Head, certain M.E. 400 courses related to the graduate field of study may be taken for graduate credit, provided that a minimum of two courses at the 500 level be taken.

I. MECHANICAL ENGINEERING:

M.E. 501c. Compressible Flow: Review of flow equations, steady one-dimensional isentropic flow, adiabatic flow with friction, and flow with heat transfer; normal shocks, nozzle flows with shocks, nozzle with long ducts; unsteady one-dimensional flow, method of characteristics, shock tube, waves in two-dimensional flow; imperfect gas effects; boundary layers. *(3 hours a week, one semester.)*

M.E. 502c. Theory of Viscous Fluids: Laminar flow. Navier-Stokes equations with exact and approximate solutions, approximate solution of the boundary layer by momentum theorem. *(3 hours a week, one semester.)*

M.E. 503c. Theory of Viscous Fluids: Turbulent flow. General theories, wall turbulence, free turbulence. *(3 hours a week, one semester.)*

M.E. 504c. Heat Transfer: Conduction, heat conduction equations, analytical solutions of the conduction equations, numerical and graphical solutions. *(3 hours a week, one semester.)*

M.E. 505c. Heat Transfer: Convection, the energy equation, laminar heat transfer, turbulent heat transfer and analogies between heat and momentum transfer, forced and free convection, boiling heat transfer. *(3 hours a week, one semester.)*

M.E. 506c. Heat Transfer: Radiation, radiation through non-absorbing medium, gas and flame radiation, solar radiation collectors, radiation from fins and tubes. *(3 hours a week, one semester.)*

M.E. 507c. Experimental Techniques in Flow Measurements: A course covering the theory of flow and velocity measurement. Emphasis will be placed on hot wire instruments and turbulence measurements. *(3 hours a week, one semester.)*

M.E. 509. Mechanical Vibrations: Harmonic vibrations in systems with one degree of freedom, non-harmonic vibrations in systems with one degree of freedom, systems with several degrees of freedom. *(2 hours a week, all year.)*

M.E. 510c. Statistical Thermodynamics: Kinetic theory distribution of molecular velocities, transport phenomena, Maxwell-Boltzmann statistics, quantum statistics, partition functions and thermodynamic properties, gases and vapours, compressed gases and liquids, irreversible processes. *(3 hours a week, one semester.)*

M.E. 511c. Advanced Strength of Materials: Plates, unsymmetrical bending, energy methods, theories of failure, torsion of noncircular sections. *(3 hours a week, one semester.)*

M.E. 512c. Directed Special Studies: A special course of studies with content and direction looked after by the Professor directing the thesis project. There may not be formal lectures, however, the course will carry the weight of three hours lectures for one semester.

M.E. 513. Experimental Stress Analysis: An introduction to stress strain determinations, considering brittle castings, strain gages, photoelasticity, grid methods. Experimental application and interpretation of static and dynamic electrical strain gage methods, photoelastic techniques and other. *(2 hours a week, 3 laboratory hours alternate weeks.)*

II. INDUSTRIAL ENGINEERING:

I.E. 501c. Industrial Experimentation: Design of experiments used in Industrial Engineering, estimation and tests of hypothesis, power of tests, non-parametric tests, sampling techniques, analysis of variance, randomized blocks, Latin squares and factorial experiments. *(3 hours lectures, one semester.)*

I.E. 502c. Simulation Principles and Techniques: Various types of simulation and techniques of simulation. Use of digital computers for simulation of Industrial processes. Study of applications in problems of inventory, job shop scheduling, etc. *(3 hours lectures, one semester.)*

I.E. 503c. Inventory Control: The use of mathematical models of inventory and production systems. Analytical structure of inventory problems under risk and uncertainty. Design of decision procedures for inventory control systems. *(2 hours lectures, one semester.)*

I.E. 504c. Linear Programming: Theory of computational techniques for solving constrained optimization problems. Theoretical foundation of simplex algorithm. Transportation and assignment algorithms. Duality, integer programming, game theory. Applications to industrial problems. *(2 hours lectures, one semester.)*

I.E. 505c. Queuing Theory: Single channel and multichannel queuing problems. Poisson arrival and negative exponential service times. Mathematical approach and simulated (Monte Carlo) approach for solving problems. Typical applications of queuing theory. *(2 hours lectures, one semester.)*

MODERN LANGUAGES

Professors: Rev. C. J. Drouillard, C.S.B., Ph.D., Head of the Department.
Lillian McCarthy, Ph.D.

Associate Professor: G. Fournier, D.es L.

Assistant Professors: W. Skakoon, M.A.
B. D. Kingstone, Ph.D.
Sr. Marie T. Caron, Ph.D.
T. Llanos, Licenciado
D. Horn, Ph.D.
V. Perez-Soler, Ph.D.
Y. Fournier, Ph.D.

I. THE MASTER OF ARTS DEGREE IN ROMANCE LANGUAGES

Particular Requirements:

In addition to the general requirements and stipulations listed on pages G-16 ff. for the Master's degree, the following course requirements must be met by all candidates: the successful completion of four full graduate courses in either French or Spanish or both. Not all of the courses listed will necessarily be offered in any one year.

II. DETAILS OF SUBJECTS

510. Romance Philology.

511. The Beginning of the Romance Literatures — a paleongraphic-linguistic study of the earliest monuments of the Romance literatures.

514. History of the French Language from its origins to François Villon.

517. The critical edition of medieval manuscripts (literary and non-literary texts).

540. Rabelais and the Prose writers of the 16th Century.

550. Molière.

552. Corneille.

553. Racine.

555. French Thought in 16th and 17th Centuries.

558. The Novel in 17th Century France.

559. Pascal.

560. The Theatre of Marivaux.

562. Les Encyclopedistes.

570. French Poetry from 1870-1914.

580. André Gide.

581. Sartre.

582. Revolte contre le Romantisme, le dadaisme, l'exploration de l'inconscient.

520. Old French Texts.

590. The theme of "Don Juan" and the philosophy of free personal behaviour, prize and punishment in the Spanish Theatre.

591. Spain as a problem in the literary generation of 1898.

592. The "modernist movement" and the post modernist era in Spanish American literature.

593. Spanish American literature; style, theme and genre since the independence.

Undergraduate honours courses, which may be assigned at the discretion of the Department Head to form part or all of the requirements of the first year of the two year graduate program, may be found in the General Announcement.

PHILOSOPHY

Professors: John N. Deck, Ph.D.
Rev. Frederick Temple Kingston, D.Phil.

Associate Professors: Patrick Francis Flood, M.A.
S. B. Cunningham, M.S.L., Ph.D., Acting Head.
Rev. Leonard A. Kennedy, Ph.D.
Donald B. Kuspit, Ph.D.

Assistant Professor: *John U. Lewis, Ph.D.

*On leave.

I. THE MASTER OF ARTS DEGREE

A. General Nature of Graduate Courses:

The purpose of the course work for the Master's degree is to allow the candidate to develop professional competence in the field by directing his efforts toward research in specific problems in philosophy. Consistent with this aim, every effort will be made to conduct courses on a seminar basis. It is presumed that the candidate's undergraduate academic background will enable him to participate satisfactorily in a course of this nature.

B. Particular Requirements:

In addition to the general requirements listed on p. G-16 ff. of the Graduate Calendar for the Master's degree, the candidate shall: (1) Successfully complete three full courses, one of which may be selected from a cognate field; (2) Complete a directed research paper (in conjunction with one of the philosophy course) upon which there shall be an oral examination.

C. Language Requirements:

The Master's candidate must successfully pass an examination to test reading knowledge in one language other than English. The language will be selected in consultation with the department head and the student's research director.

II. DETAILS OF SUBJECTS:

(Not all the courses listed will be offered in any one year).

500. Plato.

501. Aristotle.

502. Hellenistic Philosophy.

503. Logic: Ancient and Mediaeval: Selections from the Organon of Aristotle; the propositional logic of the Stoics; the contributions to the logic of Boethius, Abelard and the logicians of the fourteenth century, especially William of Ockham.

510. The Philosophy of Being and Knowledge in the Middle Ages: Particular emphasis will be placed on the work of Augustine, Thomas Aquinas, Bonaventure, Duns Scotus and William of Ockham.

511. Moral and Political Speculation in the Middle Ages: Contributions to moral and political thought by Augustine, Albert the Great, Thomas Aquinas, Duns Scotus and William of Ockham.

512. Renaissance Philosophy: Italian humanism and early scientific thought.

520. Descartes, Spinoza, and Leibniz.

521. Locke, Berkeley and Hume.

522. Bacon and Hobbes.

523. Moral Philosophy: 17th and 18th Centuries: The British and continental moralists, up to and including Kant.

524. Kant.

525. Fichte, Schelling and Hegel.

526. Marx and Marxism.

530. Origins of Existentialism: Pascal, Kierkegaard and Nietzsche.

531. French Phenomenological Existentialism: Sartre, Marcel and Merleau-Ponty.

532. German Phenomenology: Husserl and Heidegger.

533. Contemporary Ethical Theories.

534. British Philosophy: 1900-1938.

535. Recent British Philosophy.

536. American Philosophy: Pierce, James, Dewey.

537. Process Philosophers: Bergson, Whitehead, Teilhard de Chardin.

540. Philosophical Psychology.

541. Metaphysics.

542. Social and Political Philosophy.

543. The Philosophy of History.

544. The Philosophy of Religion.

545. Aesthetics.

546. Advanced Symbolic Logic. (This course is also given as Mathematics 504 — Mathematical Logic).

547. Problems in the Philosophy of Science.

555. Problems in Modern French Philosophy. (This course is also given by the Department of Modern Languages as **French Thought in 16th and 17th Centuries.**

PHYSICS

Professors: Lucjan Krause, B.Sc., M.A., Ph.D., F. Inst. P., Head of the Department.
Geza Szamosi, Ph.D., D.Sc.

Visiting Professor: Vachaspati, M.Sc., Ph.D.

Associate Professors: John Huschilt, M.A., Ph.D.
Edwin E. Habib, B.Sc., Ph.D.
Nigel E. Hedgecock, M.A., Ph.D.
Frank Holuj, M.Sc., Ph.D.
Arie van Wijngaarden, B.Sc., Ph.D.
David Robinson, M.Sc., Ph.D.
Leopold E. Halpern, D.Phil.

Assistant Professors: Mieczyslaw Czajkowski, D.Sc.
Hisashi Ogata, M.Sc., Ph.D.

Postdoctorate Fellows and Research Associates:
B. M. Barker, M.S., Ph.D.
W. Berdowski, D.Sc.
M. S. Bhatia, M.Sc., Ph.D.
S. Bonazzola, D.Sc.
B. P. Kibble, M.A., D.Phil.
A. Kossakowski, D.Sc.
M. D. Lombardero, B.Sc., Ph.D.
H. Lozykowski, D.Sc.
D. Zivanovic, D.Sc.

The Department provides facilities for students wishing to proceed to the degrees of Master of Science and Doctor of Philosophy. The attention of candidates is drawn to the regulations on page G-16 governing admission requirements and the requirements for the M.Sc. degree. The candidates must also satisfy the following additional conditions.

Admission Requirements:

The basic qualification for admission consists of a Bachelor's degree with adequate specialization in Physics, obtained with first or second class honours. Students with deficiencies may be permitted to make up these deficiencies by registering initially in a program of undergraduate courses.

I. THE DEGREE OF DOCTOR OF PHILOSOPHY

1. **Period of Study:**

A minimum of three years in full-time graduate studies is required. Credit for one of the three years may be given for a Master's degree obtained in this department or for graduate work carried out at another institution. Not more than seven years should elapse between registration and completion of the requirements for the degree; an extension of this period may be granted only on recommendation from the department.

2. **Course Work:**

Candidates will complete a minimum of five graduate courses, of which Physics 500a and b, 555 and 631 are obligatory. Certain courses in mathematics or another science may be accepted for graduate credit if approved by the Department. All candidates are expected to participate in departmental seminars. Candidates may be permitted by the Department to include in their program one undergraduate course.

3. **Doctoral Committee:**

Within one month after registration each candidate will be assigned to an advisory committee consisting of his research advisor and two other staff members in the Department. The committee will, from time to time, review the candidate's progress and will be present at the final oral examination (defence of the dissertation). The committee may co-opt an additional member from outside of the University who, as expert in the field of physics in which the candidate's research is carried out, will appraise his dissertation and may also be present at the final oral examination.

4. **Dissertation:**

In order to qualify for the degree, each candidate must present a dissertation embodying the results of an original investigation in a branch of physics. Graduate courses form an important but subsidiary part of the program.

The candidate, when requested, shall submit to his chief advisor from time to time portions of his dissertation and a complete draft on a date specified by his advisor and place four typewritten copies of the completed dissertation in the hands of his advisor at least six weeks before convocation. The members of the candidate's committee must sign the dissertation, when approved, on a page immediately following the title page. The candidate shall submit with his dissertation four copies of an abstract of not more than 500 words and four copies of a vita. The abstract will be bound with the dissertation immediately following the certificate of approval and the vita at the end of the dissertation. An additional abstract is required for national bibliographical purposes. The candidate should consult the University Librarian as to the format of the dissertation. Rules governing binding, quality of paper, etc., of the dissertation can be found on page G-13.

5. **Examinations:**

In addition to the examinations in the courses, all candidates must pass qualifying examinations covering the general field of physics at the level of the honours course given in this department. Two three-hour papers are written, usually one year after the commencement of graduate studies. The examinations take place in the Spring and in the Fall and must be passed at least one year before the date of expected graduation. Other examinations (written or oral) may be set at the discretion of the department.

Each candidate will, on recommendation of his advisory committee, present himself for a final oral examination in defence of his dissertation. This examination will be conducted by a committee which, in addition to the members of the candidate's advisory committee and the external examiner, may include faculty members from other departments. The chairman and extradepartmental members are appointed by the Dean of Graduate Studies in consultation with the Head of the Department.

II. THE DEGREE OF MASTER OF SCIENCE

Particular Requirements:

The degree of Master of Science may be obtained by pursuing a program of studies consisting of **either** not less than four and not more than five graduate courses **or** at least two and not more than three graduate courses, and a thesis.

Physics 500 a or b and 555 will be required to all candidates. Candidates proceeding to the M.Sc. by either of the above options may include in their programs, with the approval of the Department, one undergraduate course. Candidates who are proceeding to the M.Sc. by course work alone may be permitted to include in their programs two courses in mathematics.

III. DETAILS OF SUBJECTS

Not all of the courses listed below will necessarily be offered in any one year.

500a. Seminar: Selected topics in Theoretical Physics *(half course).*

500b. Seminar: Selected topics in Theoretical Physics *(half course).*

526. Molecular Spectroscopy: Structure of diatomic molecules; the rotational, vibrational and electronic states and associated band spectra. Raman spectra, vibrational and rotational spectra of polyatomic molecules. Zeeman and Stark effects in molecules and hyperfine structure.

534. Advanced Electronics: Transmission line theory, microwaves, pulse and digital circuits. Network analysis with Fourier and Laplace transforms.

535. Theory of Semiconductors and Semiconductor Devices: Quantum theory of semiconductors. Dynamics of electrons in static and high frequency electric and magnetic fields. Equilibrium statistics, transport theory, diffusion, drift and thermoelectric effects. Characteristics of p-n junctions, heterojunctions and transistor devices.

552. Atomic Physics and Resonance Phenomena: Interactions between magnetic fields and atomic energy levels with special reference to electron-spin resonance and optical pumping phenomena.

555. Quantum Mechanics: General principles of quantum mechanics. Representation of wave equations. Dirac equation. Number representation and the second quantization. Many body problems and identical particles. Scattering theory and the S-matrix. Quasi-particles.

566. Solid State Physics: The study of point groups, Brevais lattices and space groups. Inverse lattices with applications to scattering phenomena. Electric, magnetic and thermal properties of solids; superconductivity and superfluidity. The effects of imperfections and impurities in crystals.

567. Nuclear Physics: Nuclear forces. Group theoretical treatment of angular momentum. Nuclear structure: the shell model, the collective model, the Nilsson model, the quasi-particle model. Nuclear decays and angular correlations. Nuclear reactions: resonance theory, the compound nucleus, direct reactions, the optical model.

577. Theory of Relativity: Lorentz covariant hydrodynamics, thermodynamics and electrodynamics of moving bodies, applications. The principle of equivalence, Riemann space-time, Einstein field equations, crucial experiments, applications to cosmology. (Prerequisite: Physics 450).

626. Molecular Physics: Crystal field theory in the weak and strong coupling schemes. Molecular orbitals; vibrionic interactions. Electronic structure and spectra of molecular complexes; paramagnetism of molecular complexes; paramagnetic and nuclear magnetic resonance. (Prerequisite: Physics 555).

631. Statistical Physics: The many body problem in quantum mechanics, particle number representation. Statistical (density) matrix. The perfect gas, real gases, dense plasma, applications. Theory of macroscopic quantum phenomena. (Prerequisite: Physics 555).

655. Classical and Quantum Field Theory: Variational principles and conservation laws, applications, field equations and their solutions. Quantization of fields, scalar, vector and spinor fields. Quantum electrodynamics and its applications, renormalization, radiation corrections. (Prerequisite: Physics 555).

666. Quantum Theory of Elementary Particles: Basic properties of classical and quantum fields. Electromagnetic, weak and strong interactions. Isotopic spin. Beta decay, nuclear forces, strange particles and their connections. (Prerequisite: Physics 555).

AREAS OF RESEARCH:

Candidates proceeding to the degrees of M.Sc. and Ph.D. may carry out research in the following fields:

Problems in atomic physics and atomic collisions (L. Krause); Beta- and gamma-ray spectroscopy (E. E. Habib); Electron spin resonance in solids (F. Holuj and N. Hedgecock); Interaction of low energy ions with matter and mass spectroscopy (A. van Wijngaarden); Plasma physics and diagnostics (D. Robinson); Theoretical plasma physics, theory of relativity (G. Szamosi and J. Huschilt); Theoretical nuclear physics (H. Ogata); Theory of gravitation (L. Halpern).

POLITICAL SCIENCE

Professor: V. C. Chrypinski, Ph.D.

Associate Professors: W. L. White, Ph.D., Head of Department.
R. C. Nelson, Ph.D.

Assistant Professors: E. D. Briggs, Ph.D.
R. H. Wagenberg, Ph.D.

Lecturer: J. C. Strick, Ph.D. (part time).

I. THE MASTER OF ARTS DEGREE

Particular requirements:

(a) A thesis on some research subject approved by the Department.

(b) An Oral Examination in Political Theory (including the History of Political Thought) and two other fields. Each candidate is expected to read for the examination under the direction of his Advisor.

(c) The completion of a minimum of two graduate courses.

(d) The candidate must have a reading knowledge of at least one language other than English.

II. DETAILS OF SUBJECT

501. Seminar in Political Theory: Selected theories which have influenced modern political philosophy. (Prerequisite: Political Science 452). Staff in Political Science. *(2 hours a week.)*

510. Problems in Canadian Government: The development of Canadian autonomy, and its effects on the various institutions of government. (Prerequisite: Political Science 220). Professor White. *(2 hours a week (seminar).)*

515. Seminar in Comparative Government: Selected current issues in national politics of foreign governments. Dr. Chrypinski. *(2 hours a week.)*

520. International Organizations: The history, structure and operation of international political organizations, with emphasis on the League of Nations and the United Nations. (Prerequisite: Political Science 443). Professor Briggs. *(2 hours a week (seminar).)*

530. The Politics of Development: An examination of the processes pertinent to the political development of emergent nations. *(2 hours a week.)*

535. Public Administration: Application of the principles of public administration to selected areas in the Federal Government of Canada. *(2 hours a week (seminar).)*

Undergraduate honours courses, which may be assigned at the discretion of the Department Head to form part or all of the requirements for the first year of the two year graduate program, may be found in the General Announcement.

PSYCHOLOGY

Professors: Rev. R. C. Fehr, C.S.B., Ph.D., Head of Department.
A. A. Smith, Ph.D.
V. B. Cervin, Ph.D.

Associate Professors: Rev. M. A. Record, C.S.B., M.A.
Rev. J. A. Malone, C.S.B., Ph.D.
M. E. Bunt, Ph.D.
O. Worden, Ph.D.

Assistant Professors: M. Starr, M.A.
H. W. Kirby, Ph.D.
B. P. Rourke, Ph.D.
S. A. Kushnick, Ph.D.
D. H. Richardson, M.A.

Lecturers: D. Swaisgood, M.S.W. (Part-time Consulting Social Worker).
W. Yaworsky, M. D. (Part-time Consulting Psychiatrist).

Sessional Instructor: A. Ortiz, M.D.

Professor Emeritus: Brother R. Philip, F.S.C., Ph.D.

I. THE DOCTOR OF PHILOSOPHY DEGREE IN PSYCHOLOGY

1. Course Work

Students must complete successfully at least six graduate courses after the Honours B.A. At least four graduate courses will be taken in the first year of the doctoral program and two courses in the following year. If the student has his Master's Degree in Psychology, at least two graduate courses will be required of him. Up to four courses may be accepted for credit from another university. Further graduate courses are to be left to the discretion of the Advisor and Department Head. Together with the above requirements, the Doctor of Philosophy Degree in the area of Clinical Psychology includes 2000 hours of supervised clinical work. The minimum passing grade in these courses, graduate and undergraduate, is 66%. A student who fails one only of these courses may repeat it once at the discretion of the Department.

2. Doctoral Committee

Each student will be assigned to an advisory committee during the first year of study. The student's advisor will be the chairman of this committee. There will be at least two additional members of the Department of Psychology on the committee. Further members from within or without the University may be added if this is desirable. The advisor will direct the candidate in his choice of courses. The committee will review his progress from time to time, examine his thesis, and take part in his final oral examination.

3. Dissertation

The principal requirement for the Ph.D. degree in Psychology is the presentation of a dissertation which embodies the result of an original investigation. The results so presented should constitute a significant and original contribution to knowledge.

4. **Examinations**

The Graduate Record Examinations will be required for all students seeking admission to the Department of Psychology.

In addition to the foreign language examination and examination in courses the student must pass a comprehensive examination and a final oral examination. The comprehensive examination, set by the Department of Psychology, will test the student's mastery of several important areas of Psychology. The examination will be written and may be supplemented by an oral examination. The examination will normally be taken one year after the commencement of Graduate Studies for the doctoral degree and will admit the student who successfully passes it to the candidacy for the doctoral degree. The examination must be passed at least one year before graduation.

During the course of his research, the Doctoral Candidate will present a Progress Report on his dissertation. The Progress Report will be the equivalent of a departmental oral examination of the candidate's research by the entire department.

Then, each candidate will, when recommended by his advisory committee, present himself for a final oral examination in defense of his dissertation. This examination will be conducted by a committee which, in addition to the members of the candidate's advisory committee, may include at least one external examiner. The chairman and extra-departmental members are appointed by the Dean of Graduate Studies in consultation with the chairman of the Department.

II. THE MASTER OF ARTS DEGREE

Particular Requirements:

(i) The course of study will be at least two and not more than three graduate credit courses, one of which may be in a cognate field, and a thesis.

(ii) Three graduate courses, one of which must be a seminar course including a major paper upon which there shall be an oral examination.

III. DETAILS OF SUBJECTS

The majority of the following courses are seminars.

501. History of Psychology: The origin of experimental psychology and its early development in Europe and America. The development of the main psychological systems. *(2 hours a week, one semester.)*

502. Modern Theories in Psychology: Development of mental measurement and experimental psychology. Theories of the mind and systems of thought including Structuralism, Behaviourism, Gestalt Psychology and Psychoanalysis. (Prerequisite: Psychology 501). *(2 hours a week, one semester.)*

503. Psychoanalysis and Related Fields: The major works of Freud, Jung, Adler, Horney, Sullivan and Fromm. *(2 hours a week.)*

506. Theories of Learning: Discussion of modern approaches to psychology of learning, including mathematical formulation of learning and behavioural processes. *(2 hours a week.)*

507. Symbolic Processes: Discussion of main findings and research in concept formation, problem solving and thinking. *(2 hours a week.)*

508. Advanced Psychology of Learning: Theoretical and experimental analysis of more complex problems of human learning and behaviour. (Prerequisites: Psychology 506 and 507). *(2 hours lectures, 2 hours laboratory a week.)*

511. Mathematical Methods in Psychology: Introduction to set theory, symbolic logic, probability theory, difference equations, matrices, vector spaces, and other selected topics of abstract algebra. *(2 hours a week.)*

512. Advanced Statistics I: Probability distributions, research design, analysis of variance and covariance, non-parametric methods in research. *(2 hours a week.)*

513: Advanced Statistics II: Introduction to multivariate analysis, regression analysis, least squares methods,, factor analysis, discriminant functions etc. (Prerequisites: Psychology 531 and 511). *(2 hours a week.)*

514. Theories of Measurement and Scaling: Introduction to the theory of measurement and psychological scaling, general psychological scaling models, theory of test construction. (Prerequisites: Psychology 531 and 511). *(2 hours a week.)*

521. Perception and Cognition: Theories of perception and cognition; related research and research methodology, psychophysical scaling, perceptual structuring, learning and motivation as related to perception, social and personality perception, concept formation and symbolic processes. *(2 hours a week.)*

522. Emotions and Motivation: A comparative study of the modern theories of emotion and motivation. *(2 hours a week.)*

531. Advanced Experimental Psychology: Vision: Theories of vision, psychophysiology of vision; instrumentation and measurement techniques. *(2 hours lectures, 2 hours laboratory a week.)*

532. Advanced Experimental Psychology: Audition: Theories of audition, psychophysiology of audition, instrumentation and measurement techniques. *(2 hours lectures, 2 hours laboratory a week.)*

533. Special Projects in Experimental Psychology: Individual research in one of the areas of vision, audition, learning, perception, or social experimental psychology. (Prerequisites: One of Psychology 507, 508, 511, 502, 531, or 551). *(2 hours lectures, 4 hours laboratory a week.)*

534. Advanced Experimental Methodology: Experimental logic, techniques, and apparatus, research in psychology. (Prerequisite: 451). *(2 hours a week.)*

541. Physiological Psychology: Structure and function of the nervous and endocrine systems in relation to behaviour. Physiological and neural aspects of motivation, emotions, learning, and symbolic processes. *(2 hours lecture, 2 hours laboratory a week.)*

542. Structure and Function of the Brain: An intense study of brain anatomy including brain dissection. (Prerequisite: Psychology 503). *(2 hours lecture, 4 hours laboratory a week (one semester).)*

548. Comparative Psychology: Behaviour in infra-human organisms with emphasis on vertebrates. Experiments on motivation, innate behaviour, learning, retention, and problem solving. *(2 hours lecture, 2 hours laboratory a week.)*

551. Psychology of Human Interaction: Systematic discussion of principles of verbal and non-verbal human interaction, behaviour controls, attitudes, competition, cooperation, group behaviour, team learning, conflict resolution. Mathematical formulations of social behaviour. *(2 hours a week.)*

552. Experimental Social Psychology: Theoretical and experimental analysis of some problems in social interaction and group behaviour. *(2 hours lectures, 2 hours laboratory a week.)*

553. Contemporary Theories in Social Psychology: Discussion of modern theoretical approaches to social phenomena. *(2 hours a week.)*

561. Psychology of Personality: Critical evaluation of the current theories of personality. Biological and cultural emphasis in personality development and assessment. Personality structure and determinants; dynamics and style of expression. *(2 hours a week.)*

562. Advanced Abnormal Psychology: Criteria of the normal and abnormal. The organic and psychological sources of mental illness with special emphasis on the etiology, symptoms and dynamics of neuroses, psychoses and psychopathies. Experimental studies of abnormality. *(2 hours a week.)*

563. Developmental Psychology: A survey and critical evaluation of original studies on development of normal children from birth through adolescence. Methods of research in developmental psychology, relative influences of maturation and training, learning and motor skills, social, emotional, moral and intellectual development. *(2 hours a week.)*

564. The Psychology of Stress and Anxiety: A critical survey of past and current literature in the area of psychological stress and anxiety drawn from the experimental, social and clinical areas. Emphasis is placed upon the theoretical issues involved, and techniques of measurement. *(2 hours a week.)*

571. Advanced Projective Techniques I (Rorschach): Interpretation of Rorschach, supervised clinical administration. Conducting and attending case conferences. *(2 hours lecture, 2 hours laboratory a week.)*

572. Advanced Projective Techniques II (TAT, DAP, etc.): Administration and interpretation of the Thematic Apperception Test, Draw-A-Person, and selected Sentence Completion Tests. Conducting and attending case conferences. *(2 hours lectures, 2 hours laboratory a week.)*

573. Aptitude Testing I: The administration and interpretation of intelligence, aptitude and interest tests. Case history conferences. *(2 hours lecture, 2 hours laboratory a week.)*

574. Aptitude Testing II: The administration and interpretation of tests of deterioration, brain damage, and special cognitive functions. Case history conferences. *(2 hours lecture, 2 hours laboratory a week.)*

575. Personality Testing: Administration and interpretation of batteries of personality tests and inventories, with supervision. Conducting case history conferences based upon test batteries. *(2 hours lecture, 2 hours laboratory a week.)*

581. Clinical Practicum I (Counselling and Psychotherapy): Supervised counselling and therapy in hospital setting. Part of clinical internship requirement. (Prerequisites: Psychology 561, 571). *(2 hours lecture a week.)*

582. Clinical Practicum II: Structure and dynamics of the interview. Supervised practice as part of clinical internship requirement. (Prerequisites: Psychology 561, 571). *(2 hours a week.)*

583. Clinical Diagnosis: The principles of diagnostic techniques; validation of diagnoses. Classification of diagnostic categories. Case history conferences. (Prerequisites: Psychology 561, 582, 571). *(2 hours lecture, 2 hours laboratory a week.)*

584. Group Psychotherapy Practicum: Personal experience as a participant in a continuing series of group sessions conducted by a professional group psychotherapist. Theories of group psychotherapy including family, married couples and marathon groups, screening procedures and research methods. *(2 hours a week.)*

585. Perceptual and Learning Disorders: A critical review of the literature dealing with the effect of mental subnormality, emotional disturbance, minimal brain dysfunction, and gross central nervous system pathology on perception and learning. (Prerequisite: Psychology 333). *(2 hours a week.)*

586. Behavioural Therapy: Theories of behavioural modification including Mowrer & Glasser, Wolpe, Stampfl. Operant techniques applied to problems of behavioural change. *(2 hours a week.)*

588. Ethical and Professional Problems in Psychological Practice: The code of ethics for the professional psychologist; special problems in clinical practice. *(2 hours a week; one semester.)*

590. Industrial Psychology: Discussion of basic psychological principles of behaviour, personnel selection, training, safety, limits of human performance, optimum man-machine systems etc. *(2 hours a week.)*

591. Group Dynamics in Industry: Discussion of principles of human organization in industry, cooperation, competition, team work etc. *(2 hours a week.)*

592a,b. Psychology of Communication Processes: Discussion of basic principles of human behaviour in verbal communication, controls of behaviour and man's information processing capacity. *(2 hours a week.)*

GRADUATE STUDENTS MUST ATTEND RESEARCH SEMINARS.

Undergraduate honours courses, which may be assigned at the discretion of the Department Head to form part or all of the requirements of the first year of the two year graduate program, may be found in the General Calendar.

SOCIOLOGY AND ANTHROPOLOGY

Professor: *R. A. Helling, Ph.D. (Head of the Department).

Associate Professors: D. Gulyas, Ph.D.
W. Y. Wassef, Ph.D.

Assistant Professor: W. Isajiw, Ph.D. (Acting Head of the Department).

I. THE MASTER OF ARTS DEGREE

At the graduate level, students in the Department of Sociology and Anthropology will be expected to specialize in Sociology. Within this discipline, there is emphasis on communication, sociology of religion, social organization and inter-group relations.

The graduate credit courses do not necessarily cover all of the material required for the comprehensive oral examination, a necessary condition for the successful completion of the Master's programme. All candidates are expected to prepare themselves for the examination under the direction of the Graduate Faculty of the Department. Each graduate student will follow a course of readings recommended by his chief advisor, taking into consideration the subject of his thesis and his individual academic standing. Students who are required to take the "make-up" year, will start their course of readings during that year. A student with a Bachelor's degree with at least B standing in the final year and in the major subject, may be admitted to the two year Master's programme.

II. PARTICULAR REQUIREMENTS

1. A thesis on some research subject approved by the Department.

2. A comprehensive oral examination in sociological theory, in methodology and two other fields chosen from the following:

   a. social organization including complex organizations, social stratification, community structure, industrial sociology

   b. sociology of religion

   c. sociology of communication

   d. inter-group relations

   e. social psychology.

3. The completion of two or three graduate courses each with at least 66 per cent standing. The number of courses must be decided by the Department.

4. The candidate must have a reading knowledge of at least one language other than English. The language shall be chosen in consultation with the chief advisor. A student who desires to select inter-group relations as one of the subject matters of his comprehensive oral examination, should have a working knowledge of French. The candidate must show evidence of such reading knowledge by passing an examination at the commencement of his graduate studies.

*On leave of absence.

III. DETAILS OF SUBJECTS

501. Contemporary Social Theory: A critical analysis of contemporary schools; neo-positivism, human ecology, functionalism, analytical sociology, sociology of knowledge and historical sociology.

502. Research Seminar: The research process, the use of conceptual models, empirical research methods and the interpretation of research.

503. Sociology of Communication: The study of the interaction between language, human groups and the social structure; communication in contemporary society.

504. Religion and Society: Sociological theories of religion, patterns of religious organization, questions of leadership and communication, religion and socialization, interaction between religion and other social institutions.

505. The Matrix of Modern Society: The analysis of complex and multilevel organizations, social stratification and community power structures, patterns of pluralistic society.

506. Canadian Dualism, American Pluralism and the Open Society: The study of inter-group relations of the North American Continent. Special emphasis given to French-English dualism in Canada. Problems of culture contacts on other continents.

507. Social Organization of the Canadian Indigenous Population: The study of cultural patterns of native Indians and Eskimos, the problems of transition from pre-literate to urban society.

THEOLOGY

Associate Professors: E. R. Malley, C.S.B., S.T.D.
E. J. Crowley, C.Ss.R., S.T.L., S.S.L.
D. L. Egan, C.Ss.R., S.T.L.

Assistant Professors: J. C. Hoffman, Ph.D., Th.D.
T. C. Akeley, O.G.S., Ph.D.

PARTICULAR REQUIREMENTS

In addition to the general requirements and stipulations listed on pages G-16 ff. for the Master's degree, the following requirements must be met by all candidates:

(i) At least two and not more than three graduate courses, plus a thesis. At least one graduate course must be a seminar course in theology. One course may be in a cognate field. If three courses are chosen, the third may be an honours course as approved by the department concerned.

Or:

Completion of three graduate courses, one of which must be a seminar course including a major paper upon which there shall be an oral examination. One of the graduate courses may be in a cognate field. The major paper must be in theology.

(ii) Language requirement: Reading knowledge of either French or German is required. Special arrangements, however, may be required for students concentrating in specific areas, e.g. scripture. In such cases the language shall be chosen in consultation with the Head of the Department.

DETAILS OF SUBJECTS

Course Numbers	General Areas
510.	Studies in Sacred Scripture and Biblical Theology. *(2 hours a week.)*
520.	Historical Development of the Church and its Life. *(2 hours a week.)*
530.	Contemporary Problems in Doctrinal Theology. *(2 hours a week.)*
540.	Contemporary Problems in Moral Theology. *(2 hours a week.)*
550.	The Christian Interpretation of Man and its Relationship to Contemporary Secular Anthropologies. *(2 hours a week.)*

NOTE: Courses 510, 520 and 550 only will be offered in 1967-68.

SPECIAL PROGRAM

INTERDISCIPLINARY STUDIES IN COMMUNICATIONS

This interdepartmental program of study is offered in Communication Sciences leading to a Master's degree from one of the participating departments. A student so enrolled will have Communications as a field of specialization in the discipline of his graduate studies. The object of this program is to provide the student with an opportunity and climate for interdisciplinary training and research in communications. Communication between man and man, man and machine, and machine and machine is of special interest. The areas of study include language, both natural and artificial; information and information processing by man and machine; and communication systems, both natural and artificial. During the past decade, advances in linguistic studies, psychology, physiology, electrical engineering and mathematics have led to the development of certain techniques of very wide application. This program is designed to encourage the application of these techniques to problems in communications. It will interest students who have graduated with a degree in languages, philosophy, psychology, sociology and anthropology, business administration, engineering, or the sciences.

Problems in communications are complex and their study from an interdisciplinary point of view not only gives a much better understanding of the problem itself, but provides the technique for solution that would otherwise not have been easily available. This program will require the use of scientific methods and techniques in all the problems under study. Facilities include the laboratories of the participating departments, library and a high speed computer, IBM 1620 Mk II.

Academic Regulations and Degrees:

A student must apply for admission to one of the participating departments. He will be governed by all the academic rules and regulations of the School of Graduate Studies and the particular program of studies as arranged by the student's advisor and the director of this program.

Special degrees in Communications will not be awarded.

Computer Science

If a student wishes to specialize in Computer Science, courses in Mathematics and Computer Logic will be required in addition to those listed below.

Courses:

The prerequisites to this course will be registration in the graduate school or 4th year standing (B average minimum) and permission of the department concerned. A knowledge of elementary college Mathematics (Math. 15 and Math. 22 or equivalent) will be required. Each student will be expected to take the following courses in order to bring his knowledge to a certain minimum level:

I.S.C. 500b. Interdisciplinary Seminar in Communications: A tutorial seminar required of all students. *(3 hours a week, second semester, ½ course credit.)*

E.E. 581 *or* **E.E. 583c. Information Theory:** First semester. See the listing under Electrical Engineering Department.

Psychology 592a,b. Psychology of Communication Processes: See the listing under Psychology Department.

Special Program

A student may be excused from any one or more of the three half courses above (Psychology 592a,b; E.E. 581c, 583c), if he can demonstrate his knowledge of the subject to the satisfaction of the instructor concerned.

A thesis or major paper will be required of each student as per the rules of the Department concerned.

Full Program of a Student:

The full graduate study program of a student will be worked out by his Departmental advisor and the director of Studies in Communications. The full program will include, in addition to the courses mentioned earlier, any courses, seminars, colloquia, etc., that may be required.

POSTGRADUATE AWARDS AND FINANCIAL AID

Students wishing further information on awards listed below should consult the Awards Office or the Dean of Graduate Studies (unless otherwise specified).

Fellowships:

The University offers a number of fellowships varying in value from $500 to $2500. For details consult the Head of the Department concerned.

Assistantships:

The University offers a number of assistantships varying from $1500 to $2500. For details consult the Head of the Department concerned.

Province of Ontario Graduate Fellowships:

A number of fellowships is provided by the Government of Ontario to students in the humanities, social sciences and mathematics, who plan careers in university teaching. The minimum academic qualification is the Ontario Honours Bachelor degree or its equivalent. Stipends range up to $1,500 for the fall session and $500 for the full summer session. For details consult the Dean of Graduate Studies.

Canada Council Graduate Fellowships:

These are provided in the fields of the arts, humanities and social sciences. The awards are in ten categories. The two which are of most interest to students are:

1. Pre-Master's Scholarships. Value $1500.
2. Pre-Doctor's Fellowships. Value $2000 plus allowance for necessary travel.

Candidates should apply to the Canada Council, 140 Wellington St., Ottawa, by December 1.

National Research Council Bursaries and Studentships:

These are awarded in open competition to students in the fields of Biology, Chemistry, Physics, Geology, Mathematics, Engineering and Experimental Psychology. The **Bursaries,** valued at $2,000 for twelve months, are normally awarded to the applicants who have had no postgraduate research experience. The **Studentships,** valued at $2,400 for twelve months, are awarded to applicants who have had at least one year's graduate research experience. Applicants must be Canadian citizens normally resident in Canada or foreign students who have been enrolled in a Canadian university for a minimum of twelve months at the time of application. Application should be made directly to the National Research Council in consultation with the Department concerned, before February 1. Further information may be obtained from the Awards Officer, National Research Council, Ottawa 2, Ontario, or from the appropriate Department.

Queen Elizabeth II Ontario Scholarships:

In honour of the visit of Her Majesty, Queen Elizabeth II to Ontario in July, 1959, the Government of the Province established a fund to provide annually a number of postgraduate awards in the fields of the humanities, social sciences and mathematics, to candidates nearing the completion of the Ph.D. degree.

The minimum academic requirements are two years of graduate work beyond the Ontario Honours B.A. degree or its equivalent. Preference will be given to candidates who are residents of Ontario.

Apply to the Dean of Graduate Studies before December 1.

Commonwealth Scholarship and Fellowship Plan:

Under a plan drawn up at a conference in Oxford in 1959, each participating country of the Commonwealth offers a number of scholarships to students from 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 a living allowance.

Details from the relevant government office in applicant's own country or the Director General, External Aid Office, Ottawa 4, Ontario.

Canadian Federation of University Women Junior Fellowship:

This fellowship, valued at $1,500 is open to any woman holding a degree from a Canadian University who is not over twenty-five years of age and whose domicile is in Canada. Apply to Miss Jean I. Royce, 140 Stuart St., Kingston, Ontario before February 1.

Bell Canada Centennial Fellowships:

Value: $3,500 to Fellow, $1,500 to the University. Available to Canadian citizens or permanent residents of Canada. Field of study unrestricted but preference given to subject areas relevant to the scientific, political, social or economic needs of Canada. Tenable at a Canadian university or college which is a member of, or affiliated with a member of, the Association of Universities and Colleges of Canada.

For further information write to the Director of Awards, AUCC, 151 Slater Street, Ottawa 4, Ontario.

H. J. Heinz Company of Canada Ltd. Scholarship:

Value: $1,250. Awarded annually to an outstanding Canadian student entering the first year of the Master of Business Administration program.

Chrysler Canada Ltd. Scholarship:

Value: $1,500. Awarded annually to an outstanding graduate student entering the first year of the Master of Business Administration program.

Hiram Walker and Sons Ltd. Scholarship:

Value: $1,250. Awarded to a graduate student entering the first year of the Master of Business Administration program.

The British American Oil Company Limited Graduate Fellowships:

Five graduate fellowships awarded annually in any field of study. Each fellowship has a value of $4,000, $3,000 of which is to be paid to the successful candidate and $1,000 placed to the credit of the department in which the Fellow is registered. The fellowships, which may be renewed, are open to residents of Canada who are graduates of Canadian universities or colleges which are members, or affiliated with members, of the Association of Universities and Colleges of Canada, and are tenable only at universities in this category. Further information and application forms should be requested from the Director of Awards, Canadian Universities Foundation, 75 Albert Street, Ottawa 4, Ontario. Completed applications in quadruplicate are to be sent directly to the above address, to arrive no later than March 1.

British American Oil Company Limited Canadian-American Graduate Research Fellowship:

Value: $500. Awarded annually to a student registered in the final year of the M.A. program for research into problems of Canadian-American Studies. Applications may be obtained from the Department of History, and must be submitted to the Director of the Canadian-American Relations Seminar.

Detroit Edison Company Canadian-American Graduate Research Fellowship:

Value: $500. Awarded annually to a student registered in the final year of the Master's program for research into problems of Canadian-American Studies. Applications may be obtained from the Department of History, and must be submitted to the Director of the Canadian-American Relations Seminar.

Imperial Oil Graduate Research Fellowship:

The Imperial Oil Limited offers annually five research fellowships of $2,500 per year in Canadian funds for a period up to three academic years. Three fellowships are offered in the fields of pure and applied science including mathematics, and two are offered in the social sciences and humanities. These are open to graduates of any approved university in Canada and may be held at any university, approved by the donor, for graduate studies leading to a Doctor's degree.

Students who wish to be recommended by the University should apply to the Secretary of the Committee on Student Awards not later than February 15 so that the formal application may be submitted before March 1.

Consolidated Mining and Smelting Company of Canada Ltd. Graduate Research Fellowships:

These fellowships of $2,200 are offered annually to Canadian citizens for research at Canadian universities toward a post-graduate degree in pure or applied science or agriculture bearing some relationship to the broad technical interests of the Company in the fields of mining, geology, metallurgy, chemistry, chemical engineering, physics, agriculture, and electrical, mechanical and civil engineering.

Ten fellowships are offered — five tenable in Western Canadian universities and five in Eastern Canadian universities.

Application must be made on the approved forms and submitted to the Canadian Universities Foundation, 75 Albert St., Ottawa 4, Ontario, by February 1.

International Nickel Graduate Fellowships:

A number of fellowships of $2,500 each has been established to encourage academic research in the technical field serving Canadian metal industries and to stimulate advanced study in industrial science in Canada. The normal tenure is one year, but application may be made for renewal through second or third year. The fields of research are: chemistry or physics of metals, geology (including geophysics and geochemistry), metallurgy and mining.

Students who wish to be recommended by the University for these awards should apply to the Secretary of the Committee on Student Awards not later than January 31 so that the formal application may be submitted by February 14.

Chemcell Limited Fellowships:

Value: $2,500 annually, plus $1,000 to the University. Available to Canadian residents and graduates of a Canadian University or College which is a member, or affiliated to a member, of the Association of Universities and Colleges of Canada, for study up to three academic years in the fields of Chemistry, Engineering, Physics or Mathematics. Closing date for application is March 1.

Further information and applications may be obtained from the Director of Awards, AUCC, 151 Slater Street, Ottawa 4, Ontario.

Woodrow Wilson National Fellowships:

These fellowships, each providing a stipend of $1,800 for one year, plus tuition costs and allowances for dependents, are available to outstanding students who are either undergraduates in their final year or graduates who have not yet entered a liberal arts graduate school. The intention of all applicants must be to prepare themselves by graduate study for a career in college teaching in the natural or the social sciences or the humanities.

Since nominations must reach the officers of the Fellowship Foundation no later than October 31 for fellowships tenable in the next academic year, candidates should contact the Assistant to the Dean of Arts and Science as early as possible in the first semester.

Imperial Order Daughters of the Empire Post-graduate Scholarships

I. First War Memorial Scholarships:

Eight post-graduate scholarships, value $2,000 each, are offered to enable students to carry on studies in History, Economics, Constitutional Government, or any subject vital to the interests of the Commonwealth.

II. Second War Memorial Scholarships:

Six post-graduate scholarships, value $2,000 each, are offered to enable students to carry on studies in the humanities.

Applications for the above scholarships should be made in each case by October 15 to the I.O.D.E. War Memorial Convenor whose name and address are given on the back of the application form. Further information regarding application is included on the application form which may be obtained from the Awards Office.

III. Provincial Chapter of Ontario Post-graduate Scholarship in the Humanities:

Value: $1,000. Tenable at any Canadian university, for graduate study in the humanities. The candidate must be a Canadian citizen and must hold a degree in an Honours Course from a Canadian university.

Application must be made by April 30 to the Educational Secretary, Provincial Chapter, I.O.D.E., 168 Jackson Street West, Hamilton, Ontario, on forms obtained from the Educational Secretary.

. . . . . .

Students are invited to consult several publications which provide information regarding fellowships and scholarships open to graduates of the University of Windsor in Canada and abroad, and which are available in the Awards Office.

LOANS AND OTHER FORMS OF AID

Ontario Student Award Program:

Post-graduate students who qualify as residents of the Province of Ontario are eligible to receive both loan and grant aid under this plan. An award under this Program will be made to the extent of established need in a combination of a non-repayable grant and a Canada Student Loan. Further information and application forms may be obtained at the Awards Office of the University, or the Department of University Affairs, Suite 700, 481 University Ave., Toronto 2, Ontario.

Canada Student Loan Plan:

Post-graduate students who qualify as Canadian citizens or have landed immigrant status are eligible to obtain assistance from the Canada Student Loan Plan. Application for this aid should be made to the appropriate provincial government department. Residents of Ontario should apply through the Ontario Student Aid Program. Further information may be obtained at the Awards Office of the University, or the Department of University Affairs, Suite 700, 481 University Ave., Toronto 2, Ontario.

University of Windsor Loans:

Sincere students in serious need, who have academic promise (normally C standing or better) are eligible for loan assistance provided they have already applied for all other forms of assistance for which they are eligible. Minor loans range from $25 to $100 and must be repaid within one month. Major loans range from $101 to $500, they are usually meant to support a student for his second semester fees, and should be applied for no later than December 15. For further information consult the Awards office.

The Children of War Dead (Education Assistance) Act:

Passed on July 1, 1953, this Act provides assistance towards an education beyond secondary school level for sons and daughters of veterans whose deaths were attributable to service in World War I, World War II, the Korean operations or peace-time service. If the application is approved, the Department of Veterans Affairs will pay

(a) to the student, an allowance of $34 per month for the period during which he or she is pursuing a full time course, up to a maximum of 36 months, or four academic years;

(b) to the university, fees and other costs of tuition as described in the Act, up to a maximum of $800 per academic year.

For further details consult the local office of the DVA.

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